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EFFINGHAM HOUSE,
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An Architectural Causerie.

Basis of Contract. UNDER most building contracts, the "undertaking" is to perform certain works described by means of drawings and specification within a given period of time for a definite sum of money. Alternatively with this there is in use by some architects a system under which the undertaking is to perform such works as are described in a bill of quantities, reference being still made to drawings and specifications for the relative positions of various parts of the works, and for their quality. Which is the better system is a moot question, each having strong advocates. On behalf of the first named it is argued that, with properly prepared quantities, the estimate tendered by the builder should be an accurate estimate of the value of the whole work; that it is the intention of the building owner and of his architect that the whole building as set forth should be erected, and that it is most convenient for all parties to contract on this basis, and leads to fewest disputes. The advocates of the alternative system contend that, granted accurate quantity surveying, the result is the same in either case, but that in the event of inaccuracies, which even the most careful surveyors will occasionally be guilty of, it is only just that the quantity of work included in the quantity bill, from which the builder's estimate was prepared, should alone be executed without extra charge. This last argument would be an exceedingly powerful one but that in practice it is found to act usually in the builder's favour only. It is quite rare for a building owner, or anyone on his behalf to check against the quantities, to ascertain during the progress of the works the exact amount actually executed; while this is invariably done on the builder's behalf where proper books are kept; and the practical result of basing the contract upon the quantities is frequently the presentation on completion of a considerable bill for extras, which it is then difficult to check without great expense, without a corresponding bill of omissions. In fact, to base a contract upon quantities is almost to compel entire remeasurement during and after completion, the original priced quantities then becoming little more than a schedule of rates, the total, even though named in the contract, being well understood by both parties to it to be but an approximation to the eventual cost of the building, and the expense of remeasurement having in any case to be added. Probably it would be found that neither system was best under all circumstances. In the many cases, especially in the provinces, where no proper quantities are prepared, or where builders prepare their own, the alternative system is obviously out of the question, and in most instances of straightforward building operations, where the original quantities have been prepared by a skilled surveyor, the advantage to neither side would be sufficient to compensate for the cost and trouble of closely checking the amount of work actually done, either during construction or subsequently. On the other hand, when much variation from the plans is anticipated, or when dealing with alterations, or with treacherous foundations, or in any case when it is difficult to tell in advance how much work will actually be performed, to base the contract upon quantities, or upon schedule, is the only just plan to pursue.

G. A. T. M.

Post Office Architecture. THE key-note of all modern post office building was sounded by the First Commissioner of Works, the now almost forgotten Professor Ayrton, in 1873, when performing the official ceremony of opening that vast block opposite the old General Post Office in St. Martin's-le-Grand, which is now known by the official title of "G.P.O., West." The building was inaugurated amid a cloud of official apologetics, deprecatory of the severe criticisms to which it had been subjected by both lay and professional opinion during the course of its construction. The Department was then on its own defence, and it was considered necessary to attempt to show that the exigencies of public business necessitated a departure from accepted architectural models. Professor Ayrton undertook the task of defending the new and ugly pile as against the classic General Post Office building on the other side of the road, and he did it in bold, not to say militant, style. Architecture was nothing to him but a pile of stones and bricks and mortar, going towards providing a certain number of offices for departmental use. "I have read criticisms of the style in which this building has been designed," he said, "but it is an example of the post office order of architecture, and an admirable specimen of its class." Was the First Commissioner making an elaborate play upon words when he spoke of the "Post office order," or was it just an inevitable conjunction of phrases? At any rate, he was serious enough in his defence of the unnamed official draughtsman who designed the huge building. Since that official pronouncement we have naturally been led to expect all new post office buildings to be designed in a spirit of frank utilitarianism; nor have we been disappointed in that expectation. Indeed, all expectations have been exceeded in this direction, and succeeding First Commissioners have diligently crossed the t's and dotted the i's of their predecessors; and so we go from bad to worse. Professor Ayrton's pet, "G.P.O., West," was bad, and they made it worse in after years by building another storey on to it, but it is infinitely better than that other great barrack, completed, after seven years' unremitting labour, in 1895—the supremely unlovely, Cyclopean block called "G.P.O., East." From first to last something like £600,000 was spent upon site and building, and it might well have been supposed that a structure of so costly a nature, and of such national importance would have been designed in a manner worthy of its cost, site, and use. Unhappily, these considerations have not weighed in the least with Her Majesty's Office of Works, and it needs only for the reader of these lines to examine the place, to arrive at the conclusion that for elaborate meanness and coarse workmanship it would be difficult to match. The acme of bad designing is seen in the shapeless, squalid courtyard, designed for the admission of light and air, but failing in the object; while, for decoration, let the passing architectural student glance at the carved keystone masks of the entrance archways, "ornamented" with portrait-heads of departed Postmasters General. In short, the veriest city warehouse is nowadays more likely to be a building with some pretensions to architectural art than any Government building of the Middle or Late Victorian periods.

C. G. H.

THE CASTLE ARCH, GUILDFORD. DRAWN BY SYDNEY NEWCOMBE. (*See p.* 3.)

Incomplete London.

There is nothing, perhaps, more striking to a foreigner or a casual visitor in London than its incomplete arrangements in many parts, its patches of unfinished ornament, its spaces without any central object, its arches without groups, and pedestals without heroes. Hyde Park Corner is a case in point. Here, some years ago, there was an effective group of buildings; two leafy parks, the colonnade, Apsley House, St. George's Hospital, and above all Wellington towering, grim and colossal, over an arch of triumph. Two lines of traffic crossed here, and caused the usual stoppages; to give relief, it was resolved to round off the corner of the Green Park and alter the position of the arch. The modelling of the horse was much objected to; so were the Duke's cocked hat and cloak, so horse and man were taken down and removed to Aldershot, the arch was set back, and a new statue was put up in the midst of the large space thus created. The result was startling. All the buildings seemed to have been removed to a distance, the inevitable consequence of altering the position of the arch and denuding it of its equestrian figure. The arch stands beside the main line of traffic to Victoria, instead of facing it, and is placed at an angle of the "Corner," a position without a parallel for absurdity in the world; its effect is completely lost. So dwarfing, and even obliterating, is an open space to objects not proportioned to it, that the new Wellington statue attracts no attention; the enormous stream of vehicles and pedestrians surges round it, but if removed to Aldershot like its predecessor, the public would not notice the change. A far larger and more commanding group was required for the central object of so extended a clearing. And, curious as the position of the arch now is, it is rendered worse by its incomplete character; it loudly calls for a bold group of statuary to crown it. Will it ever receive it? Another structure also demands completion here; this is the screen and gateway forming the entrance to Hyde Park. It was designed by Decimus Burton, and is an excellent example of a light, open colonnade with three arches for traffic, marking the entrance without hiding the trees and space within; in short it is "garden architecture," where artificial and natural features are pleasantly contrasted. But it has, nevertheless, an unfinished air; three groups are required here, of moderate size, proportioned to the structure. Attempts at improvement have been many of late years in London, but all are more or less marred by a separation of use and beauty. The Regent's Circus, Piccadilly, illustrates this: formerly it was a circus, now it is not; a much needed street was opened in Shaftesbury Avenue, but the new buildings and the old do not harmonise; care should have been taken to replace the old grouping of structures by a new one, but here "every man has had his will, and nobody his way," and the result, though "handsome" in the modern sense, is confused and disconnected. Passing eastwards, we find at either end of Blackfriars Bridge, four immense pedestals, palpably intended for statuary. Upon one of these some time since was placed a large equestrian model in plaster of Francis I. of France, in all the bravery of the sixteenth century, equipped as for a tournament. After a time it disappeared, and why he should have been chosen to decorate a London thoroughfare none can say. Statuary is too much neglected as a detail of architecture; money is squandered upon buildings but grudged for sculpture, yet Wren declared that used in this way there was nothing more effective.

J. C. P.

On Reflection.

Le Castel Berenger.

"Le Castel Bérenger" is the name given by M. Hector Guimard to the curious structure which he has designed for Madame Fournier. It may be considered a sign of the times, and perhaps portends an architectural revolution in Paris. Singularly enough, it is placed in Passy, an old suburban quarter where "villas" abound—not the endless lines of monotonous little bay-windowed houses now incorrectly so styled, but more resembling our older detached and gardened residences, such as those still left by the Great Central Railway in St. John's Wood. Like, yet unlike, for the revived Tudor and Elizabethan villas of that pretty neighbourhood are of brick and stucco; those of Passy are of light Creil stone. But more noticeable, perhaps, is the contrast in style; severity, coldness even, is the note of the French outline, with marked symmetry in design. The Mansard roof, though effective, gives rather a pompous air to a small residence. Until the great development of steel and iron construction in the last few years, and the raising of buildings to a great height, there was nothing more noticeable about French architecture than its conservatism. Is all this about to be cast to the winds? The "Castel" is seven stories high, and resembles a block of flats. It is not only in its proportions that it varies from the regular type of French dwelling-house; the materials are quite differently disposed, and a "staircase hall" in red brick runs through a stone front *vertically*. There is much ironwork visible, as in all French designs, where, in fact, it is generally a strong point, but here again tradition is cast to the winds. Usually simple and restrained, it is in the "Castel" erratic to a degree, and conveys the idea—purposely, it would seem—of insecurity, of iron grilles being off their hinges, and of the building being about to fall. A curious sweeping flourish is carried through the ironwork, resembling now a twirl with a paint-brush, now a flying thong of a whip; the same midsummer madness runs through the interior, and extends to carpets, hatpegs, mirrors, and almost all details. France is the land of the unexpected; of long periods of submission, broken by sudden outbursts, but to certain leading principles of art she has hitherto been constant. At the Renaissance she adopted a national style which is not without grandeur, but which has the fault, perhaps, of being very strictly conventionalised. Is it to be abandoned, and with it all artistic restraint? The spoiling of Paris would be a loss to the world.

Railways and Beauty.

It is, perhaps, somewhat too hastily assumed—probably on the authority of Mr. Ruskin—that a railway is necessarily an ugly thing. There are landscapes to which, it might be contended with some reason, the cutting of a railway has given additional charm. But, however this may be, it is undoubtedly true that, in another sense, railways form one of the most potent means for ministering to our desire for and appreciation of the beautiful in Nature and in Art. Of the many thousands who, during these holiday weeks, are gaining rest, recreation, and artistic inspiration, amidst the beautiful scenes of wood and dale, mountain and moorland, how few there are who do not owe their opportunity for doing so to the despised locomotive. So, too, in regard to the works of man; the cathedrals and abbeys, the noble public buildings and picturesque cottage homes, the treasures of art galleries at home and abroad, to which we look for enjoyment and instruction, would be for most of us as inaccessible as if they were situated in another planet, were it not for the facilities for travel afforded by our railways. Whether these facilities are all they might be is another question, and with that we are not now concerned. There is a passage in one of Mr. Ruskin's books, in which he contrasts the case of the Coniston peasant of a former generation, who, wishing to reach the town of Ulverstone, would take a lovely and health-giving walk of twelve miles by lake and sea, with that of his successor to-day who makes the journey by rail, and arrives at his destination "jaded, half drunk, and otherwise demoralised, and three shillings, at least, poorer than in the morning. Of that sum, a shilling has gone for beer, threepence to a railway shareholder, threepence in coals, and eighteenpence has been spent in employing strong men in the vile mechanical work of making and driving a machine, instead of his own legs, to carry the drunken lout. The results—absolute loss and demoralisation to the poor on all sides, and iniquitous gain to the rich." The picture, though overdrawn, has no doubt a germ of truth in it as regards the Coniston peasant, but for the great majority of mankind the delights of a Lakeland ramble are only possible at the price of much of this "vile mechanical work" which, in view of its serviceableness to the majority of mankind is by no means to be regarded as ignoble.

A Competition at Blackburn.

The latest example of the peculiar ideas of building committees on the subject of architectural competitions comes from Blackburn. The Committee of the proposed Nurses' Home in that town invited plans for the new building, and appointed Mr. Alfred Culshaw, of Liverpool, to act as assessor. The assessor awarded the first premium to Messrs. Cheers and Smith, and the second to Messrs. Fairbrother and Hall, and gave his reasons for this choice in a report which the Committee have allowed to be published in a local newspaper. Instead of adopting their assessor's suggestions, the Committee have selected the plans of Messrs. Stones and Stones, and the only answer they make to the inevitable comment to which their action gives rise is that they have given full weight to the assessor's award, and that they reserved to themselves the right to select any design. As we have not seen the designs submitted, we can say nothing as to their relative merits, except that it is far more likely that a distinguished architect would choose the best design than that a body of men, presumably without professional knowledge, would do so. It is, of course, quite a usual thing for a committee to reserve to themselves the right to select a design other than that recommended by the assessor. But the appointment of a professional assessor implies an intention to be guided by his advice, unless any very special reason should arise for ignoring it. If such a reason exists in the present case, the Committee ought to make it known. To allow the publication of the assessor's report, and withhold their reasons for setting that report aside, is to allow judgment to go against themselves by default. An explanation of their action is equally due to the assessor whose advice they have treated with such scant respect; to the competing architects, who may reasonably expect to know that their designs have been fairly considered, and not capriciously passed over; and to the subscribers to the building fund, who have a right to the assurance that their money will be laid out to the best possible advantage.

GUILDFORD.

SOME HOLIDAY NOTES.

BY SYDNEY NEWCOMBE.

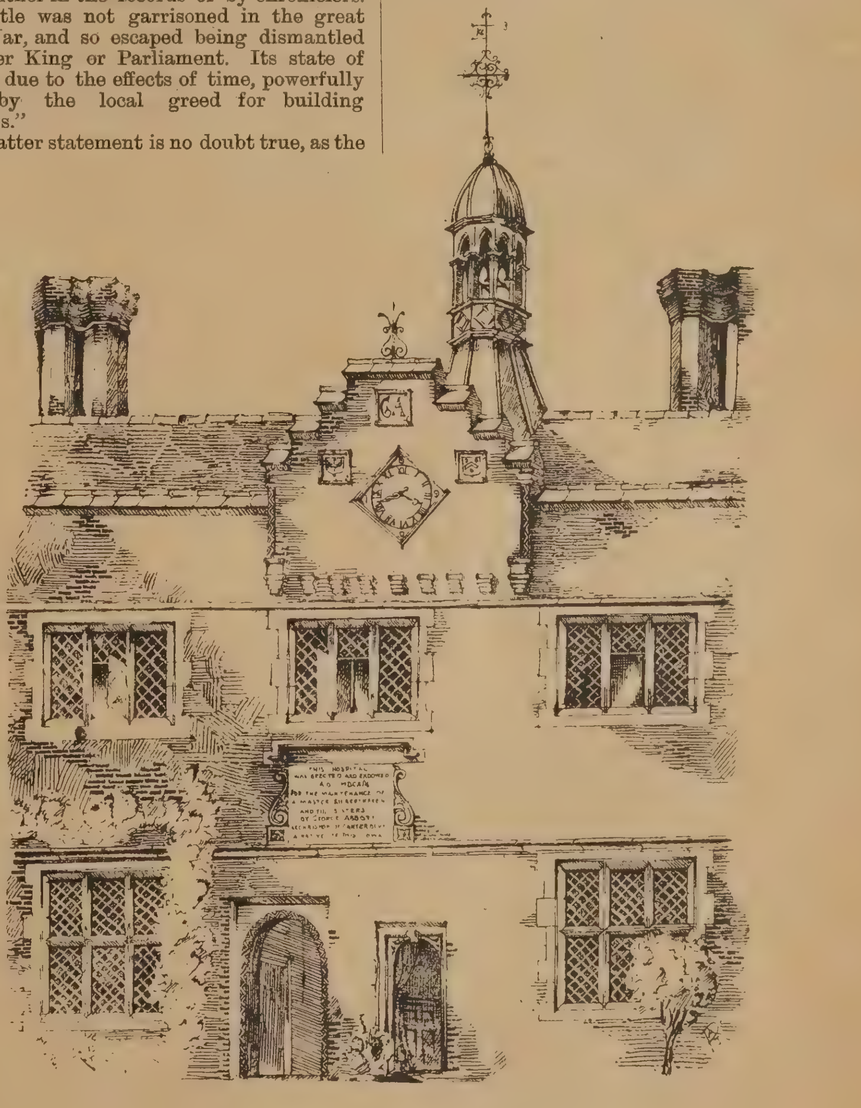
AMONG the many places of interest within a short distance of London, few can compare with Guildford, the county town of Surrey. Situated on the banks of the Wey, and in the midst of beautifully wooded scenery, its landscape appeals as much to the artist as do its quaint old buildings to the architect. It consists principally of one main street—High Street—which rises on a steep ascent from the river to an eminence from which one beholds a panorama of surrounding scenery so beautiful as to be almost beyond description. A peep down at the old town on a summer's day, with its red tile roofs and red brick chimneys, and here and there wreaths of smoke lazily rising skywards, is a sight to be remembered, and well repays the climb. To the westward rises the chalk ridge known as the Hog's Back, while to the eastward lie the Merrow Downs, and a stretch of beautiful country as far as the eye can see. To the southward, beyond the wooded slopes of Chantry Downs, is seen St. Martha's Hill, on the top of which, looking majestic in its solitude, stands St. Martha's Chapel, a Norman structure of great interest, erected on the supposed scene of some early martyrdom. The church is dedicated to St. Thomas of Canterbury and all Holy Martyrs, and was a chantry for the use of pilgrims wending their way to Canterbury. Because of its lofty situation a fire pan was fixed on the tower in days gone by to give notice of approaching danger. The church was restored and prepared for public worship in the year 1848.

In the surrounding valleys are noticed houses dotted here and there, with occasionally a spire peeping out from among the trees, while on the summit of the hill on which we stand is seen the Semaphore House. This is now a private residence, but was one of the lines of semaphores between London and Portsmouth. The land adjoining the lane which runs at the side of this house belongs to the War Department, who have constructed a fort thereon, which from its position is well situated to check the advance upon London of an enemy from the south coast of England. In the adjoining field it is said the inhabitants watched the burning of Old St. Paul's in 1666. Below us the river Wey winds serpent-like through the meadows at the foot of the hill, and on the opposite bank stands St Catherine's Hill, with its ruined chapel standing out in bold relief against the foliage of the hill behind, on top of which can be seen Booker's Tower on Guildown and the gravestones of Guildford Cemetary peeping out in strong contrast to the green turf. The charming surroundings seem to impress on one the thought that it would be preferable to be buried in Guildford than to be alive in some towns that one could mention.

Returning to the town itself, we find it dates back to Saxon times, and that in the year A.D. 900 "it was a Royal manor, and was bequeathed by King Alfred to Ethelwald, his nephew, at whose death or rebellion it again became the property of the Crown." Some authorities, however, claim it was a place of importance in Roman times, and that it was the site of Noviomagus, the chief of the Regni. The most ancient building existing at present is the old castle keep, which, with the exception of a few walls, is all that remains of the ancient building. The date of its erection is unknown. The keep is well elevated (this was necessary for its possible use as a fortress), and stands on what is probably an artificial mound. Its dimensions are about 45ft. by 47ft., and its height is 70ft. The walls are 10ft. thick in parts, and are built of ragstone flints and Roman bricks, some of the courses being in herring-bone work. The roof, it appears, was removed about 1630, as it was much decayed. There are no windows till we reach the upper floors, to which there is one large window on each side. A stone archway in the west front is claimed to have been an entrance doorway. This is at a considerable height, and must have been approached by a staircase on the outside of the wall, which is not uncommon in buildings of this class.

The old castle has been frequently visited by kings and other Royal personages. It has also served as a prison and torture chamber to others less fortunate. The town was associated with the terrible massacre of the Norman followers of Prince Alfred by Earl Godwin in 1036, many of whom were lodged in Guildford Castle. That such exciting scenes were rare in Guildford, which was essentially a town of peace, is shown by Clark in his "Mediæval Military Architecture," in which he says: "Though of great age, neither the town nor the castle has played any great part in English history. The town was never walled, the castle never stood a seige. No considerable battle was ever witnessed from its towers. No Parliament or great council was ever held within its hall. Though always a Royal manor and long maintained as a Royal residence, it was used also as a prison, and it is but rarely mentioned either in the records or by chroniclers. The castle was not garrisoned in the great Civil War, and so escaped being dismantled by either King or Parliament. Its state of decay is due to the effects of time, powerfully aided by the local greed for building materials."

This latter statement is no doubt true, as the present High Street is said to have been built of old materials taken from the castle. King Henry II. spent his Christmas in the castle in 1186; King John in 1201; King Edward in 1339; an dseveral succeeding monarchs down to the time of Queen Elizabeth have done the same. In 1611 it was granted by King James I. to Francis Carter, of Guildford, and it remained vested in his descendents until it was purchased some time back by the Duke of Norfolk, and afterwards became the property of Lord Grantley. In 1885 the site was purchased by the Guildford Corporation, who laid out the grounds and bowling green as a pleasure garden. A brass tablet erected in the grounds states that: "The site of the ancient castle of Guildford, together with the adjacent bowling green, was in the year 1885 purchased by the Town Council of the Borough of Guildford from the Right Honourable John Brinsley, Lord Grantley, for the sum of £4,490, and a further sum of £2 500 was expended in laying out the estate as public pleasure grounds. Towards this expenditure a sum of £1,000 was generously given by the Right Honourable Geo. Cubitt, M.P., for many years one of the members of Parliament for the Western Division of this County, and the balance was raised by loans contracted on security of the general district rates of the town. On Coronation Day, 28th June, 1888, the grounds were formally declared open by William Swayne, Esq., J.P., mayor, and they are dedicated to the use of the public for ever." This was a wise step, as, in addition to the natural beauty of the spot, it has been further improved by laying out the old bowling green as a terrace, and forming flower beds, a fountain, rustic bridge, and fish pond, making it a promenade of great beauty, cut off from the noise and bustle of the streets. At the Quarry Street entrance stands the old Castle archway, which formerly had a portcullis with this date, "J. C. 1669," built by John, the grandson of Francis Carter the grantee. The old house adjoining, shown in the sketch on page 1, which had been occupied by the late tenant, Miss Duncombe, for about forty years prior to her death in 1897, has been thoroughly renovated, and is now used as a museum by the Surrey Archæological Society. Needless to say, the excellent old chalk fire-place, shown in my drawing, has been retained, also the old entrance door, which has been freed of its suc-

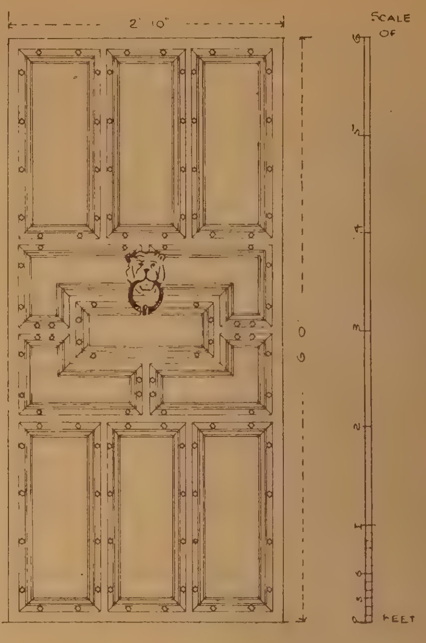


ARCHBISHOP ABBOT'S HOSPITAL, GUILDFORD.

cessive coats of paint, and prepared to withstand the decay of future years. Perhaps the most interesting building, architecturally, is the Town Hall, and the first to attract one's attention on going up the High Street because of its projecting clock, said to be one of the finest in England. The building is of brick, faced with woodwork, and was erected by subscription in the year 1683, and replaced an earlier building which stood "across the street."

The building from the first floor level overhangs the pavement and is supported by four "grotesque" brackets. The gable end is surmounted by an open hexagonal bell turret with a wooden balustrade and lead cheeks, and roof with a weather vane. The bell fixed in the turret is said to have been brought from St. Martha's Church, Chilworth, and on it the clock strikes the hours. The main front windows are of lead lights, and open on a balcony with a wrought iron balustrade. The clock, which is a very fine one, was given by Mr. John Aylward in 1683 in return for his freedom. At this time the trade of the town was strictly governed by the town Guild (Gilda Mercatoria). No one was allowed to set up in business who did not belong to the Guild. Aylward was not a member or able to purchase his freedom. So, in conjunction with his sons, he made this clock and presented it to the town, and was given the freedom of the town in return. As a proof of the workmanship it is only necessary to state the clock has gone ever since, requiring very little repair. The wrought iron stays to this clock are of excellent design and well worth sketching. They were made locally. In the building are held the Borough and Petty Sessions and County Court, and the Council Chamber is situated over the southern portion of the building, with windows opening on to the front balcony. The latter room is in oak wainscoting, and contains a fine old chimney-piece in stone, brought from an old mansion called Stoughton House, in the parish of Stoke. In this chamber is a picture of Sir Richard Onslow receiving the Dutch flag after the victory of Camperdown in 1797, painted by John Russel, R.A., a native of the town, and also a portrait of the Right Hon. Arthur Onslow, who held the office of Speaker in the House of Commons during the reign of George II. The Onslows have been closely connected with the town of Guildford, and "Speaker" Onslow received his education in the Guildford Grammar School. The walls of the hall in which the County Court is held are decorated with the town arms, and some fine pictures by Sir Peter Lely. The town possesses plate of great interest, and two maces, the smaller of which is said to be the oldest in the kingdom, its date being approximately about the middle of the fifteenth century. The Mayor's staff was presented to Guildford by Queen Elizabeth, while the Mayor's gold chain was given in 1673 by Arthur Onslow, Esq., then High Steward.

On the same side of High Street as the Town Hall, and slightly higher up stands Abbot's Hospital, a red brick building erected in 1619 by Archbishop Abbot, who was a Guildford man, educated in Guildford Grammar School. He afterwards rose to be Archbishop of Canterbury. The street front has a fine central quadrangular tower, with octagonal turrets at the corners, while at each end project gabled wings. The main entrance archway is of stone, while the massive entrance doors are of oak, panelled and decorated with the Archbishop's coat of arms. This entrance leads to the quadrangle, to the west of which are allocated the brethrens' quarters, the sisters' quarters being to the east. The founder's rules required that the inmates should be unmarried persons not less than sixty years of age. The brethren and sisters are elected by the Governors, consisting of nine officials, including the Mayor, and four non-official governors, gentlemen resident in or near the town. There are at present residing in the hospital, twelve sisters, two nurses, ten brethren, and the master of the hospital. The inmates receive eight shillings a week in addition to lodging and firing. On the north-east end of the quadrangle is situated the chapel. The two Gothic windows in this chapel contain some very fine stained glass depicting events in the lives of Jacob and Esau.



FROM OLD HOUSE, CASTLE ARCH, GUILDFORD. MEASURED AND DRAWN BY SYDNEY NEWCOMBE.

THE "ANGEL" YARD, GUILDFORD. SKETCHED BY SYDNEY NEWCOMBE.

Through the archway in the north side of the quadrangle we get to the garden, which is spacious and well kept, and doubtless sufficient for all needs. A drawing of the door in the garden front is given on page 6. Next to the chapel in this block is the dining hall, with a fine stone and wood fireplace and oak furniture. The inmates rarely use this hall now, as they partake of their meals in their own apartments. On the first floor above this room is the library. The carved oak mantelpiece, with its grotesque figures, is characteristic of the period. The panelling around the room and the furniture is of oak, and very substantial in character. The door to this apartment is very massive, as will be seen by reference to the drawing, as also is all the woodwork in this building. The master has a fine suite of apartments, and the staircase and Board room are worth seeing. There are some excellent examples of rubbed brick chimneys, reminding one of those at Hampton Court, and the lead rain-water heads are good in design. The Duke of Monmouth was lodged in the tower of the hospital while on his way to London after his defeat at Sedgemoor.

Guildford has had several charters granted it, the first and second from Henry III., and it has also had three distinct religious houses—the Dominican Friars, the Carmelites or White Friars, and the Crutched or Red Friars. Of the first establishment nothing remains to mark its site, though it was, in its time, of great importance. Of the second establishment there remain two crypts, with groined roofs supported by a circular column, one being under the Angel Hotel, High Street, and the other under a building immediately opposite; these are now used as stores. This friary was dedicated to St. Michael and All Angels, and from this the inn probably derived its name. On this spot stood the Fish Cross, erected in 1345, and in 1598 a wooden house was erected on the same spot to serve as a fish market. The Rectory House for Holy Trinity and St. Mary's parishes, once known as Poyle House, was the home of the Crutched Friars.

Of the churches, the most interesting is St. Mary's Church, situate in Quarry Street. It was probably started in the reign of King Stephen, when the tower and aisles were built by the Testard family for the use of their tenants. William the Conqueror had granted a portion of the Crown lands on the east bank of the river to the Testard family. St. Mary's Church consists of a nave with aisles and a chancel and two side chapels, dedicated to St. John the Baptist and St. Mary. In the former are several fresco drawings attributed to William of Florence, probably because he had been employed by King Henry III. to retouch the paintings in Guildford Castle. The aisles have several grotesque corbels of an early date. The church underwent a complete restoration in 1863. The Holy Trinity Church in High Street is a comparatively modern structure, replacing the old church, which had been built by a branch of the Testard family. Pepys visited this church on August 6th, 1668, and makes the following reference in his diary: "At Gilford we dined; and I showed them the hospitall there of Bishop Abbotts and his tomb in the church, which, and the rest of the tombs there, are kept mighty neat and clean with curtains before them." Owing to some repairs having been executed, and some arches and pillars removed, the structure was weakened causing the steeple to fall in with a sudden crash in 1740. Some of the old memorials were destroyed, but fortunately some were uninjured, including the monument to Archbishop Abbot. There is also a fine monument to the Right Hon. Arthur Onslow, Speaker to the House of Commons, before referred to.

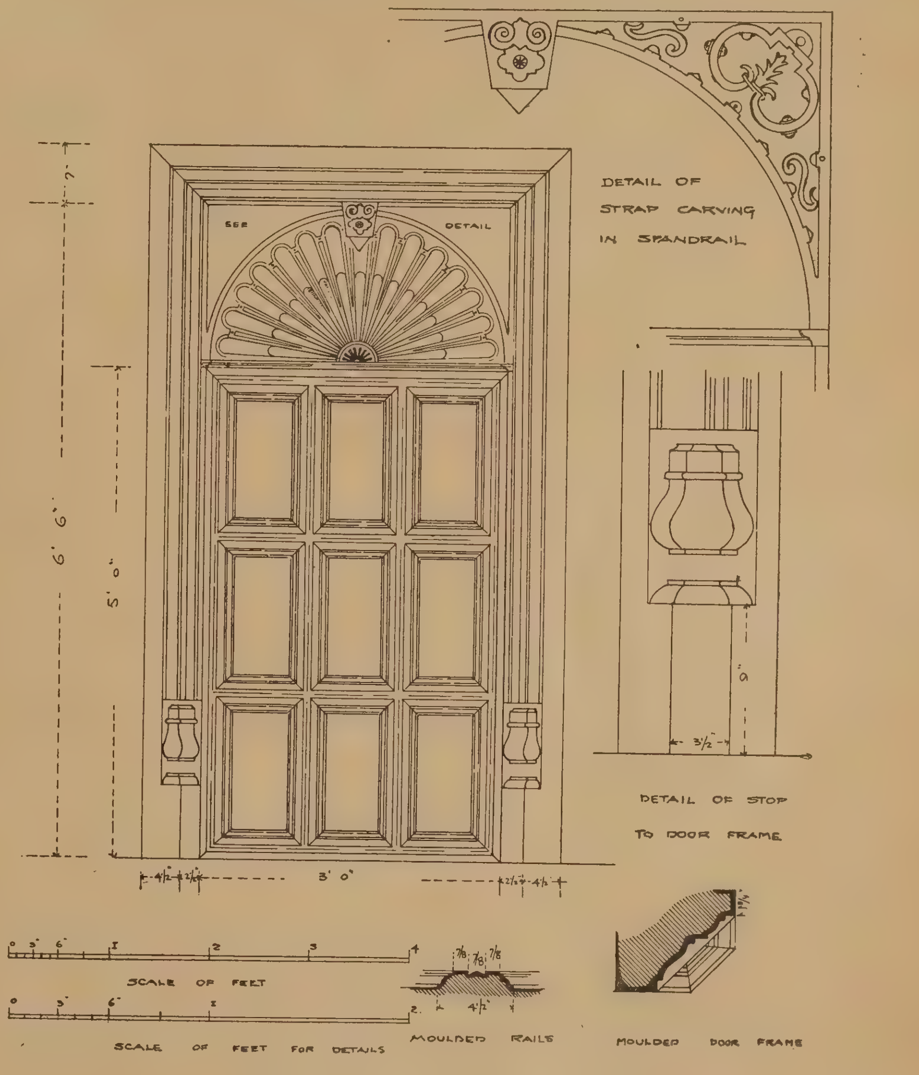
St. Nicholas Church, situate near the Town Bridge, is a modern structure built in 1875 from designs by Mr. Ewan Christian. This is the third church which has been erected on this site. There are a great number of old domestic and business premises in the town, most of which are charmingly simple and quaint in design, and shine conspicuously against the modern work which here, as in most towns, cannot compare in point of beauty with the old. There is, however, some good modern work. Two buildings at least of those I saw were far above the average work of to-day. I refer to the Hillier Almshouses in the Farnham Road, built on land given by the Earl of Onslow, from designs by Messrs. Ernest George and Peto, and Wycliffe Buildings in the Portsmouth Road, which are simple and quaint enough to remind one of Mr. Voysey's work, with overhanging eaves on wrought iron brackets and plastered dormers. There are many other buildings and items of interest to the architect and antiquarian, but for details of these and a fuller description of the beauties of the neighbourhood I cannot do better than refer the reader to the researches of Mr. G. C. Williamson, Mr. E. A. Judges, and others, to whose excellent works on the subject I am greatly indebted for much of the information contained in this article.

Cardiff New Town Hall.—At Cardiff Town Hall a Local Government Board inquiry was held respecting the application of the Cardiff Town Council for sanction to borrow a further £33,000 for the erection of a new town hall and law courts, and £3,800 for the provision of a depôt at Harrowby Street. The inquiry was conducted on behalf of the Local Government Board by Mr. W. A. Ducat. The £33,000 now applied for is an additional sum to the £200,000 borrowed under powers of the Cardiff Corporation Act of 1898 for the erection of a new town hall. The extra expenditure has been necessitated chiefly through the project to raise the height of the façade all round and the provision of sundry conveniences for the different staffs.

ROYAL ARCHÆOLOGICAL INSTITUTE.

SUMMER GATHERING AT IPSWICH.

Following the annual business meeting of the Institute, which was held, as reported in our last issue, at the Town Hall, Ipswich, on Friday, the 28th July, a paper on "Orford Castle" was read by Mr. V. B. Redstone. Many of the historical facts referred to in the paper had up to that time, said Mr. Redstone, been concealed in the archives of the county ever since the first stone of the Castle was laid. In the Pipe Rolls, he had found the whole story of its erection. After touching upon the facts that the hamlet of Sudburnham, as it was called, was in the "Honour" of Eye, and that this "Honour" was held by Thomas à Becket from 1154 to 1163, Mr. Redstone showed by means of a rough map that the reason which induced the King (Henry II.) to build Orford Castle was to provide a means of coast defence, in order to check the constant landing of hired troops from Flanders, who came over to support the Earl of Leicester, and his ally, Roger Bigod, who held in his possession all the then-existing castles of Suffolk which commanded the sea coast. This Roger Bigod is still, in these parts, Mr. Redstone maintained, the headless horseman of the untutored rustic. Between his Ipswich Castle and his castle of Framlingham, there were many lanes down which he nightly rode, according to tradition, and along which, when he was in the flesh, he did actually lead his troops of mercenaries.



ARCHBISHOP ABBOT'S HOSPITAL, GUILDFORD (A.D. 1619): DOOR IN DINING-ROOM. MEASURED AND DRAWN BY SYDNEY NEWCOMBE.

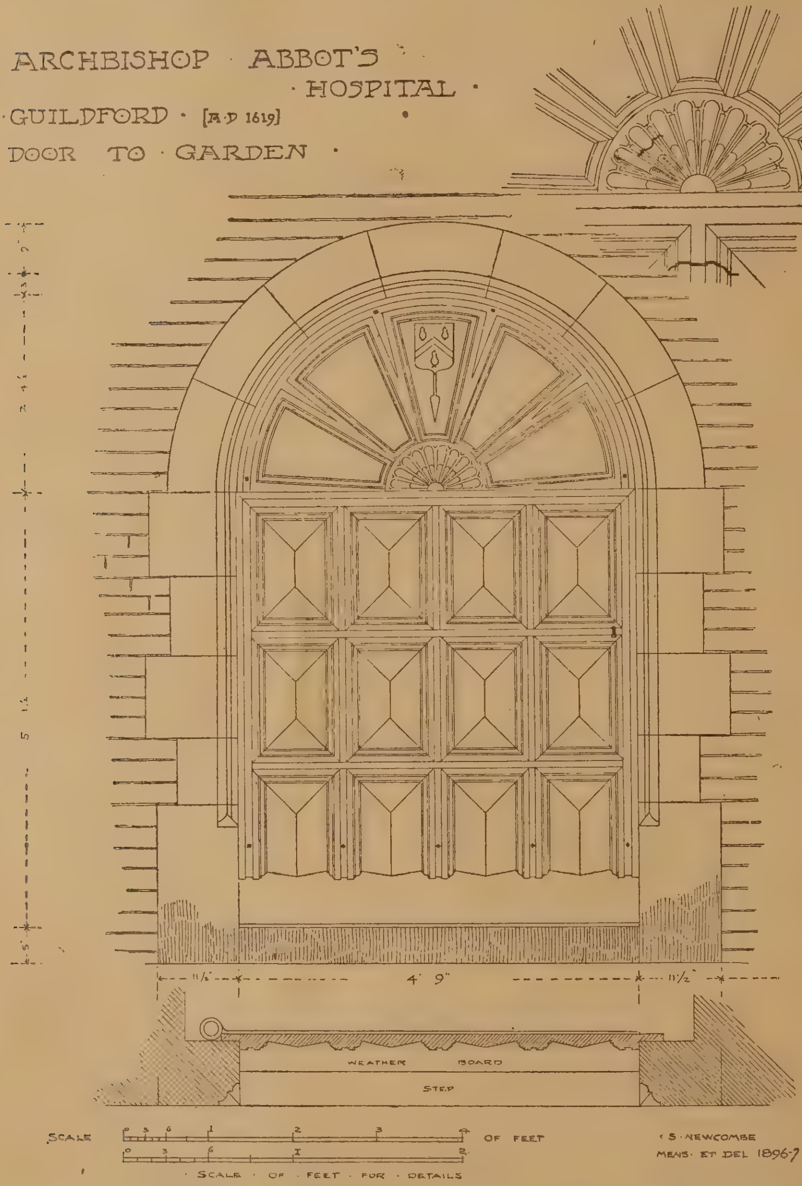
The Castle at Orford was begun in 1165. The earliest work undertaken was the construction of a road and the erection of a mill. It was obvious that a road was required to facilitate the conveyance of stones from the sea-shore and of timber from inland.

The walls were mainly built of materials furnished by the rocks of the neighbourhood, with a skin of Caen stone. The supervision of the work was given to Bartholomew Glanvil, Robert de Valeins (his son-in-law), and Wimar, the future Vicar of Orford, then chaplain. In the Pipe Rolls, Mr. Redstone found a return of the expenditure on the work, drawn up by Oger, the Steward of the "Honour" and Constable of Eye Castle. Similar accounts for the following years are preserved, and these were kept with such exactness as to show a fine of fivepence which was inflicted upon a workman for neglect or bad work. Amongst those employed were two "Normans of Ipswich." The probability was that these men were skilled surveyors, because they were called in at the commencement, when the ground was prepared as a site for the castle, and again in 1170, when a great marsh was reclaimed and made fit for the herding of sheep. This marsh and others are still known as "King's Marshes." Touching upon the tragic murder of Thomas à Becket, Mr. Redstone said that this prelate was greatly honoured and revered in the county of Suffolk. An altar was dedicated to him in most of the churches, especially in the churches of the "Honour" of Eye; that in Orford Church was so dedicated until just prior to the Reformation, when, by a mandate of Henry VIII., such veneration was ordered to be done away with.

The quarrel with Becket was brought to a close at the prelate's murder in 1170, but a storm far more dangerous to Henry's power had been gathering both at home and in France. A rebellion broke out in 1173, and the Earl of Leicester, with his wife and a large force of Flemings, landed in Norfolk, and were welcomed by Hugh Bigod, who had received the promise of extensive honours from the King of France if the rebellion should prove successful. Bigod held all the castles of Suffolk, except Orford, which was in this contingency garrisoned and put into a state of defence. A large and deep fosse was dug around; a strong kind of wattled fence, strengthened with timber, was set up between the fosse and the keep; and wooden towers were erected to protect the stone bridge thrown across the moss. The services of the Normans of Ipswich were again requisitioned to carry out this work, the total cost of which was £52 2s. 8d. A garrison of seventy-five men was placed within the castle, and provisions were collected to enable it to withstand a long siege. The purchases were recorded of 200 "seams" of wheat, according to Ipswich measure, at £21 13s. 4d., of 100 pigs at 2s. each, and 500 cheeses at 2d. each, together with iron, rope, and small cord, three hand-mills, and charcoal. The Flemings attacked the convoy guarding these provisions, but were only successful in carrying off four-fifths of the charcoal; and they also attacked the castle, but did little more than destroy the two towers, which the handy Normans repaired at a cost of about £12.

Meanwhile, Norwich Castle was safely held for the King also, whilst William, Count of Flanders, was with Bigod, now at Bungay and now at Framlingham. When Bigod saw that the contest was hopeless he made his submission to the King at Syleham. In considering the history of the castle, Mr. Redstone went on to say there was a local tradition, of which he was a little sceptical, namely, that whilst the sea had destroyed other towns on the Suffolk coast, it had deserted Orford. He could not reconcile this with the constantly repeated fact, chronicled in the Pipe Rolls, of devastations made by the inroads of the sea, and the destruction thereby of the mills belonging to the castle.

In 1336 the castle was granted to Robert de Ufford, and after that date it was no longer a fort, but was used as the residence of the Lord of the Manor. Its fortunes may be traced with those of the Uffords, the Willoughbys, and their descendants. The present owner of the castle (Mr. A. H. E. Wood), it was added, is a member of the Suffolk Institute of Archæology, and has recently responded to an appeal to place in repair a part which, if it had been allowed to fall into ruins, would have speedily caused the destruction of the whole fabric.



ARCHBISHOP ABBOT'S HOSPITAL, GUILDFORD: DOOR TO GARDEN. MEASURED AND DRAWN BY SYDNEY NEWCOMBE. (*See p. 4.*)

On the following day (Saturday) a visit was paid to the castle which formed the subject of the above paper, and further details with regard to the structure of the building were given on the spot by Mr. St. John Hope.

The keep of the Castle, it was stated, which is the one part left standing, differs from most others in shape—instead of being rectangular, with corner turrets, it is circular within and polygonal without, with three large towers or bastions stuck on round the outer circumference. The main body of the keep is divided into two storeys standing on a basement. In the basement there is a well; immediately upon entering the building the remains of what was formerly a chapel can be seen, with the stone on which the altar once stood; the first large room once formed the barracks, or the place where the soldiers lived, and the fine apartment above it was the constable's or governor's apartment.

After inspecting the castle a visit was paid to the church, where Mr. Micklethwaite, under whose directions the building is being restored, gave an interesting address. He said that when he saw the church some time ago it was practically a ruin, insomuch that it was seriously proposed to abandon it altogether, and build a new church for the use of the parishioners. Fortunately the rector opposed this idea, and sufficient money had been raised to put a roof upon the edifice and proceed with other work. He did not think that anything was known really of the origin of the church. The parish church of Sudbourne was some distance away; a town grew up around the port; no doubt it became necessary to make further accommodation, and this was done, not by creating a new parish, but by the erection of a chapel-of-ease. Mr. Micklethwaite went on to relate the history of the church, so far as it is known, and to point out the objects of special interest. With regard to the tower, which presents such a singular appearance with the upper part entirely gone, he said the people thought it was dangerous many years ago, and began to pull it down. When they found it to be such hard work, they gave the job up, but, unfortunately, they did not leave the place properly protected, and the rest of the upper part fell down in 1829.

Later in the day a visit was paid to Butley Priory, where an explanatory lecture was given by Mr. St. John Hope.

On Monday, the 31st, an excursion was made to Clare Abbey and Clare Castle; Mr. Hope again acting as guide. The church at this place, a very fine edifice, was afterwards visited. The tower is in process of restoration, under the care of Mr. Tettmar Blow, architect to the Society for the Preservation of Ancient Buildings. A descriptive statement was given by Mr. Micklethwaite; Mr. J. S. Corder, of Ipswich, in proof of the former magnificence of the church, said that Will Dowsing, of the Commonwealth period, reported that he "brake down a thousand superstitious pictures," two hundred of them with his own hand; and the Rev. Dr. Cox directed attention to the church plate, more especially to an elaborate chalice, supposed to be of Flemish workmanship, which is considered a great curiosity.

After luncheon an excursion was made, by special train, to Long Melford. From the station carriages were taken to Kentwell Hall. The old Elizabethan mansion of this name is situated not far beyond the famous church of Long Melford, and is approached from the high road through an avenue of lime trees nearly a mile in length, which is said to be the finest in all England. In regard to the house itself, Mr. J. S. Corder pointed out that the plan took the outline of three sides of a quadrangle—a style which was adopted after it became unnecessary to build fortified houses. The structure is surrounded by a moat, spanned by two bridges, while a second moat encloses the pleasure grounds, as at Helmingham. The founder of the house was Thomas Clopton, who died about 1597. Mr. Corder traced briefly the fortunes of this family, to whom Long Melford Church owes much of its grandeur.

At Long Melford Church, which was next visited, the visitors were received by the Rev. G. St. John Topham. Mr. Micklethwaite said that this was the finest church they had seen during their visit to East Anglia. It took about fifty years to build—a period which was nearly, but not quite, coincident with the last half of the fifteenth century. The church was not only built in a very grand and expensive sort of way, but furnished with equal magnificence. The Clopton Chapel was said by Mr. Micklethwaite to be one of the most remarkable that could be found in any English church.—Mr. Brabrooke, C.B., gave an account of the effigies in the windows. Some amongst them represented, he said, the old Sergeants-at-Law in their parti-coloured robes. "Sergeants" of this kind were no longer created, and almost the only pictures of what they were like in full costume were presented in these windows.

In the evening a general meeting of members was held at the Town Hall, the president, Sir Henry Howorth, in the chair. In his introductory speech, the chairman said the members of the Institute had had an excellent and most enjoyable meeting, and were very grateful for the welcome which had been extended to them by local residents. Some of them would go away with the feeling, however, that in a county so full of archæological treasures, it was a pity there should be so little genuine archæological work on the part of the gentry of the neighbourhood. They hoped very much indeed that one result of their visit to Suffolk would be to give a stimulus to such work. The Royal Archæological Society was one which inherited great traditions; their particular mission was the evangelisation of archæological inquiry, in respect to the encouragement of local societies; and he did not hesitate to point out that some changes in their methods of carrying out the work might be made with good results. He contended that it was desirable to call upon local men to give an account of buildings or other objects of interest before hearing the views of their own learned pundits, and that, disregarding the temptations to mere "picnicing," they must endeavour to maintain their reputation as a learned society.

Several new members were nominated and elected, and the remainder of the meeting was devoted to the passing of votes of thanks to various ladies and gentlemen who had helped in different ways to render the annual meetings interesting and successful.

On Tuesday, August 1st, the final excursion took place to Hadleigh and the neighbourhood. At Hadleigh Church, Rev. Dr. Cox acted as guide. Dr. Cox spoke at some length of the age of the building, as it is revealed in various features. Although the church is very large, it is not the largest in Suffolk, as was sometimes said. St. Mary's, at Bury St. Edmund's, is larger, as is also the church at Long Melford, which they had seen on the previous day. The tower and spire are 150ft. high. The spire put the Rev. Doctor in mind of that at Chesterfield Church, and he contended that spires were not sham or insecure ornaments, but legitimate elaborations of the roofs of church towers. After referring to the curiously reticulated form of the headwork of the spire, Dr. Cox said it was wonderful to note the lovely silvery grey "tone" of colour which this part of the church had assumed. Visits were next paid to Gifford's Hall and to Little Wenham, where there is a ruined church of remarkable interest. Mr. Micklethwaite said it was an almost unaltered thirteenth century church, the most interesting that they had seen during the meeting. After considerable discussion—in which the speakers were Sir H. Howorth, Chancellor Fergusson of Carlisle, Dr. Cresswell, Sir Francis Boileau, Mr. Fox, and the Rev. Mr. Bartlett, of Gloucester—a resolution was passed that a message should be sent to the clergyman, the patron of the living, and the Bishop of the Diocese, urging in respectful words that such an edifice should be maintained in decent repair. Little Wenham Hall was then visited, and declared to be no less remarkable than the church. A pleasant drive back to Ipswich brought to a close the programme of the annual meetings for 1899. The general verdict of those who took part in them was that the meetings and excursions have been this year of an exceptionally interesting character.

RIGHTS OF LIGHT AND AIR*

By T. WALTER L. EMDEN,

(*President of the Society of Architects.*)

A VERY practical work, and one of the first importance, which is being undertaken by the Society of Architects, is that of bringing about some change in the law which (without affecting the rights of property) shall prevent the vast waste of time and money, which there is every year in negotiating and litigating over questions of light and air. Every architect and surveyor knows well the annoyance which his client often suffers when proposing to erect buildings. It is no exaggeration to say that in some cases a building, the erection of which may greatly improve the surrounding property, is attacked on all sides by questions of light and air, and that a crop of ten or a dozen cases may be raised against it; many of them often of the most trivial nature, and it must be an especially lucky building owner, who commences and completes his building without any such claim being made. Almost all of these cases arise from, or are encouraged by, the uncertainty as to what does or does not constitute the legitimate rights of an adjoining owner, and I am afraid it is only the truth to say that the desire of gain largely affects the claims made. And the fear of being stayed by an injunction and the risk of large costs in fighting an action induce the building owner to pay sums of money far larger than the damage warrants. Look for an instance at what has to be faced by the latter, and it will be seen at once that the risks must often enough curtail building enterprise, and seriously impede those who legitimately wish to rebuild. Everyone seems to think that a building owner is

Fair Game for Compensation.

It is only natural that each surveyor should desire to look first to his client's interest; and the state of uncertainty as to what are, or what are not, a client's exact rights, tends to prevent a settlement and produce a lawsuit. The same thing affects the solicitors when they come on the scene, and consequently not only dò the professional costs get piled up by further expert evidence being called in, but the law's uncertainty makes litigation almost inevitable. In order therefore to protect the interests of a client an injunction is obtained, and I fail to see that the architect or solicitor can be blamed if he takes this step where the case may be of a trivial character, even if he thinks his client is likely to obtain a monetary benefit by so doing, larger than the real value of the damage. These cases, too, depend so much on

Technicalities,

while the necessity to bring home to judge and jury the facts as they are, is so great, that models and numberless plans have to be prepared, and experts at expensive rates are called in order to prove fully the views of each side to those who have to try and decide the case. What wonder is it then that these cases become enormously expensive, and thousands of pounds are every year more or less wasted in costs; this very expense is the opportunity of the man with small rights to obtain from the building owner a large sum of money, which he would rather pay than try the case with its attendant risks of costs and delays. I venture to think that no inquiry into this subject could be made, without disclosing not only the great number of these actions, but their wasteful cost and the trivial character of the majority. I am sure that every honourable professional man is desirous of avoiding this useless waste of money and of preventing blackmailing opportunities. The Council of this Society has set to work to make a determined effort in the direction of preventing this useless waste, which affects not only the public, but the honour of professional men. There is no doubt the question is a difficult one to deal with when first approached, because it is not desirable that vested interest and the rights of property should be interfered with; but it seems to me that the object which we have in view can be obtained without any such interference, and the waste which has been and is a growing evil justly and effectively prevented. In Scotland, the Court of the Dean of Guild deals with these questions, and the canny Scot is saved much annoyance and expense; and, conservative as we may be in England, there can surely be no reason why we should not adopt some similar or suitable means to accomplish the same end here. The Building Act Tribunal, in dealing with Building Act cases in London, has shown that there can be no difficulty in appointing a Technical Court to deal with these matters; and the payment of its cost would be the merest fraction of the costs to which the building owners are now put. The secret of this

Wasteful and Improper System

lies, like all other wasteful systems, in its uncertainty, and until this can be decided before commencing to build by an independent decision from a court tò which it is compulsory to go as in Scotland, the evil will grow and discredit our ability as business-like and honourable men. The suggestion which I would make, and which I think this meeting should adopt, is that a Technical Court under the London County Council in London should be established, and every building owner should be compelled to deposit a full set of the plans of any new building or material alteration of an existing building with the authority, paying such fee as may be deemed necessary, and that the authority should then require the

Owner to Give Notice

to all the adjoining owners who may be affected. Then the Tribunal or Local Authority should proceed to hear the objectors and the building owner, and, after hearing, decide as to what height, &c., the building can be carried without interference with the lights and easements of the objectors. The fact that such a decision was given before building operations were commenced and before the building owner was pledged to his contract with his builder, would of itself be a substantial boon, apart from the great saving of time and money, and the absolute prevention of blackmailing by factious and petty cases being raised. I fail to see that anyone could suffer injury by this course, and the good arising from it, I think I have shown, must undoubtedly prove a valuable saving to the public and a help to the professional man in building operations. There is no doubt that when cases are carried on men's feelings and judgment get involved and warped, and cases are carried, in consequence, to such lengths that thousands, as I have said, are spent on small and petty matters, which in themselves, taken at the very largest valuation, would not represent more than a tithe of the costs which are incurred. I in no way wish to pledge myself or the Society of Architects to the details or the exact methods by which this beneficial change should be brought about, but I suggest what seems to me a simple means, that is, an extension of the powers of

The Building Act Tribunal

in London, and by giving power to the provincial local authorities, to appoint a similar tribunal. The fees charged could be made to cover all the expense of the court and its attendant officers, and would then be moderate enough to prove a mere drop in the ocean, compared to the present wasteful process. Future discussion on this subject may devise better means, but anyway it is in my opinion, and I trust in the opinion of all those to whom I speak, necessary that the settlement of this subject should not be longer delayed, and that the remedy should be applied at an early date. The Society have presented a petition to the Lord Chancellor, and I have also laid before the London County Council a notice of motion for the Building Act Committee to consider this important question. One difficulty is that the question does not appeal directly to the great body of the public who, though they may suffer in certain ways, only suffer occasionally and for the most part indirectly; but those who build and have built will, I am sure, feel the necessity for the remedy which we advocate, and I trust they will use also their best endeavours to bring it about. I trust, too, that the efforts of leading men, both architects and surveyors, as well as those of the Legal Profession, will not be wanting in the necessary effort to bring about a reform so greatly needed, a reform which will once and for all sweep on one side the exaggeration of claims of a petty and improper character with all the attendant waste of clients' money which comes in its train, and protect more thoroughly from infringement, legitimate rights of light, air, and other easements.

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* A paper read at a meeting of the Society of Architects, held at Sheffield, on June 30th, 1899.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

RIGHTS OF LIGHT.

To the Editor of The Builders' Journal.

Hove.

Sir,—Referring to your issues of July 5th, and July 19th, re Rights of Light. Does a conservatory (with a glass panel door from a room of a dwelling house) extending the whole side of a house and half-way up, constitute an "ancient light?" There are windows at side of house. The land adjoining was purchased as building land.—Yours, &c.,

CONSERVATIVE.

The answer is in the affirmative.—H.P.B.

SURVEYORS' INSTITUTE EXAMINATION PAPERS.

To the Editor of The Builders' Journal.

Skipton.

Dear Sir,—Can any of your readers let me have a copy of this year's Students' Preliminary Surveyors' Institute examination papers? Thanking you in anticipation,—Yours truly, STUDENT.

"Student" should apply to the secretary of the Surveyors' Institute for particulars of the examination and also for the papers. Failing this, the secretary would probably furnish him with a list of this year's students, to one of whom he might write for the papers.

A SADDLE-BACK BOILER.

To the Editor of The Builders' Journal.

Burnley.

Sir,—I am about to lay down a boiler for hot-water heating, and am strongly advised to select one which, although a saddle, stands on feet, and has a firebox and return flue. The chimney is carried over the boiler so as to have the boiler enveloped from under the edges in addition to the flues. I have tried to ascertain the makers, so far unsuccessfully, and in my extremity apply to you. The one known was at Swansea, and was used by my adviser.—Yours, &c., J. R. L.

We think you would have to order specially the boiler you mention. We have never come across one at work, although they have been described to us about six or seven years ago as powerful, economical, and durable. Against these advantages had to be set the greater skill required in setting, and the need of cleaning-holes at the back feet, which latter point is not always easy to obtain in the heating chamber provided. The boiler had to project from one wall only. A similar boiler, though not as good, can be arranged by placing bricks at the corners of an ordinary saddle-boiler with a single fire flue. Such a boiler would need more frequent cleaning, as there is no pocket for the sediment to collect in. The idea is old, we believe, but we do not think it has ever been patented.—O. W.

SOLUBLE GLASS AND DELPH STONE.

To the Editor of The Builders' Journal.

Richmond.

Sir,—Can you tell me what Soluble Glass is, and where I could obtain it? Can you give me information about Delph Stone? Is it suitable for rubble or ashlar?—Yours, &c.,

T. H. S.

Soluble glass is silicate of sodium. It should be obtainable at the nearest pharmacy or drug stores; but if wanted in wholesale quantities it may be had from Wright, Layman, and Umney, Southwark Street, London, E.C. We have never come across any Delph stone (probably a local stone) so cannot say anything of its quality; but any stone that is *stone* should be suitable for rubble or ashlar work.

H. E.

PERSPECTIVES AND SPECIFICATIONS.

To the Editor of The Builders' Journal.

Manchester.

Dear Sir,—Will you kindly inform me how I can learn to ink in perspectives, and also how to learn to write a specification. I may tell you that I have taken in your valuable journal since No. 1, and I have derived a good deal of benefit from it.—Yours truly, P. C.

The information on perspectives which you require can be obtained from Middleton's "Linear Perspective," price 1s., published by B. T. Batsford, 94, High Holborn, London. For full information with regard to the preparation of specifications obtain a copy of "Specification," price 5s., published at the offices of the Builders' Journal and Architectural Record.

SOUND PROOFING ARRANGEMENT.

To the Editor of The Builders' Journal.

London, N.

Dear Sir, — Would you kindly let me know the best treatment for preventing sounds through floors of flats. I have recently erected some and pugged joists with three inches of lime and hair, but the sounds through ceilings are very apparent and objectionable; the above refers to ordinary floors. In others I have done I have used steel joists and concrete, and laid floors on 3in. by 2in. across steel joists, but you can still hear one walking across floors above; I made sure that the 6in. of concrete would have prevented this. —Yours truly, NORTH LONDON.

It is practically impossible to prevent the passage of absolutely *all* sound through floors, as the "sound" of people walking overhead consists really, in part, of vibration. It would be less noticeable if the floors were made hollow, the ceiling being thick and impervious to sound. The supporting joists should be deeper that the concrete by several inches, so that the ceiling being carried on the bottom flange would naturally leave a good non-conducting air space. G. A. T. M.

FINISHING HALF-TIMBERED WORK.

To the Editor of The Builders' Journal.

Manchester.

Sir,—I should be much obliged by your kind replies to the following questions:—(1) What would be a good and effective *black* preservative material for painting half-timbered work, which is to be of oak or pitchpine. How many coats will be required, and how applied? (2) What is the most durable white cement in the market for filling in between half-timbered work. It will require to resist the atmospheric conditions of a smoky, damp, Lancashire town? Also to retain its colour for a reasonable length of time before requiring renovating. (3) Would a rough cast filling to half-timbered work composed of one part Portland cement, to two parts sand, finished with Derbyshire spar chippings, be as effective architecturally as the usual white finish?—Yours, &c., Q.

(1) For a black preservative compound a substance generally known as tar varnish, and retailed at about 1s. per gallon, would probably meet the querist's needs. This could be applied with a rough paint brush, and to prevent a glossy finish it might be diluted as required with turpentine. For a brown tone Stockholm tar could be used, or the timber might be coated with boiled oil toned with a little burnt umber. (2) Generally speaking none of the white cements on the market are suitable for outdoor use, and the querist wil probably best gain his end by executing the rough cast in Portland cement or seleniti lime, and afterwards treating it as often a necessary with a white washable distemper "Petrifite" might, perhaps, answer the purpose. (3) There is no reason why the spa finishing to the rough cast should not give a pleasing effect when new, but its appearanc might be anything but pleasing after a year' exposure to a "damp, smoky atmosphere."—

H. E.

Correspondence.

MEMBERSHIP OF THE SOCIETY OF ARCHITECTS.

To the Editor of The Builders' Journal.

St. James' Hall, Piccadilly, London, W

Dear Sir,—The reply to your Crouch En correspondent in your last week's issue is no quite correct as to particulars of membershi in this Society.

Examinations are held twice a year, an there are four sections, the last one bein Sanitary Science, in addition to those mentioned in your paper, as per syllabus herewit —Yours faithfully,

C. McARTHUR BUTLER,

Secretary, the Society of Architects.

[Intending candidates should apply to th Secretary for a copy of the syllabus above referred to.—Ed. B.J.]

CEMENT COVERING FOR BRICK WALLS.

To the Editor of The Builders' Journal.

Sir,—The letter of your corresponde Anglice, in your issue for July 12 (p. 344 helps one to realise the truth of the poet dictum that "a *little* knowledge is a dangero thing"—italics mine. In asserting that ce tain technical terms used by me in the rep to which he takes exception, are "unknown the trade," Anglice commits the error assuming that he, or the district in which resides, is the centre of the plastering univers and that the terms and practices thereof a the only ones recognised in "the trade Several years of experience and residence in district where the technical terms employ by me are in daily use by thousands, and whe the class of work referred to is executed by t acre, enables me to speak with some degree authority, and to maintain the absolute corre ness on all points of what I wrote in the answ which has called forth the criticism.

To shed a little more light upon the poin raised, I may add that the cement covering referred to is employed primarily as a coveri for bricks of poor quality, that it is two-co work, the finishing coat being merely supe ficial—hence the "lightly-scored" renderi coat; that cheapness being necessarily an i portant factor, the proportion of cement in t rough stuff is kept as low as possible, combin with a reasonable efficiency; that the dam resisting qualities of the covering are not serious moment, provided it is as resistent wet as ordinary good stock brick work; a that appearance being the first factor, a float face is never employed, the rough gritty su face left from the float having a much mo pleasing appearance.

That such a covering as I specified will r turn driving rains in exposed situations, I a perfectly aware, and, I might add, neither c a ¾in. coat of much better material be rel upon to do so in all circumstances. H. E.

A New Lecture Hall at Fulham, wh has been erected in connection with t Primitive Methodist Chapel in Wandswo Bridge Road, was opened recently. Mr. Wray was the architect.

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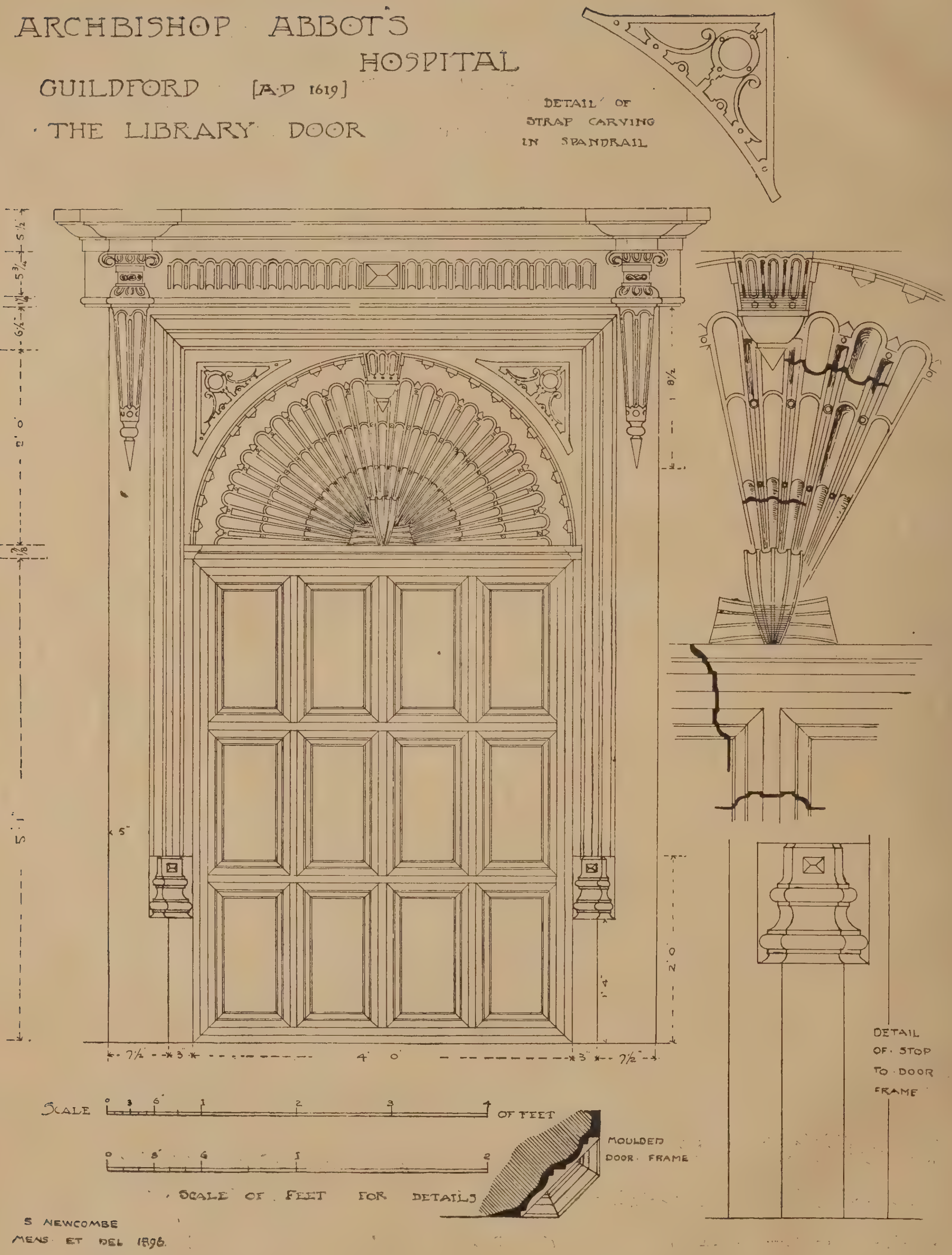
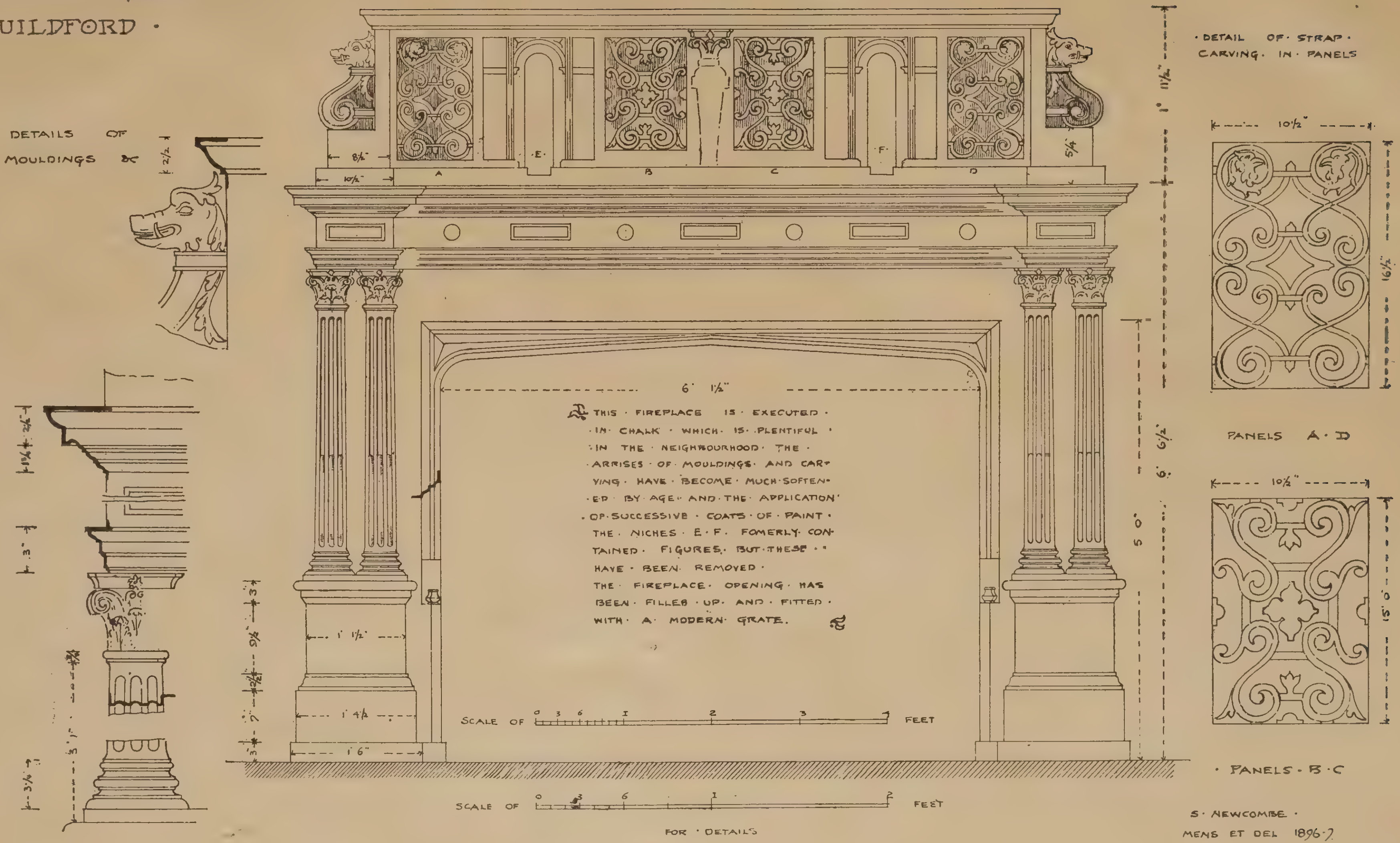
SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, WEDNESDAY, AUGUST 9, 1899.



MEASURED AND DRAWN BY SYDNEY NEWCOMBE. (*See* p. 3.)

·OLD·FIREPLACE·IN·HOUSE·
·CASTLE·ARCH··
·GUILDFORD·



DETAILS OF MOULDINGS &c
A
B
C
D
E
F
8½"
10½"
5¼"
1' 11½"
6' 6½"
5' 0"
6' 1½"
1' 1½"
1' 4½"
1' 6"
·DETAIL OF·STRAP· CARVING·IN·PANELS
10½"
16½"
15' 0"
PANELS A·D
·PANELS·B·C
SCALE OF 0 3 6 1 2 3 4 FEET
SCALE OF 0 3 6 1 2 FEET FOR·DETAILS
S·NEWCOMBE· MENS ET DEL 1896·7

THIS·FIREPLACE IS·EXECUTED· ·IN·CHALK·WHICH·IS·PLENTIFUL· ·IN THE·NEIGHBOURHOOD·THE· ·ARRISES·OF·MOULDINGS·AND CARVING·HAVE·BECOME·MUCH·SOFTENED·BY·AGE·AND·THE·APPLICATION· ·OF·SUCCESSIVE·COATS·OF·PAINT· THE·NICHES·E·F·FOMERLY·CONTAINED·FIGURES·BUT·THESE·· HAVE·BEEN·REMOVED· THE·FIREPLACE·OPENING·HAS BEEN·FILLED·UP·AND·FITTED· WITH·A·MODERN·GRATE.

MEASURED AND DRAWN BY SYDNEY NEWCOMBE. (*See* p. 3.)

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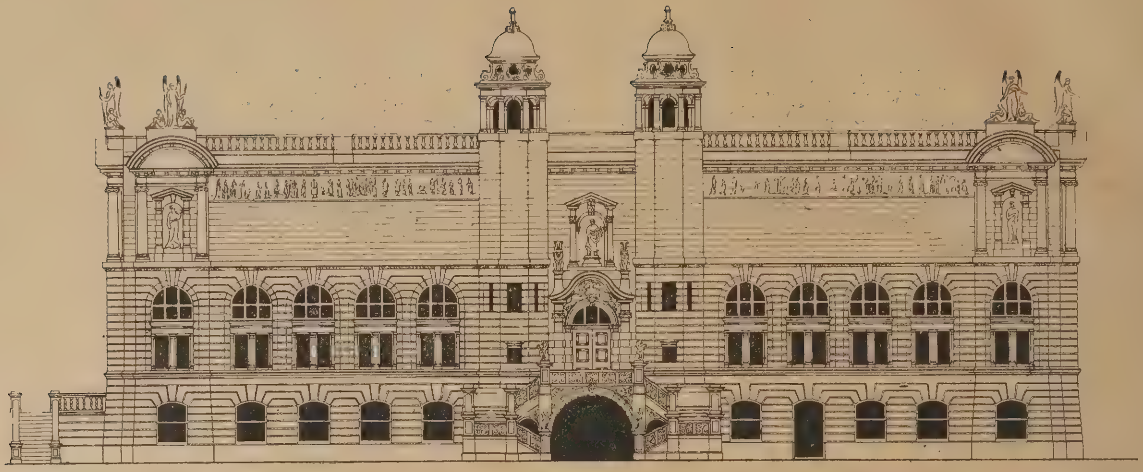
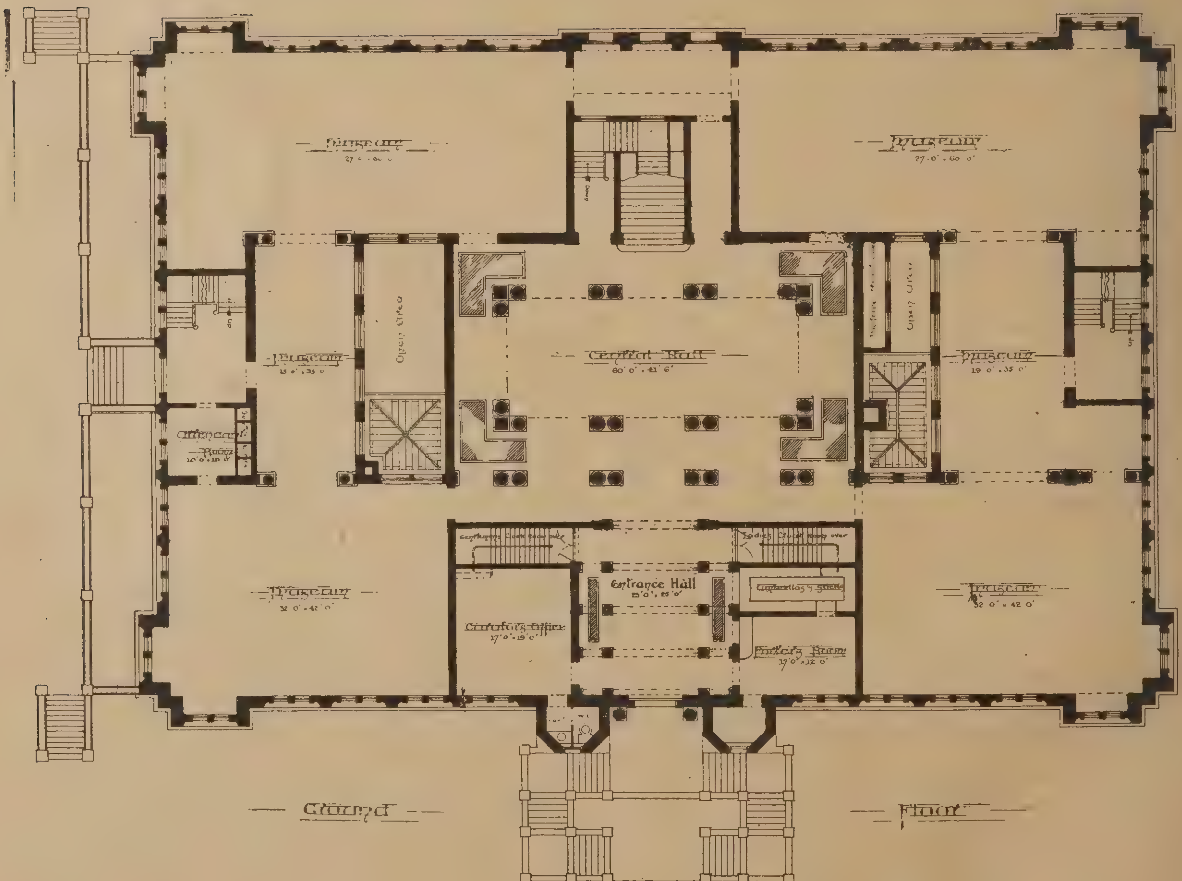
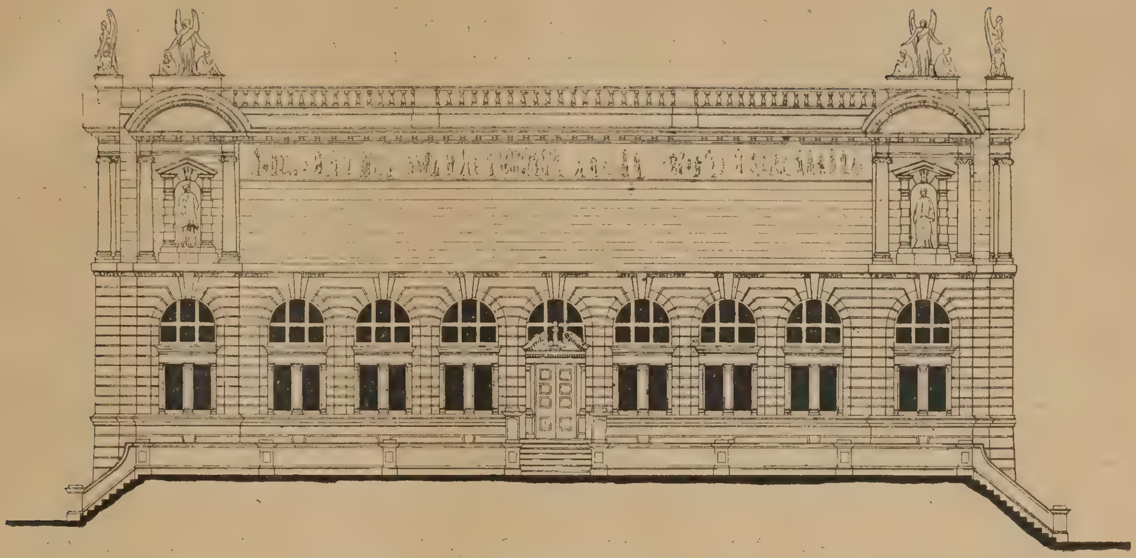


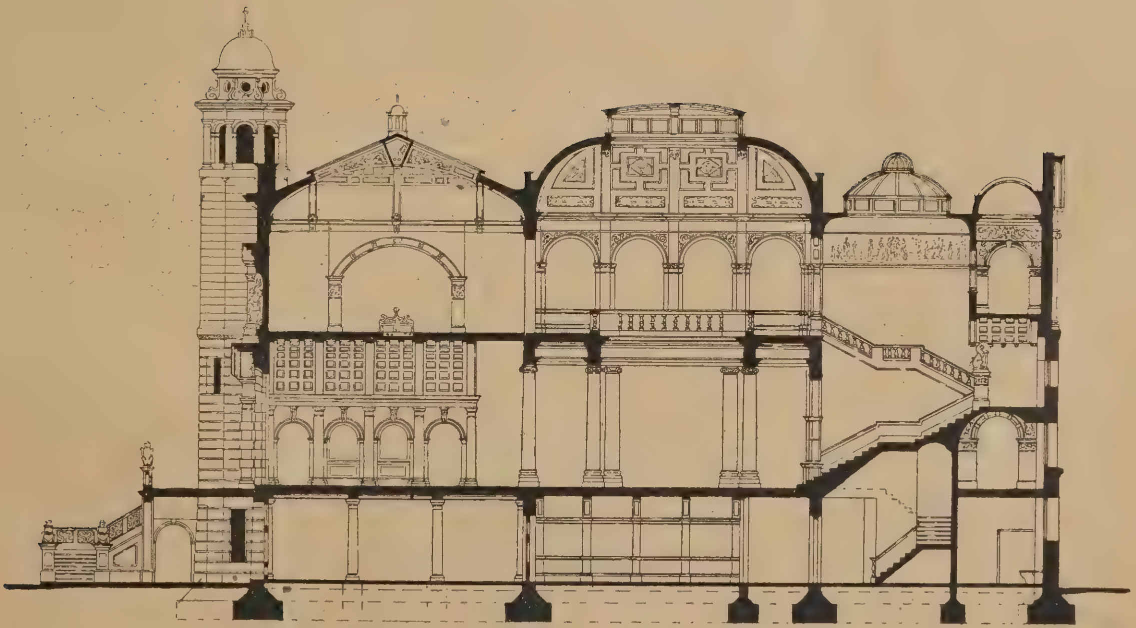
SOUTH ELEVATION.



DESIGN FOR THE CARTWRIGHT MEMORIAL HA



WEST ELEVATION.



TRANSVERSE SECTION.

, BRADFORD. Harold A. Woodington, A.R.I.B.A., Architect.

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SHOP FRONTS.*

By JAMES LOCHHEAD, A.R.I.B.A.

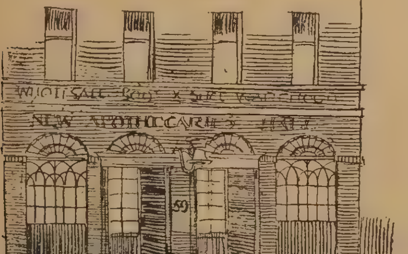
WHETHER Napoleon Buonaparte's ironical reference to us as a "nation of shopkeepers" was founded upon experience, or hearsay, or observation, the fact remains that the faculty of "buying, selling, and getting gain," has always been well developed in the British mind, and commercial interests have always maintained an important place in the progress of the country. It is therefore natural that business requirements, or more particularly for our present purpose, those special requirements which demand a "standing at the receipt of custom," should exert a strongly marked influence upon our street architecture.

By reason of the advance and multiplication of those requirements, shop building may be said to occupy a place in the study of architectural practice as important as any other, and, moreover, it occupies almost a unique position in the want of parallels in the past. Church building in the present, for instance, presents features identical with the past; modern requirements are not diametrically opposed to mediæval wants. Not so with shop building. The modern shop is to a very great extent without such parallels, and archæological researches as to the street architecture of olden times, except in a few connections which I shall discuss, serve little or no practical purpose.

It will, however, impart some interest by way of showing development, to review very generally some work of the past in the way of old time shop keeping, before proceeding with the more practical consideration of the modern solution of difficulties which did not exist for the discomfiture of architects "in the golden days."

Here let me state that *street fronts*, broadly speaking, do not come under my treatise, but, merely—I do not say "merely" in a depreciatory way—shop fronts as an integral part of street architecture.

It was invariably the custom in the olden time—by this I mean that period of which the oldest examples are on record, viz., the sixteenth and seventeenth centuries—for the owner to live over his shop, and, an Englishman's house being his castle, it followed that the house was made more important, to the comparative impoverishment of the humble, if necessary shop below. "It will be said," says Ruskin, in a tirade against the modern beatification of shops, "that much of the best decoration of the Middle Ages was in shop fronts. No; it was in house fronts, of which the shop was a part, and received its natural and consistent portion of the ornament. In those days men lived and intended to live by their shops or over them all their days. The upper stories were always the richest, and the shop was decorated chiefly about the door which belonged to the house more than to it.



NEW APOTHECARIES HALL, GLASGOW.

This relegation of the shop front to a secondary position is well shown in some of the Chester buildings and the famous Rows, where by the mere accident of encroachment, due to a mediæval laxity of building line legislation, the shop occupies an "upper floor," recessed some 8ft. from the line of street front, and thereby producing a remarkably convenient arrangement for public as well as private use, of which I shall speak later.

But public opinion superseded private taste, and no doubt the seventeenth century shopkeeper soon found that if he was to exist, his shop must be made attractive, so that from this point onward we find it at least more important than hitherto if also to a great extent less ornate.

This reticence, if you care to call it so, was due in no small measure probably to the comparative simplicity of the succeeding Renaissance, in which style, of course, new structures would be erected, while in London some early building legislation with respect to shops undoubtedly had some restraining influence, for after the Great Fire of 1666 an Act was drawn up (it is supposed by Wren) for the purpose of guiding building operations.

Some of its details are interesting not only on account of their showing that architects then had troubles on this account, but because they explain the future development, in London at least, to a certain point, which I shall illustrate.

For instance, the Act requiring "The outside of all buildings in and about the said city to be made of brick or of stone, or of brick and stone together," limits the architect in his choice of materials very considerably. One clause with respect to shops in particular, however, had a decidedly unique result. "For conveniency of shops . . . no bricks, jetties, windows, posts, or anything of like sort, shall be made or erected in any streets, lanes, or by-lanes, to extend beyond the ancient foundations, nor that any house be set further into the street than the ancient foundations, *saving only* that in the high and principal streets it shall be lawful for the inhabitants to suffer their stall boards (when their shop windows are set open) to turn over and extend 11in. and no more from the foundations of their houses into the street for the better conveniency of their shop windows." That is to say, the shop window boards might be hinged as a flap, and be turned out when the shop window was open as a stall, upon which to expose goods for sale, and, of course, to be turned in when the window was shut.

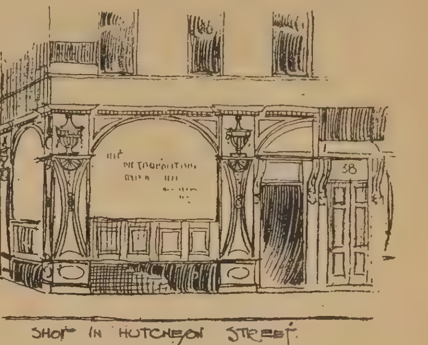
Sir Christopher's concession, however, appears to have been unduly taken advantage of, for this permitted flap came to be a fixed projecting base to the window, and the pent house shelter (which the Act had required over the footpath) became the cornice to the protruding shop front, and thus a "bulk" with foundations came to be extended over the ancient foundations.

These "bulk shops," as they were called, were in use at the end of the seventeenth century, and, not unlike the chest in the "Deserted Village" inn, the bulks "contrived a double debt to pay" by being a stall board by day, upon which the goods were displayed, and a bed by night in so far as they provided a ready couch for the "flotsam and jetsam" of Old London.

An illustration of the last of the Old London bulk shops appeared in the BUILDERS' JOURNAL for August 31st, 1898.

With the advent of the eighteenth century came a new order of things, for, although Architecture was in a kind of desolation, it was a notable time for the designing of shop fronts, and, as a counteraction to the previous regulations in the reign of George III., it was enacted that bow windows or other projections "against or before any house situate in any public street, lane, or place," should be limited to 5in. projection in lanes and 10in. in streets, a regulation which produced the well-known features of flat bow windows, some of which are still existing. Other familiar features of this period are the small windows, divided into small squares, or into various radiating arrangements of astragals, substantial piers, distinguishing signs and symbols, and appropriate signboards.

In Glasgow there are still a few examples of this era of shop fronts, and artistic evidence of the taste which characterised them exists in the premises of the New Apothecaries' Company, and others in its vicinity, which, with their quaintly shaped astragals and well-proportioned voids and solids, form quite a refreshing change from the more modern abominations in the neighbouring Trongate. The satisfactorily supported building at the corner of Glassford Street and Wilson Street, with its combination door and window, is hardly so original as the horseshoe arrangement which still exists on Hutcheson Street. Like most old examples, these possess few points for emulation in the modern shop, although, in some respects, which shall appear, we might with advantage "tak' a hint and learn."



For a long time, and until comparatively recent times, and until the improved manufacture of plate glass became known, for it is certain that the windows of a hundred years ago were limited in the size of their panes by the manufactured tables of crown glass, and that the picturesqueness of the small squares was the fitting outcome of necessity, these shop fronts underwent no great change until it was seen that the introduction of plate glass lent itself to the better display of wares.

Whether it was this supply which first produced the demand, or *vice versa*, it is hardly worth while discussing, at all events the competition between tradesmen in the display of their goods producing what Sir Walter Besant calls "the endless rows of that great and wonderful exhibition which benevolent tradesmen show gratuitously to all," soon necessitated the great business requirement of a large unobstructed surface of plate glass, for the obtaining of which, one by one, these old fronts disappeared, either to be unrecognisably transformed into the new order of things, or make way for a new building—if some of these could be called building.

It is as needless for me to dwell upon the æsthetic constructional absurdity of plate glass in this connection, or deplore the paramouncy of business interest over all æsthetics as to declaim against the absurdity of shopkeepers requiring it—they *will* have it, and they ought to know their own business. The modern shop front, therefore, has to be faced as a straightforward problem, with the chief end as *glass all over*. Certain it is, and fortunately so, that nowadays there is slightly less tendency for this all glass front, perhaps, born of a more artistic period, but the cessation of the desire has not been enough to cause a cessation of all difficulty—artistic and constructional—on the part of the architect.

As Viollet-le-Duc puts it: "What is required is a ground floor, free, as far as possible, from solid masses, piers, or walls—this is what business demands. Shops such as our times call for should present a surface entirely free, separated from the street only by glazed partitions, admitting as much light as possible."

You are all familiar with the common or garden style of thing. Glasgow is prolific in examples, and although in many cases attempts have been made to minimise the æsthetic objections, as far as circumstances and money will permit, for the most part, the whims of the shopkeeper have been realised beyond his fondest hopes.

The problem is a varied one, and it is in this versatility that the principal difficulty lies. Without doubt the worst to face is the long one-shop front at the corner of a street, with a superstructure of three or four stories, where the owner insists upon the corner being rounded off in glass, and all visible means of support eliminated. This is hardly less troublesome if it is to be divided into separate shops, with, say, entrances at intervals to the flats above. As the front narrows the difficulty lessens, 'tis true, but still the client yearns for every square inch of space, obtained by the reduction, to a dangerous extent, of all means of support. The glass must, as a rule, be in one great unobstructed sheet, as if it were some inducement to buy, further reducing the architect, who might have one forlorn hope in the decorating by some means the upper portions of the window to a state of artistic despair.

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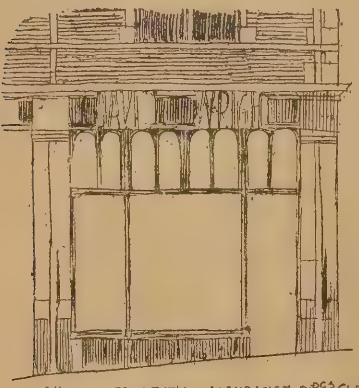
* A paper read before the Glasgow Architectural Association on February 7th, 1899.

Into the solutions of these problems of course iron must enter largely, and by reason of its very unobtrusive utility, another difficulty has to be met (which does not concern the client) in exposing its function, which our friend would fain see concealed under a cleverly arranged combination of mirrors.

I cannot say that any of these problems have been or for that part can ever be—*under the conditions I have quoted*—satisfactorily solved. But while allowing that what "cannot be cured must be endured," it remains for the architect to minimise as far as lies in his power the offensiveness of the modern shop front and assist in promoting the refinement of the tradesmen's surroundings, and as Mr. Edwin T. Hall remarked recently "raising the standard of his wares and fabrics, and indirectly of his customers."



SHOP IN PRUDENTIAL, ASSURANCE BDGS GLASGOW
ALFRED WATERHOUSE ARCHT

This is contrary to Mr. Ruskin's dictum with regard to shop fronts "that you must not mix ornament with business any more than you mix play, for," as he goes on to say "there is not a tradesman's sign nor shelf, nor counter in all the streets of all our cities which has not upon it ornaments which were invented to adorn temples and beautify kings' palaces. . . . Many a pretty beading and graceful bracket there is in wood or stucco above our grocers' and cheesemongers' and hosiers' shops. How is it that the tradesmen cannot understand that custom is to be had only by selling good tea and cheese and cloth, and that people come to them for their honesty, and their readiness, and their right wares, and not because they have Greek cornices over their windows, or their names in large gilt letters on their house fronts? . . . It is curious . . . to see the whole system of our street decoration based on the idea that people must be baited to a shop as moths to a candle."

Possibly true; but, for all that, the decoration of shop fronts for the previous reasons is not so undesirable as Mr. Ruskin makes out, and, like everything else, requires to be carried out in a reasonable spirit.

Assuming, in the first place, therefore, that things are to remain, so far as clients' desires are concerned, pretty much as they are, there still remains to be seen what can be done to make the best of it, and assist in giving as much architectural expression as possible under the circumstances; and, in the second place, assuming that clients are willing to forego a little in window space and so on, we can discuss with profit a possible solution.

The angle of a building is at all times worthy of one's study, and a shop corner especially so. Mr. Burnet has managed to obtain a solid corner at Forsyth's building in Gordon Street, and the result while adding to the architectural effect has certainly not detracted from the commercial purpose. Where this is not possible, the ingenuity of the architect is taxed with the juggling of beams of varying lengths over an iron column, or what is rare, a stone pier.

But in the case quoted, the architect has had to contend with the conditions already stated with regard to the remainder of the fronts, with the like result so far as visible support is concerned. Whereas in the case of several shops where the same conditions of minimised support are to be observed, the result is hardly so bad inasmuch as a stanchion in place of a column has to face the dividing partition, breaking up the line of front—a questionable acquisition when a "close" has to be negotiated, which introduces a most undesirable vertical strip into the composition.

Over the whole usually a continuous signboard runs, behind which obviously are the beams, supporting the building proper. It sometimes happens that stone or granite butts are permitted between the shops, in which case a part of the supporting element is certainly visible.

Mr. Waterhouse in his Prudential buildings in Renfield Street, has to a certain extent got over this by exposing his beams entirely—the skeleton sign being placed in front—making a logical and certainly truthful arrangement.

The concession regarding piers also relegates the closes to their own position by enabling them to be lowered, and at the same time assist in strengthening the appearance of the front.

As the frontage narrows down to a strip, the necessity for columns decreases, although the beam difficulty still remains. This can be got over, of course, by an arch, which must of necessity be flat, and is usually weak in appearance, giving the appearance in most cases of having a girder concealed behind, in addition to obstructing the light.

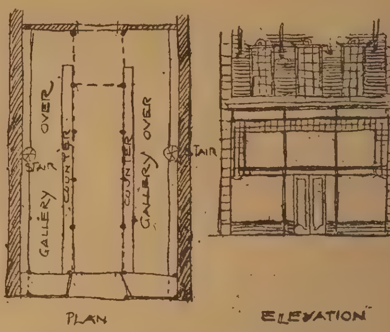
Rectangular openings admit the largest amount of light, and arched openings, especially when pointed or semi-circular limit it, and apart from the lighting power of a square-headed window, the greater facilities afforded for such fittings as blinds and shutters give it a practical advantage over an arched form.

Taking, however, "a plain, unvarnished tale" in the shape of a square-headed window-glass from sill to lintel, and assuming that the necessary evils of hidden support must be endured, a great deal cannot be done to make it less obtrusive. It is equally difficult to make it serviceable for the shopkeeper, for with the utilisation of all available space, the relegation of ventilating arrangements to an infinitesimal fret at the top, or in some cases their total omission, causes an amount of sweating which seriously interferes with the primary purpose of the glass itself.

Now if the available front must be *all* glass, it can be for no other purpose than to cause a great glitter, for so far as the display of goods is concerned, a window 8ft. or 10ft. high is ample, and the remaining space lends itself in a variety of ways to some sort of decoration, as well as providing means for ventilation and better lighting for the interior. In the Prudential example the show window proper has been ceiled at this level, a transome thrown across, and the space over divided by pilasters and arches into bays, some of which are made to open. Objection might be taken that these appear to act as supporting features, but when kept in their proper place, and receiving appropriate treatment, they need not appear to have other than decorative and convenient functions.

Mr. W. Eckstein, in a paper before the Architectural Association (published in the Builders' Journal for May 11th, 1898), threw out a valuable suggestion that this space could be well adapted for lighting the interior, and in our murky Glasgow atmosphere, the inner regions of shops are at times very dismal, which might be avoided by glazing with light prismatic glass, when an external effect as well as internal convenience could be obtained.

Numerous treatments of this space will, of course, suggest themselves, some of which might well be based upon the radiating astragal arrangement of some of the older examples.

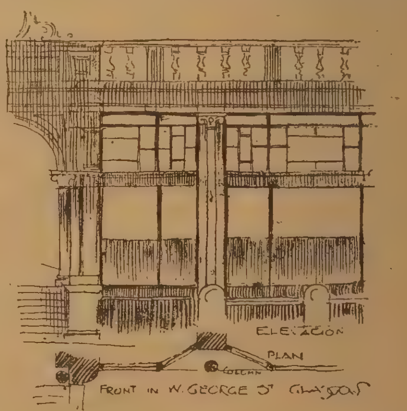


RESTAURANT IN INGRAM STREET, GLASGOW.

A useful suggestion for certain purposes is afforded by the treatment of Miss Cranston's restaurant in Ingram Street, where a high ceiling otherwise useless has been advantageously utilised by forming an entresol, the bisecting floor having been prettily emphasised by some appropriate woodwork, without interfering with the plate-glass window proper.

Now, in shops with high ceilings the goods in the higher shelves are awkward to get at, involving some dangerous feats in preserving equlibrium on the part of the assistants; a height at which goods are accessible by merely reaching, would be a great deal more convenient. For this purpose an entresol or gallery running parallel with the counter front, accessible from either end, would be more convenient; this carried right out to the window face and worked into the same, might be the means of obtaining a thoroughly logical architectural setting, as well as preserving the shopkeepers interests in the way of window display.

In some of the illustrations accompanying this paper the oriel is very prevalent, and it seems as if this is likely to become more popular with shopkeepers, as it affords more possibilities in the way of construction for the architect. I say construction advisedly, for a building in West George Street (by Mr. Gordon, I think) seems to me to afford some food for thought. Here the iron columns supporting the superstructure are exposed, and stand in front of butts, between which the windows extend in flat oriel form. If these butts were removed to give a large area of glass, the supporting column adequately strengthened, and the re-entering angles at bottom suitably protected and treated, there seems to me to be a possible solution of the difficulty, of giving some better architectural expression. The columns need not be protected, that is so far as the Building Regulations go, as their provisions for surrounding and protecting against fire "with plaster or cement, or other fire-proofing material three-quarters of an inch thick," only refer to the supports of main walls within a building.



FRONT IN W. GEORGE ST GLASGOW

(*To be concluded.*)

Bricks and Mortar.

> *"Not a hut man builds but is the visible embodiment of a thought; but bears visible record of invisible things; but is in the transcendental sense symbolical as well as real."*—
> Thomas Carlyle.

Cartwright Memorial Competition. The drawings reproduced in our centre plates were submitted by Mr. Harold A. Woodington, A.R.I.B.A., of 130, Jermyn Street, Haymarket, in the recent competition at Bradford for a memorial to take the form of a museum and art galleries, to be erected at Lister Park. The elevations were intended to be built of freestone which is very largely used in Yorkshire. The total cost was not to exceed £38,000. The principal entrance placed on the south, approached by an external staircase, is an effective feature of this quiet and dignified design.

Extending the Athenæum Club. The erection of scaffolding upon the roof of the Athenæum Club has caused many persons to wonder whether one of our best examples of classic architecture was to be spoiled by the addition of an ugly modern second storey. They need not worry on this point. The intention of the committee of the club is to provide necessary accommodation, which when Decimus Burton designed the building, was not included in the sheme of construction. The smoking room accommodation is at present very limited, and it has been deemed necessary to increase it by the addition of an attic storey. This work will be carried out with due regard to architectural fitness. The new storey will be recessed from the main walls, and only a slight glimpse of it will be obtained from the street. The Hon. John Wilson Croker was the originator of the Athenæum. He was determined that the front should be ornamented with a frieze, although some of the members were advocating the erection of an ice-house on the premises. To show them that he meant to have his own way, he had the following lines posted up in the hall:—

I'm John Wilson Croker,
I do as I please;
Instead of an ice-house,
I give you a frieze.

National Art Competition. The prize designs and other works of the students rewarded in 1899 in connection with the national competition of Schools of Art will be on view in the southern galleries at South Kensington until the end of August. The students are those of the schools under the Science and Art Department, beginning with the Royal College of Art in South Kensington. The exhibition is of about average excellence. The work done of modelling from Nature shows a falling off, and in drawing from the antique the examiners say that "the standard of work by students of the Royal College of Art is not so high as it was last year." The only recommendation the college has received is in respect of painting from the living model and designs for internal decorations and damasks. The number of works produced during the year ending with April was 53,960 from 299 schools of art and branch schools, 31,116 from 275 schools of science, and 12,454 from 454 art classes. Of all these works the number entered for national competition was 5,780, and the successful exhibits on view number 1,091. Twelve gold medals, 102 silver medals, 280 bronze medals, and 480 prizes of books were awarded to the schools and students named in the catalogue. In addition to these, honorary awards were made to free students at the Royal College of Art to the extent of five gold, thirty-six silver, and seventy-three bronze medals, and 103 book prizes, in respect of 755 works submitted for judgment. The winners of the twelve gold medals are:—Edith Olga Armour, Battersea, for designs for printed muslin; Thomas William Long, Battersea, also for a design for printed muslin; William Haywood, Birmingham, for a design for a royal mausoleum; Frank S. Eastman, Croydon, for chalk drawing figure from the nude; Lizzie St. Bell, Glasgow, for model of a figure from the nude; James Kincald, Glasgow, for design for printed hanging; Ernest H. Simpson, Leeds, for stencilled designs for the decoration of a dining-room; William J. Metcalf, Liverpool, for design for the frieze of a hall; Jennie Delahunt, Manchester, for modelled design for a ceiling; Ernest G. Gillick, Nottingham, for model of figure from the nude; Thomas Claughton, Pudsey, for modelled design for a leaden cistern-head; and Maria Thekla Pearce, West Bromwich, for oil painting from the nude figure. The recipients of honorary awards of gold medals to free students of the Royal College of Art were Mary G. Houston, George Marples, Charles J. Pibworth, and Harry G. Theaker.

Architectural Design and Drawing. The examiners in architectural design were Messrs. G. F. Bodley, A.R.A., T. G. Jackson, R.A., and Aston Webb, A.R.A. They reported that the number of works submitted for competition was larger than last year, and there were a few good designs, but, speaking generally, the level of the work was distinctly below that for several years. In many plans the lighting was not sufficiently considered. The masters would do well to set their students less ambitious subjects than those often given, such as large town halls, &c., which are quite beyond the experience of the students. Messrs. J. Belcher, T. G. Jackson, R.A., and J. J. Stevenson were the examiners in drawing from measurement. They expressed regret that the general standard of the work was lower still than that of last year. On the other hand they thought that the masters had shown greater discretion in the selection of good subjects for the students to study. With regard to full-size details of mouldings, they did not believe in the accuracy of those which were drawn with compasses. Altogether, the report is a rather depressing one, and seems to imply that the teachers have to some extent allowed their pupils to waste their time upon unprofitable and unpractical work.

Transforming the Imperial Institute. Along with the Treasury Minute issued recently was a Supplementary Estimate for £65,000 for the purchase of buildings now occupied by the Imperial Institute, and for their adaptation in part for use by the London University. The Minute is dated July 13th, and refers in general terms to the arrangements which have been made by her Majesty's Government with the governing body of the Institute respecting the whole group of buildings now in their possession. The arrangements are as follow: 1. The lease under which the buildings are held from the commissioners for the Exhibition of 1851 will be transferred to the Commissioners of Works as representing the Crown, and the Commissioners of Works will become responsible for the maintenance, rates, custody, and protection of the buildings. The Commissioners for the Exhibition of 1851 have assented to this arrangement. 2. An agreed portion of the buildings will be assigned for the use of the Institute, free of rent, but with the responsibility for internal maintenance and repairs of that portion. 3. The cost of removing the Institute from the portions of the buildings which they will surrender, including the necessary structural alterations, will be paid by Government. 4. In consideration of the transfer of the lease, the Government will provide funds sufficient to pay off the existing mortgage of £40,000 on the building, and also to discharge a floating debt of the Institute, not to exceed in all £15,000.

The London University's Premises. The following is a general description of the accommodation which the Government will be able to offer to the London University: The eastern and central portions of the main block, including the principal entrance, vestibule and staircase, and the great hall; subject to occasional use by the Institute of certain portions of the central block when not required by the University, under regulations approved by the Chancellor of the University, and subject also to certain reservations in favour of the Government of India. Also a portion of the upper floor of the inner block of building running east and west; and the temporary structure now standing in the South-Eastern Court. It has been agreed that accommodation for the practical examinations of the University in physics and chemistry shall be provided in the new buildings about to be erected for the Royal College of Science, subject to arrangement between the two bodies as to dates of use.

Trowse Newton's Dilapidated Church. It seems a pity that the quaint church in the village of Trowse Newton, which is just outside the city of Norwich, should have been allowed to fall into the state of decay it is in at present. Within and without, it is sadly in need of renovation, and, in some portions, of reconstruction. The woodwork of the interior is in many places literally rotten, and the flooring has given way, especially in some of the old-fashioned pews. The church still retains a relic of the past in the form of a "three-decker" pulpit, the ascent of which is said to be not unattended with danger. The West window is blocked with an unsightly gallery, wherein probably in past times the singers, the fiddlers, and the flautist, led the congregational psalmody. There are many interesting features in Trowse Church; the font, for instance, with its quaint but mutilated old sculptures; also the well-preserved brasses dating from the sixteenth century. The ancient history of the church is told in its varied architectural features. Outside the chancel to the North of the East window is a niche, in which once stood a statue of St. Andrew the Apostle, to whom the building is dedicated. An inscription beneath records that the figure was given by a Prior of Norwich in the thirteenth century. The present vicar, the Rev. W. H. Macnaughten-Jones, is very anxious to effect an improvement, and, with the sanction of the Bishop, has issued an appeal for £2,000.

Bishop Westcott on Art. A missionary fresco has been painted by Mr. J. Eadie Reid in the apse of St. Columba's Church, Cornhill, Sunderland. In the centre of the picture is the River Wear, which the artist has endeavoured to depict as it appeared in the days of the Ven. Bede. On either side are grouped the figures of those most prominent in the conversion of England; at the head of the first or northern group is St. Columba, representing the Celtic influence, while the other is led by St. Gregory, as the head of the Italian mission. Above these figures is to be placed a representation of Christ in glory, on whom they are all gazing. At a special service in St. Columba's on Saturday evening the fresco was formally unveiled by the Lord Bishop of Durham (Dr. Westcott). After unveiling the fresco the Bishop delivered an address, in the course of which he said that, like the poet, the artist had a prophetic gift. The beauty he portrayed was simply his discovery and not his creation. But the pursuit of Art was beset with the greatest difficulties. It was easier to limit his powers than to use them rightly, and therefore fulness of culture should be his aim, even though in the end he might be forced to acquiesce in an incomplete attainment. If, however, Art once looked for an end to itself, it passed to idolatory. It was only the corruption of Art which tempted them to think of pictures as garniture and household stuff—the appendages of luxury and pride. He thought it was nothing to wonder at that the progress of imitative Art had been slow, considering the nature of its task. Its appeal was to the senses through which the most universal perils came to the moral life. The progress of the social arts—music and architecture—had been greater. Christians, fortunately, had from the first an insight of what painting and sculpture should be. Art helped to bring back to us the sense of the divine in the field, in the workshop, and in the great course of life. The works of the artist were the books of the unlearned; nay, the books of the wisest to be pondered upon.

Modern Babylon.

An attempt to revive on a modest scale the hanging gardens of Babylon is on foot in Paris at present. M. Tabary, a well known French architect, is the chief mover in the matter. At the corner of the Avenue de Suffren and the Boulevard Garibaldi, he has built two six storey houses and planted charming triple-terrace gardens on the top of them. The extent of this aerial floral paradise is 400 square yards. For the support of the gardens he has only found it necessary to strengthen the uppermost storey with ordinary iron girders and supports. The solidity of the houses is not affected by the additional weight. Cement is laid on the topmost ceiling and then a bed of fine sand, over which are several thicknesses of a sort of coarse blotting-paper, then another layer of sand and cement. Upon this is laid the mould for the garden, and the bed is sloped so as to allow water to drain off it by the ordinary pipes of the house. M. Tabary's idea has been adopted by other architects, among them Mr. Gustave Rives. The Automobile Club, which is housed in the building opposite the Admiralty in the Place de la Concorde, has been adapted by him for a "hanging garden." On the flat Italian roof of that splendid house he has created a little park, with a pretty lawn and a fountain. The idea of roof gardens is not without an advocate in London. Mr. Wyndham, if the London County Council will let him, intends to have a roof-garden on his new theatre in the Charing Cross Road. Mr. W. G. R. Sprague is the architect of the theatre, and has designed what is practically a large and handsome conservatory of iron and glass on the roof of the theatre. It will be cut off from the theatre by a fireproof flat, and will be accessible (but only to the stalls, circle, and boxes) by a lift in which a dozen people can travel at a time.

The Proposed Cromwell Statue.

Mr. Lucas Shadwell, the member for Hastings, presented, on Tuesday last week, the following petition to the House of Commons:—"Whereas Oliver Cromwell deprived the people of this realm of Parliamentary institutions, and compassed the death of their King, and persecuted and destroyed their Church, and set himself up as the head of that most detestable form of government, a military despotism, we, your petitioners, consider him unfit to be honoured by the erection of a statue on public land, especially as, by so doing, a deliberate insult is offered in particular to that portion of the United Kingdom called Ireland, where the said Oliver Cromwell's butcheries and cruelties caused the most terrible sufferings amongst its unfortunate people, and created evils which have not yet been obliterated. Your petitioners therefore pray that your honourable House will be pleased to refuse permission for the erection of a statue to Oliver Cromwell on public land." Another member of the House, Mr. Lowther, suggested the other day that a suitable place for the proposed statue would be the Chamber of Horrors at Madame Tussaud's. It is not likely, however, that these and similar vapourings will prevent the erection of a fitting memorial to one of the greatest of Englishmen. The gift of the statue was accepted and a site granted by the late Government, and the present Government have ratified the arrangement, which will undoubtedly be carried out.

A Secret Dungeon Discovered at the Tower.

During the building of the new guard-room in the inner bailey of the Tower of London, the interesting discovery of a secret dungeon has been made. The new guard-room is situated between the Bloody Tower and the White Tower, and in preparing its foundations, a subterranean passage was discovered (or, to be accurate, re-discovered, for its existence was known), extending from the moat, near the Traitor's Gate, beneath St. Thomas's Tower, in the direction of the White Tower. The passage is lined throughout with Norman masonry and has a level floor. It runs straight from the moat into a dungeon which is completely isolated from all parts of the fortress, and has communication with the upper air by a shaft which descends into the passage. Several objects of interest were found in the dungeon. These consist mainly of masses of potsherds, amid which are fragments of green-glazed ware such as was common throughout the Middle Ages; several broken brown jugs, known as bellarmines, and pieces of coloured delft and Fulham ware—all no doubt fragments of the broken utensils of the garrison, thrown down the shaft after the dungeon had ceased to be used, in Elizabethan times and later. A number of stone and iron cannon shot were also found. One of the most interesting finds was a mass of Roman cement, in which are embedded three of the well-known tiles with which the Roman builders banded their walls. The bottom of the subterranean passage is 17ft. beneath the level of the ground, and the shaft by which access to it is gained descends straight into it. Towards the moat the passage was closed by a strong iron grille firmly embedded in the masonry; at its other end is the dungeon, a horrible black cell, oval in shape, originally vaulted, and measuring about 7ft. across.

The "Vandalism" at St. Dunstan.

In last Wednesday's issue of the "City Press" Mr. Allen S. Walker, of Hampstead, laments the various misfortunes which have befallen the parish of St. Dunstan-in-the-West. He writes: "One cannot help being struck with the singular misfortune which seems to be continually attending the parish of St. Dunstan-in-the-West. In and about 1831 the parish was greatly purturbed at the vandalism which tore down its ancient church and erected a 'Revived Gothic' in its place. In 1878 the parish lost Wren's graceful gate of Temple Bar, and afterwards received in place of it the very doubtful Griffin, which leers threateningly upon all who dare to enter the City from the westward. That interesting Jacobean building, 17, Fleet Street, with its royal history and finely-moulded ceiling, has been announced to disappear almost immediately, and, in fact, the parish bids fair to be left without any features of historic or architectural interest. When the present 'Revived Gothic' church displaced the ancient St. Dunstan's, it had two only redeeming features—the one its decidedly stately and graceful tower, and the other a statue of Queen Elizabeth, formerly standing on the gate of Ludgate. Now, in this year of grace, 1899, to complete its annals of unfortunate loss, the parish is threatened with the practical spoliation of these two redeeming features of its church. As surely as the offices on the west of the tower are extended as proposed, so surely will the whole effect of the tower be disfigured. If, at any future time, the intended rectory is built to restore the balance on the east of the tower, then the statue of the Virgin Queen will cease to be a feature of Fleet Street, and the tower, whose stateliness depends upon its isolation and projection from the adjacent buildings, will be finally ruined."

Ranworth Church.

The old church of Ranworth, Norfolk, requires renovating very much. It is a fourteenth century building of somewhat ordinary type, but once possessed a roof of timber richly carved and gilt, which was taken down in 1811 and replaced by a very inferior covering. The great glory of the church is its rood screen, and funds are required for its proper maintenance. It is a very fine example of the school of decorative painting which flourished in the eastern countries during the fifteenth century. The work was very probably done by travelling artists from the Lower Rhine and the Netherlands, although there are traces of local influence. The faces of the Apostles and Saints have, unfortunately, been almost obliterated, though enough remains to give an idea of the dignity and grace they once displayed, even if there was not such an example as the head of St. Jude in the neighbouring church of Cawston to refer to. The rich ornament on the robes of the figures is still in excellent preservation, and is of the highest possible value in the history of art, forming a splendid record of mediæval textile pattern. The rood itself has, of course, disappeared, but a great deal of the sculpture of the screen is still left, the richness of the central arch alone showing with what care and completeness the whole work was originally done. Of other objects of interest in the church the most important are the unique lectern, some good misericords and a pulpit. An appeal is being made to the public for funds to restore the church, but no restoration of the paintings, in the ordinary sense of the word, is intended. It is desired to raise the sum of £4,350, and more than £3,000 is urgently needed to make the fabric of the church sound enough to protect the screen against the weather. Subscriptions to the fund may be sent to the vicar, the Rev. R. L. Paterson, Ranworth, Norwich, or to the treasurers of the fund, Messrs. Barclay and Co., Norwich.

The New War Office.

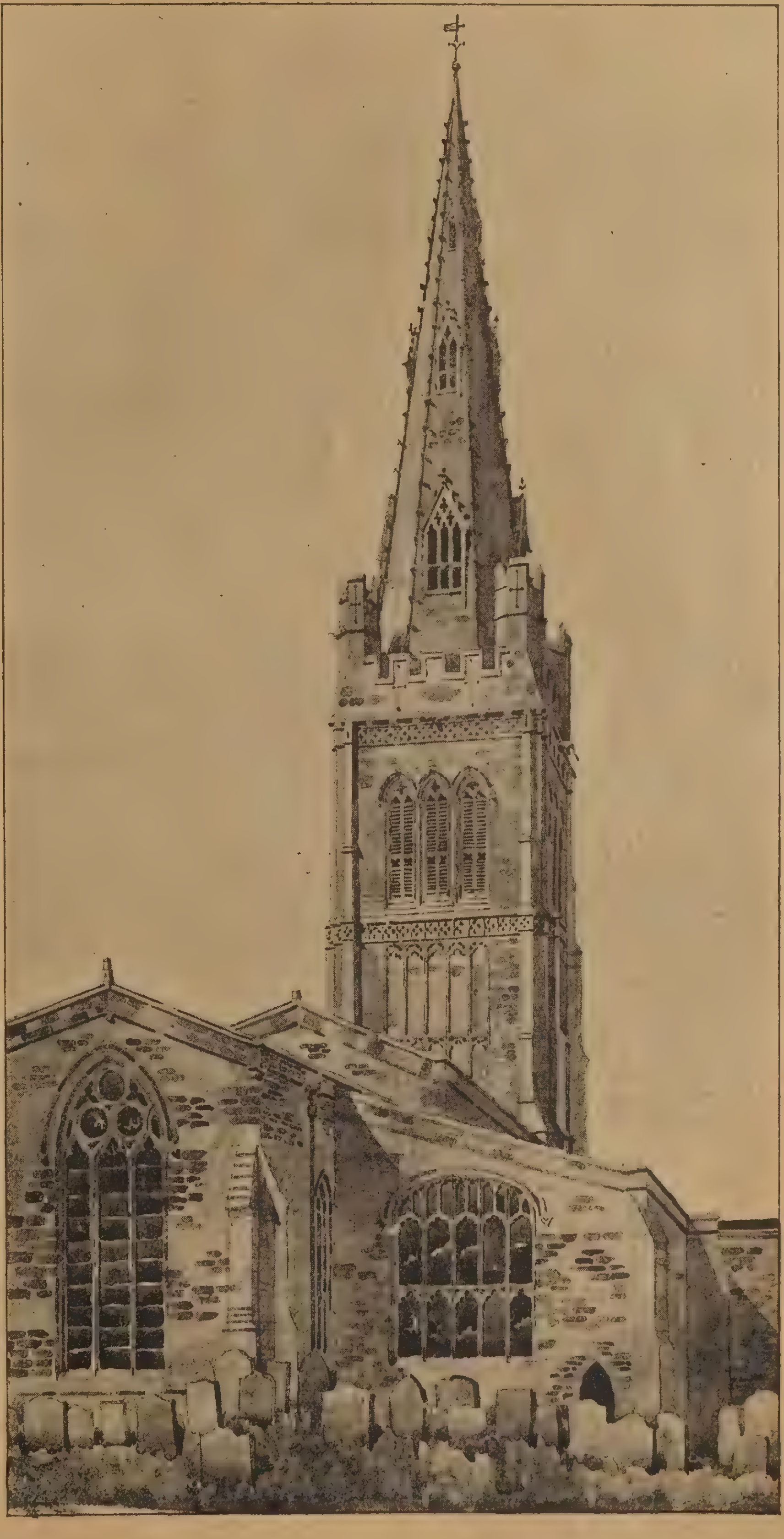
Last Friday the Earl of Wemyss moved in the House of Lords that it was in the opinion of the House desirable that models of all public buildings of importance about to be erected at the public cost should be made and publicly exhibited. He thought that this was more especially to be desired at the present time, and the system he proposed was the almost universal custom in other countries, and had been successfully adopted in our own when Sir Henry Layard was First Commissioner of Works. If a model such as he proposed had been prepared in connection with the new Government buildings in Whitehall the defects of the architect's design in relation to the surrounding buildings would at once have been apparent. All matters affecting public buildings were entirely in the hands of the Office of Works. He had had a long experience of Parliamentary life, and, having followed since 1841 the action of the Office of Works with regard to public buildings and monuments, he had no hesitation in saying its career was marked by many blunders. Was the First Commissioner of Works appointed because of any special aptitude with regard to buildings? Not necessarily. The office was simply regarded by young Ministers as a half-way house between an Under-Secretaryship and a seat in the Cabinet. Among the monstrosities for which the Office of Works was responsible was the flight of stairs in Westminster Hall, which entirely altered the character of the grand old pile. The memorial he had had the honour of presenting to Lord Salisbury was one of the most weighty ever presented. It included the signatures of an archbishop, several bishops, six dukes, two field-marshals, and the names of peers on either side showed the interest taken in this national non-party question. A memorial such as this deserved consideration, and all that the memorialists asked was that for the sake of those who come after us all possible care and precaution should be taken to ensure the erection of War Office buildings in all ways worthy of the site. On the strength of this memorial he rested his motion.

Non-Competitive Designs.

The Marquis of Lansdowne, in reply, said the Government were far from treating the memorial with disrespect, but on the contrary liked to reflect that the memorialists and the Government had the same object, that for a purpose of such importance no building should be erected unworthy of the site and inharmonious with the surroundings. The noble earl asked that a model should be exhibited whenever a public building was about to be erected, in order to protect the public against the erection of an unworthy or inartistic structure, and, above all, that there should be an appeal from the Government of the day to some other tribunal, the precise character of which he certainly failed to explain to the House. Was it so clear as the noble lord supposed, that there was much instruction to be gained from the exhibition of models of buildings? A model on a table never by any chance presented the appearance of the actual building. A model would enable you to regulate the size and proportion of a building on Government ground, but there was no power to regulate buildings alongside on ground not the property of the Government. You might adjust the height of the new War Office buildings, but the huge building, Whitehall Court, behind might put out the whole scale of proportion. As regarded the War Office buildings, it was impossible to comply with the request for a model, but in regard to buildings to be erected hereafter the Chief Commissioner of Works would consider the suggestion. A great part of the speech of the noble earl was an indictment of the manner in which plans were prepared, and their lordships who signed the memorial might not be fully aware of the steps taken by Her Majesty's Government when the matter was decided. The Government decided not to adopt the procedure of inviting competitive designs. The general result of recourse to competitive designs was generally admitted to be unsatisfactory, and our best architects refused to take part in such competitions. Putting that procedure aside, the Government invited the Institute of British Architects to recommend the names of a certain number of architects who in their opinion were well qualified to undertake a building of this sort. A list of names was sent, and a committee of the Cabinet considered these with designs of work done by the architects, and from the list selected two gentlemen, Mr. Young and Mr. Brydon, both architects with considerable reputation. These two gentlemen sent in designs for the new public offices, and these were examined by a committee presided over by the president of the Institute of British Architects and professor of architecture to the Royal Academy. Then the designs were published in March in various illustrated papers, and on the whole the verdict of public opinion upon them was exceedingly favourable.

No Further Delay. The plans and specifications had all been prepared, and they were ready for the quantity surveyor, the ground had been broken in order to test it for the foundations, and to ask them now to hold their hands and to begin again seemed to be an altogether unreasonable proposal. The site, which was worth £20,000 a year, had lain idle quite long enough. The War Office at this moment was scattered about in no less than eleven different buildings; it was an intolerable state of things which interfered to an extent which he did not suppose anybody realised with the efficient conduct of business, and they protested against any further delay in supplying that office with a suitable home. How was the noble earl going to take a *plébiscite* on this matter of plans? What was in the noble earl's mind was a preference for his own plan which he had fathered and put before the public. He admitted that in the noble earl's plan there was a very beautiful façade, but the building was entirely unsuited to a public office; it would completely dwarf the Horse Guards, it cut the site to waste in a most reckless manner, it would cost more money, and it would provide only 17,000ft. of flooring, instead of 29,000ft. as in the Government plan. The fact was the noble earl began at the wrong end. Instead of saying, "I want a public office containing such and such accommodation, give me a beautiful building to put it into," he said, "Here is a beautiful building, shove your public office into it, it has to get there somehow." The noble earl was thinking entirely of the external appearance of these buildings; he himself thought also of the occupants. No amount of adaptation would ever make the plan of the noble earl fulfil the requirements on which they insisted. The Government contended that their buildings would be a very useful and ornamental addition to the buildings which already surrounded Whitehall, and it was their fixed intention to go on with the construction of these buildings as rapidly as possible. After some remarks by Lord Stanmore, the Duke of Norfolk, and the Marquis of Lothian, the motion was withdrawn.

Kettering Church, Northants. This church belongs to the Perpendicular period, with the exception of some few small portions of an earlier date, the remains of a previous church. The tower and spire are, perhaps, the most interesting features. They, together, reach a height of about 176ft., and are well proportioned, good in detail, and good also as regards the quality of the masonry. Our illustration is taken from a wash drawing by Mr. J. Hervey Rutherford which was one of the set that gained the Pugin Studentship prize at the Royal Institute of British Architects, in January this year.



KETTERING CHURCH, NORTHANTS. DRAWN BY J. HERVEY RUTHERFORD.

Professional Practice.

Bedminster.—The foundation stone of a new mission church was laid recently by Lady Smyth. The church is designed in the Gothic style, red Winterbourne stone being used with Bath stone dressings. It has an open timber roof of pitch pine, covered with patent interlocking tiles. At the east end, and raised three steps above the floor of the nave, is a spacious chancel, which will be fitted with choir stalls, room being left for a full-sized two-manual organ. The sanctuary is raised one step above the floor of the chancel, from which it is divided by an oak rail resting upon wrought iron standards of ornamental design. The church is to have an aisle on the south side, divided from the nave by arches and columns of Bath stone; the aisle will be divided by sliding swivel partitions to form five classrooms for Sunday school purposes, each classroom being 16ft. square, and having separate windows. At the west end are to be two spacious vestries for the clergy and choir. Beneath the vestries there will be a kitchen, heating chamber and various offices. The clergy and choir vestries have separate entrances. The main entrance porch will be on the north side; the floor will be laid with encaustic tiles, as will also the entrance lobby to the vestries. In the east and west gables there are to be tall three-light lancet windows; the whole of the windows will be glazed with cathedral glass in lead squares and quarries. The pitch pine woodwork of the roof will be wrought to a fine smooth surface and left in its natural colour. The church has been planned to seat 700 worshippers, exclusive of the choir. The architects are Messrs. P. Munro and Son, of St. Stephen's Chambers, and the contractor is Mr. E. Walters.

Glasgow.—At the Glasgow Exhibition of 1901, the great concert hall and the machinery section buildings will be erected from plans by Mr. James Millar, of Glasgow. The concert hall will be situated in the West End Park in front of the Kelvingrove Museum. It is circular in plan, and measures 143ft. in width by 162ft. from the back of the gallery to the organ case. Its internal diameter is almost as great as that of the Albert Hall, London, and with the exception of that building its floor area will be greater than that of any hall of a similar kind in the kingdom. The auditorium will accommodate 2,500 persons and the gallery 1,500, so that the total seating accommodation is 4,000. The platform will seat an orchestra of 100 performers, and a chorus of 400 persons. The grand organ will occupy the centre space over the platform. The whole will be constructed, as in the case of the main buildings of the exhibition, of steel framework covered with fibrous plaster slabs. The height of the roof is 70ft. at the centre, a cupola at the top acting as ventilator. It is expected that the Town Council will decide to leave this building standing at the close of the exhibition, and retain it as a permanent concert hall or winter garden. The machinery section will be erected on a vacant space called the Bunhouse Ground, immediately opposite the western corner of the main buildings at Dumbarton Road. It will be used for the display of machinery exhibits, and will be connected with the principal portion of the exhibition by a covered way constructed across Dumbarton Road. The bridge springs from between two towers at each side of the road, and has a flat spanning arch which springs from pillars erected on the edge of the pavement. From the end of the bridge on the Bunhouse side a covered verandah extends the full length of the Dumbarton Road frontage It is estimated that this building, including the bridge, will cost over £20,000.

Harrogate.—The assessor in the competition for a new Kursaal (Mr. Frank Matcham, architect, 9, Warwick Court, W.C.) has given his award, which is as follows, viz.:—1st premium, £150, Mr. R. J. Beale, Westminster Chambers, 9, Victoria Street, S.W.; 2nd premium, £100, Messrs. Eade and Johns, architects, Ipswich; 3rd premium, £75, Messrs. Crosby and Power, 9, St. Martin's Street, W.C.

Newcastle.—At a meeting of the New Tramways and General Purposes Committee of the Newcastle Corporation, held on Tuesday, last week, the appointment of an architect for the new electrical power station, was considered. Applications were received from several local architects. It was decided to appoint Mr. B. F. Simpson, of Grey Street, to fill the position.

The new Infirmary Committee, with the assistance of Mr. Waterhouse, last Saturday week placed the competitive plans for the Jubilee Infirmary, to be erected on part of the Town Moor. The estimated cost of the selected plans is £150,000. There were twenty-three architects in Newcastle and elsewhere invited to compete; eighteen accepted the invitation. Six afterwards withdrew, while four did not send in plans, thus reducing the actual number of competitors to eight. The adjudication of the committee is as follows:—1, Messrs. Wm. Lister Newcombe, Newcastle, and H. Percy Adams, London, who are in this matter acting conjointly. These gentlemen secure the building of the new infirmary. 2, Messrs. Simpson, and Milnes Allen, London (premium £150); 3, Messrs. Gibson and Pite, London (£100); 4, Mr. W. Henman, Birmingham (£50). The new infirmary is to contain 400 beds. In the design adopted, all the surgical wards are on the ground floor. The architects submit an alternative scheme, on cheaper lines, costing a little over £100,000. The area of the new building will be 107,886 superficial feet, of which 15,921 will be taken up by the administrative block. The plans have been exhibited in the Town Hall.

Royton.—The memorial stones of a new Baptist chapel and schools were laid recently. The new chapel and schools will be in the Gothic style, comprising a range of buildings two storeys in height. The schoolroom, which will be underneath the chapel, is designed on the central hall principle, the main room being 71ft. long, 24ft. wide, and 14ft. 9in. in height. The whole of the eleven classrooms will be separated from the main hall or schoolroom, with openings filled in with pitch pine framings and glass screens. The whole of the walls to school and classrooms are to be finished off in pitch pine wainscotting 4ft. 6in. in height, and all the classrooms will be seated round with pitch pine seats. In front of the rostrum in the schoolroom will be the baptistry enclosed within the platform. The school will provide accommodation for about 400 scholars. The chapel will be erected directly over the schoolrooms, and will be 71ft. long, 44ft. wide, and 34ft. high from floor to ceiling. The main entrances are to be on each side of the front of the building, and will lead into two entrance porches and thence to the two aisles of the chapel, which is capable of seating 366 persons. The front of the chapel will be built with Hipperholme parpoint base, and with Halifax polished stone dressings, and it will be faced with Ruabon stock bricks. The whole of the general internal fittings to the chapel are to be in selected pitch pine, the roof of pitch pine being semi-circular up to collar beams. The back of the premises will be occupied by the minister's vestry and young mens' institute, also by kitchen arrangement for parties, and a cellar to contain heating apparatus. The whole of the buildings will be heated with hot water, and ample provision will be made for ventilation by means of Tobin's inlet tubes and mica flap outlets, with tower ventilator on chapel roof. The front window of the chapel will be glazed with ornamental lead lights, and the other windows with cathedral glass of neat design. The amount of the contract for the whole of the work is £2,554. The architect for the building is Mr. David Wolstencroft, of Royton.

The New Diocesan Church House for Liverpool, the foundation stone of which was laid last week by the Countess of Derby, is to be built at a cost of between £30,000 and £40,000.

Keystones.

The New Theatre Royal at Chatham, which was opened last week, has been built by Alderman C. E. Skinner from designs by Mr. G. E. Bond.

Gift of a Church.—The Earl of Carysford has presented to the inhabitants of the ancient town of Arklow, County Wicklow, a fine new church. The building has cost his lordship £30,000.

The Foundation Stone of a New Parochial Institute has been laid in connection with the church of Emmanuel, Leeds. The cost of the undertaking is estimated at about £4,500.

Bradford Antiquarian Society.—A party of about seventy members and friends of this society visited Tong and Fulneck last Saturday week. The party spent a very enjoyable time in inspecting these places.

An Addition to Warminster Cottage Hospital, in the shape of a new wing, was opened by the Bishop of Salisbury last week. The addition is to be used as a men's ward, and has cost about £1,000 to erect.

A new Fire Station at Lewisham was opened last Thursday. The building is in red brick and has been erected in the High Street. The site cost £975, and the tender of Messrs. Holloway Bros., of Battersea, was for £13,600.

New Public Offices at Hipperholme were opened last Wednesday by Mr. Thomas Brown, chairman of the Hipperholme Urban District Council. The new offices are situated at Whitehall, and have been erected at a cost of about £3,000.

The New Technical School at Durham is to cost about £7,000. The foundation stone was laid last week by the Earl of Durham. The architects are Messrs. Oliver and Leeson, of Newcastle-on-Tyne, and the contract has been let to Messrs. Gradon and Son, of Durham.

Sir William Richmond, R.A., has resigned his position of Professor of Painting in the Schools of the Royal Academy, and Mr. Herkomer, R.A., has been elected to the post. There were only two candidates for the office —Mr. Herkomer and Mr. Storey.

The First Block of the New St. Boniface College, Warminster, was consecrated by the Bishop of Salisbury last Tuesday week. The new block has cost £3,500. The college, which will be a handsome Jacobean structure, is estimated to cost over £10,000.

Durham Cathedral Vestry.—The Dean and Chapter of Durham have decided to rebuild the ancient vestry of the cathedral on the old foundations. It stood against the wall of the south choir aisle, between the transept and the nine altars, and was built by the Prior Henry de Luceby.

The Royal Academy Exhibition.—As soon as the exhibition is closed Mr. T. G. Jackson, R.A., will begin the projected alterations in the entrance hall and vestibule. The vestibule has always seemed mean, but when marble and other handsome decorations are given it the right note will be struck.

New Church and Schools at Cheetham.—The ceremony of laying the memorial stones of new schools for Trinity Presbyterian Church took place recently. The new church and schools are being erected at a cost of £5,000, but the ceremony in connection with the church is postponed until later in the year.

Proposed Memorial to Simon de Montfort at Evesham.—A preliminary meeting of the committee formed to promote this object was held at the Star Hotel, Worcester, last week. It is proposed to erect an equestrian figure in aluminium on a suitable base and under a canopy on the spot where Simon de Montfort was buried, that is close to where once stood the high altar of Evesham Abbey, of which there is now no trace. Permission has been obtained from the owner of the land, Mr. E. Charles Rudge, who is lord of the manor, and Mr. R. A. Briggs, F.R.I.B.A., has been appointed architect. The monument is estimated to cost about £2,500.

The Foundation Stone of a New Drill Hall at West Bromwich was laid by the Mayor (Councillor S. Pitt) at the beginning of last week. The new hall is to be built from plans by Messrs. Wood and Kendrich by Mr. J. Dallow, at a cost of about £2,000.

Torry School, Aberdeen, is to be Enlarged at a total cost of £3,500. The following are the contractors for the work: Masons, A. Milne and Sons; carpenters, J. and W. F M'Robb; slater, William Coutts; plumbers, J. Blaikie and Sons; painters, Lamb and Sons; heating engineer, Robert Tindal; iron and steel work, J. Abernethy and Co.

The Lighting and Decoration of the Liverpool Masonic Hall.—The quarterly meeting of the Hall Committee of the Masonic Hall was held recently, at which it was agreed that on the completion of the installation of the electric light, tenders should be procured for the decoration of the large lodge room, chapter room, banquetting room, &c.

Town Hall for Heckmondwike.—The Heckmondwike District Council acquired a triangular block of cottage property on the top side of the town's green some time ago. At a council meeting recently it was decided to appropriate the site for a Town Hall, and to apply for borrowing powers for the amount paid for the property for a period of fifty years.

The Mowbray Memorial.—It was decided last week that, with the concurrence of the Speaker and the First Commissioner of Works, the memorial to the late Sir John Mowbray should be placed eitwer in the committee room in which he presided for so many years over the Committee of Selection and of Standing Orders, or in the corridor staircase adjoining that committee room.

A Building Accident at Monaco occurred on July 29th. The wall of a building which is in course of construction as an annexe to a hotel at Condamine, collapsed, and fell upon about fifty workmen who were engaged on the premises. Three of these were killed, and eleven more, who were rescued from the *débris*, were found to have sustained more or less serious injuries.

The First Pair of Girders for the New Kew Bridge arrived last Wednesday from Darlaston. They are 85ft. in length. At Hammersmith Station it took four hours to get each of them on to specially constructed trollies, and sixteen powerful dray horses were required to draw each girder from the station yard to Kew Bridge, a portion of the station wall and a fence being knocked down in the process.

Public Gardens in Liverpool.—A Local Government Board inquiry was held recently in the Liverpool Municipal Offices, by Mr. G. W. Willcocks, M.I.C.E., one of the Board's inspectors, with regard to an application of the Corporation for sanction to borrow £1,400 for the purpose of laying out as public walks St. Martin's Recreation Ground and St. Martin's-in-the-Fields Churchyard. The inspector subsequently visited the sites.

New Freemasons' Lodge at Hornsea.—The foundation-stone was laid recently of the new Masonic temple of the Alexandra Lodge, in Eastbourne Road, Hornsea. The building, which is to be a two-storeyed one, will be of red and white stock bricks, with stone dressings. On the ground floor there will be a dining hall capable of seating upwards of seventy persons. Bro. Peter Gaskell, P.M., P.P.G.O., is the hon. architect and clerk of the works.

Bromley Wesleyan Chapel is being Renovated at a cost of over £300. It is being re-floored and re-seated with pitch-pine by Mr. C. A. Horton. There will be four pitch-pine screens, with leaded lights (two on each side of the aisles). A 3ft. dado is being put round the walls. The aisle doors will be covered with red baize, relieved with oak beading; and the porch is being laid with encaustic tiles. The chapel ceiling will be covered with Anaglypta in the Renaissance style, and the gallery ceiling is also being covered with Anaglypta of Italian design. The panels round the gallery front are being fitted with Lincrusta-Walton panels.

The Redecoration of Stewart's Hall, Huntly, is being executed from designs by Mr. Marshall Mackenzie, of Aberdeen, by Mr. A. Robertson, of Huntly. The hall is being artistically treated. Immediately over the ground lining runs a richly-stencilled border, relieving the filling, which is run off in subdued crimson. The whole is surmounted by a frieze, which harmonises well with the woodwork of the roof, which has been washed and revarnished.

A Novel Church.—The minister of the first Baptist Church of Columbus, Ohio, is having a church built in which a theatrical stage will serve as a pulpit. The new building is planned exactly like a theatre. There will be private boxes with curtains, and the choir and instrumentalists will sit before the stage in the place usually occupied by the orchestra. The body of the church will be fitted with foyer seats. Rooms for checking hats, cloaks, and umbrellas will be provided.

Wesleyan Central Hall for South London. — A series of fifteen commemoration stones were laid a short time ago in what is to form the main entrance of the new South London Wesleyan Mission Central Hall, now being erected at the corner of Bermondsey New Road and the proposed Bermondsey approach to the Tower Bridge. This hall is estimated to cost £30,000, and is to have a seating capacity for nearly 3,000 persons, and a smaller hall to seat 800 persons is to be built below the street level.

New Parochial Buildings at Bethnal Green.—The Bishop of London recently laid the foundation stone of the parochial buildings in connection with the Church of St. James the Less. The buildings, including furnishing, will cost about £16,000, and will comprise a mission hall, a church parlour, day and Sunday schools, clubs for men and boys, girl's technical drawing and cookery rooms, a gymnasium, and a dispensary. When finished these buildings will be the largest parochial premises in East London.

New Lairage and River Frontage Works at Deptford.—Mr. W. H. Liversidge, chairman of the Cattle Markets Committee of the Corporation of London, drove the first pile of the river frontage works and laid the first stone of a block of new lairage at the Foreign Cattle Market, Deptford, last week. The object of the frontage scheme is to connect the existing jetties so as to form one continuous river frontage, and the estimated cost is £15,000. The new lairage will cost approximately £23,000.

Enlargement of St. Mark's Church, Newtown. — At the Liverpool Consistory Court recently an application was made for permission to enlarge St. Mark's Church, erect a chancel, provide an organ, and increase the sitting accommodation. The cost would be about £2,200. The nature of the alterations was explained by the architects, Messrs. Heaton and Ralph, of Wigan, and the Vice-Chancellor granted a faculty on condition that the work was commenced within twelve months.

Clearing Leeds.—The Leeds Corporation has been clearing out "rookeries" and slums not fit for human dwellings, and it will not be long before the last will be seen of many of the city's old courts and thoroughfares. Wood Street has disappeared, the Shambles are quickly following, and now an old yard known as "Infirmary-yard," between Kirkgate and Market Street, but having no thoroughfare, is just being cleared of its fifty houses, many of which were built in the reign of Queen Anne.

New Library for North Bristol.—A new library is to be erected in Cheltenham Road. The site has cost £2,575, and the contract for the library has been let to Messrs. Wilkins and Son for £7,439. The building, which has been designed by Mr. W. V. Gough, of Bridge Street, will comprise a spacious reading room, in addition to the lending department and other offices. Application is to be made to the Local Government Board for permission to borrow £8,800 for the erection and equipment of the new library.

The Memorial Stone of a new Primitive Methodist Manse, at Ilkeston, was laid by Mr. George Wolliscroft recently. The new building is to be built in semi-Gothic style, in red bricks with stone dressings. The entrance hall will be 7ft. wide, and there are to be four rooms on the ground floor, and a like number on the next floor, as well as an attic. The contract for the work is £588. The architect is Mr. G. H. Micklin, of Ilkeston, and the contractor is Mr. E. L. Clayton, of Lord Haddon Road, Ilkeston.

The New Miners' Institute and Club at Seaton Burn has been erected at a cost of about £332, and was opened recently. The new structure is situated in the centre of the village, and is substantially built of freestone with plain dressings. Inside, the walls of the various apartments are lined with timber stained and varnished. On the ground floor there is a commodious billiard room, with two tables, while upstairs there are apartments which will be utilised as a library, committee, and smoke rooms. The architect is Mr. Amos Grey.

Serious Fall of a Bradford Labourer.—Whilst a man named Sim Wilkinson, labourer, in the employment of Messrs. R. and F. Dawson, contractors, of Great Horton, was engaged in the erection of some scaffolding at the old Bowling Ironworks, Bowling, Back Lane, he slipped and fell backwards to the ground, a distance of 25ft. Fortunately his fall was broken by his striking against a ladder, but when help was rendered he was unconscious, and had sustained injuries to the head and a fracture of the left arm. He was removed to the infirmary.

Burne-Jones Memorial Fund. — The executive committee of this fund, who were charged with the selection of a picture to represent Sir Edward Burne-Jones in the National Gallery, announce that they have secured the offer of "King Cophetua and the Beggar Maid," which belongs to the executors of the Earl of Wharncliffe, who had agreed (subject to the approval of the Court of Chancery) to sell it to the committee for the sum of £6,500. The funds already subscribed and acknowledged amount to about £4,000, and there is therefore needed £2,500 to complete the purchase. Those who desire to be associated in this gift to the nation in memory of a great artist, are invited to forward their donations to Messrs. Glyn and Co., 67, Lombard Street, E.C., or to the hon. treasurer, Mr. Alexander Henderson, 52, Princes Gate, S.W.

Church Congress Art Exhibition.—Lord Dillon, as President of the Society of Antiquaries, with the secretary and treasurer of that society and representatives of kindred bodies, have issued a letter inviting contributions of articles of interest to the loan collection in connection with the Ecclesiastical and Educational Art Exhibition, which will be held as usual in conjunction with the Church Congress. Special provisions will be made by Mr. Hart to ensure the safety of articles on loan, and a committee of antiquarians and archæologists will see that those provisions are carried out. It is suggested that a short description of objects intended for the loan collection should be sent as soon as possible to Mr. Hart, at Maltravers House, Arundel Street, Strand, W.C.

The Tyne Theatre, Newcastle, was reopened last week after having been closed for three weeks for the purpose of redecoration. From the entrance doors away to the stalls and upstairs to the circle, the woodwork has been painted in white "pearline." The walls have been covered with silk brocade, and there is a dado of Lincrusta Walton set off by a golden slip. Within the auditorium the walls have been scraped and covered with a red-tinted paper. The stalls have been re-upholstered, and the floors have been recarpeted. The new wings of the stage have been painted by Mr. James Hicks, the resident artist. Other parts of the building have been renovated, including the refreshment bars. Mr. W. E. Harker, of Grainger Street, carried out the work of renovation, and Mr. Samuel Sykes, of Westgate Hill, attended to the decorating work.

New Patents.

The following abridged description is specially drawn for the Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters.*

7,687. Walls, Partitions, &c. — Patentees: J. Sheppard, of Hornsey Lane, N., and F. Dashwood, of Hersham Road, Walton-on-Thames.—Relates to improvements on hollow bricks and tiles. Dovetail grooves are formed in the sides and ends of the bricks and tiles, to receive mortar, and dowels of mortar in the perforations lock the bricks and tiles together. Shallow dovetail grooves may be formed in the faces of partition tiles to receive keys of plaster. The moulded bricks and tiles are stacked in racks between corrugated pallets which are perforated to allow air to circulate freely.

7,808. Buildings, &c.—Patentee: W. Borrows, of Providence Foundry and Locomotive Works, Sutton, St. Helens, Lancashire.—Floors and flooring; girders and beams. The girders rest on another girder, and the three are united by clip plates, the bolts of which do not pass through the girders. The brackets or hanger may be attached to the girder in the same manner.

16,817. Fastenings (Window and Door).—Patentee: G. Krause, of Rudersdorfer Strasse, Berlin.—A wedge for blocking doors and windows, consists of a wire frame with three or more prongs which are bent at right angles to the main portion. The bar is placed close to the door, &c., and it and the prongs rest on the floor, forming a wedge to prevent the door, &c., from being opened. The wedge may be formed from a bent metal plate with prongs and may have an adjustable spring plate formed integral with or attached to it. The wedge can also be used to prevent the closing of a door or window by an air draught.

17,749. Roofs.—Patentee: E. B. Podmore, of Birds Royd, Brighouse, Yorkshire.—The turned up edges of zinc or other roofing sheets are covered with metal caps secured by screws. Asbestos or like packing is inserted between the flanges of the cap and sheets.

22,712. Stays for Window Casements.—Patentee: M. Platzer, of Tirschenreuth, Bavaria.—The stay consists of a rod telescoping on to a sleeve and capable of being secured in any position by a binding-screw on the sleeve. The sleeve is pivoted to the frame, and the rod to the sash, or vice versa, the sash being held closed, or open in any desired degree. In the case of double windows, the stay is preferably arranged between the windows.

Bradford Theatre Royal has been renovated and altered at a cost of over £2,000. In the auditorium the ceiling has been entirely remodelled in fibrous plaster, and is arranged in a geometrical design inclosing panels painted to symbolise the arts. The proscenium has been enriched by ornamental mouldings in plaster and carved wood work. The ceiling of the pit is treated in Lincrusta Walton, and the ceilings of the circle, vestibule, and foyer in Tynecastle of rich design and high relief. The foyer itself has been rearranged. In the gallery have been placed rows of ornamental ironwork, painted and gilt, which will render access and egress more convenient. The decoration of the exterior of the building has also been renewed. The contractors for the different portions of the work are:—Decorations, Messrs. Jonas Binns and Sons, Halifax; masonry, Mr. W. Johnson, Bradford; decorative ironwork, Mr. Albert Wood, Bradford; and electric fittings, Messrs. Verity and Co., Manchester and Birmingham.

New Companies.

Jarrah Timber and Woodpaving Corporation, Limited.

The first batch of allotment letters for the issue of £100,000 five per cent. first mortgage debenture stock of the Jarrah Timber and Woodpaving Corporation, Limited, have been posted.

Palmers, Limited.

This company was registered on July 18th, by Waterlow and Sons, Limited, London-wall, E.C., with a capital of £5,000 in £10 shares, to carry on the business of brick and tile manufacturers, clay and marl merchants, &c. Registered without articles of association.

London Building Trades' Supply Company, Limited.

This company was registered on July 27th, by W. H. Carlton, 11, Queen Victoria Street, E.C., with a capital of £1,000 in £1 shares, to carry on the business of brick and tile manufacturers, timber and iron merchants, &c. Table A mainly applies.

Devon Slate Quarries, Limited.

This company was registered on July 28th, by A. Sargeant, 43, Bishopsgate Street Within, E.C., with a capital of £10,000 in £1 shares, object as indicated by the title. The first directors (to number not less than two nor more than seven) are to be appointed by the subscribers. Remuneration as fixed by the company.

Wickford Brick and Tile Company, Ltd.

This company was registered on July 25th, by Donald McMillan and Mott, 11-12, Clements Lane, E.C., with a capital of £10,000 in £1 shares, to acquire and carry on the business of a brick and tile maker now carried on at Downham and South Hanningfield, Essex, by J. S. Maryon. Table A mainly applies.

Sheffield Freehold Company, Limited.

This company was registered on July 21st, by Waterlow and Sons, London Wall, E.C., with a capital of £10,000 in £10 shares (500 preference), to acquire and deal with land, house, and other property, and to carry on the business of builders, contractors, stone and timber merchants, &c. Table A mainly applies. Registered office: Independent Buildings, Fargate, Sheffield.

King's Sanitary Appliances Syndicate, Limited.

This company was registered on July 19th, by F. T. Mawby, 3, Adelaide Place, E.C., with a capital of £10,000 in £1 shares, to enter into an agreement with J. King for the acquisition of certain patents, and to carry on the business of iron founders, machinists, electrical and sanitary engineers, &c. The first directors are to number not less than four nor more than six. Mr. J. King is the first managing director.

Patman and Fotheringham, Limited.

This company was registered on July 24th, by Ford and Co., 38, Bloomsbury Square, W.C., with a capital of £100,000 in £1 shares, to acquire and take over as a going concern the business of builders and contractors now carried on under the style or firm of Patman and Fotheringham, at Theobald's Road, Gray's Inn, and Park Street, Islington, with all or any assets and liabilities thereof, to adopt an agreement expressed to be made between James F. Parker and A. E. Parker of the one part and this company of the other part, and generally to carry on in all or any of their respective branches the businesses of general builders, contractors, decorators, merchants, importers and dealers in stone, sand, lime, timber, hardware, and all building and draining materials and requisites, manufacturers of and dealers in bricks and tiles, terra-cotta, cement, artificial stone, &c.; as paviors, surveyors, house and estate agents, suppliers of gas, water, electricity, and other powers, as warehousemen, wharfingers, barge owners, lightermen, forwarding agents, carriers by land and sea of goods and passengers, as general agents, general traders, ironmongers, glass merchants, corn merchants, hay and straw salesmen, sawmill proprietors, stone quarry and sandpit owners, ironfounders, engineers, &c.; to establish, or build and maintain furnaces, crushing and hydraulic, works, factories, warehouses, shops, places of amusement, hotels, clubs, and restaurants; to acquire and turn to account any real or personal property, patents, &c. The signatories (each one share) are Messrs. J. F. Parker, A. E. Parker, G. Traill, J. Traill, F. M. Parker, E. M. A. Parker, and T. Maskall. The first directors are J. F. Parker and A. E Parker. Qualification, 40,000 shares each. Remuneration £1,000 per annum each.

Lantern China Clay Company, Limited.

This company was registered on July 29th, by C. Doubble, 14, Serjeants' Inn, E.C., with a capital of £8,000 in £1 shares, to adopt an agreement with J. F. Pagen and A. Helder, and to acquire and work any china-clay works, beds, quarries, &c., in Cornwall. The first directors (to number not less than two nor more than five) are A. Helder and J. F. Pagen. Qualification, £100. Remuneration as fixed by the company.

Chester Engineering and Casement Manufacturing Company, Limited.

This company was registered on July 25th, by C. Doubble, 14, Serjeant's Inn, E.C., with a capital of £10,000 in £1 shares, to acquire the business carried on at the Smithfield Works, George Street, Chester, by Robert L. Williams, and Thomas Payne, under the style or firm of R. L. Williams, to carry on the business of plumbers, glaziers, manufacturers of metal casements, &c., and to adopt an agreement with the said vendor. The first directors (to number not less than three nor more than five) are Robert L. Williams, Thomas Payne, and Joseph Nanson. Qualification, 100 shares. Remuneration as fixed by the company.

Royston Cement Company, Limited.

This company was registered on July 26th by H. T. Coburn, 54, Leadenhall Street, E.C. with a capital of £65,000 in £1 shares, t adopt and carry into effect an agreement expressed to be made by G. B. Wilson of the one part and this company of the other part for the acquisition by purchase or otherwise, a a going concern, of the business of cemen manufacturers, &c., as now and hithert carried on at Barrington, in the county o Cambridgeshire, with all or any assets an liabilities thereof, together with the freehol properties appertaining thereto, consisting o about 230½ acres or thereabouts, and also th fixed and movable plant, machinery an apparatus used in connection therewith; als the lease of the branch tramway connectin the works with the Great Northern Railway; t develop and turn to account the said property i such manner as the company shall see fit; and generally to carry on in all or any of their respective branches, the businesses of cemen manufacturers, lime-burners, brick and til makers, &c.; and further to acquire any mine mining, and other rights, &c., in any part o the world, to turn to account the same, and t carry on the business of a mining company i all its branches; to develop the resources lands, &c., by clearing, &c.; as stock-raiser builders, and contractors, &c., stock and shar dealers, bankers, financiers, and concessionaires; engineers and metal founders; to la out towns and villages, &c.; to acquire an turn to account any patents, patent right and inventions, real and personal property, & The signatories (each one share) are Messr T. Livingstone, W. A. Owston, A. Long, H. Crawley, G. B. Wilson, H. Brodrick, and S. Simmons. The first directors are to be electe by the company. Qualification £100. Remuneration, £100 per annum (chairman £150) wit a percentage of the profits, divisible.

Sanderstead Estate Company, Limited. This company was registered on July 25th, by Taylor and Taylor, 10, New Broad Street, E.C., with a capital of £20,000 in £50 shares, to acquire and deal with any lands and other property, and to carry on the business of builders, building material merchants, &c. The first directors (to number not less than three nor more than twelve) are J. Atherton, J. Demetrius, A. Jacobs, T. H. Robinson, and G. L. Turner. Qualification, ten shares. Remuneration as fixed by the company. Registered office: 10, New Broad Street, E.C.

A New Church at Cannick, Strathglass, was opened last week. It is in Gothic style, and will accommodate about 250 persons. Mr. John Robertson, of Inverness, is the architect.

Accident during Excavating. — A labourer named Henry Riley Booker, of Pennyfoot Street, Nottingham, had his left leg broken through a fall of earth whilst he was at work excavating for Mr. Lockwood, at Lenton.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 0 0
Sainfoin mixture	do.	3 10 0	4 5 0
Clover, best	do.	3 10 0	5 0 0
Beans	per qr.	1 6 6	—
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 2 2	1 4 0
Colza Oil, English ...	per cwt.	1 3 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 8 9	1 9 0
Linseed Oil	per cwt.	1 0 3	—
Neatsfoot Oil ...	per gal.	0 2 6	0 4
Petroleum, American ...	per gal.	0 0 6¼	—
Do., Russian ...	per gal.	0 0 5¼	—
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 5 0	1 7 3
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	1 10 6	—
Glue	per cwt.	1 14 0	2 18 6
Lead, white, ground, carbonate	per cwt.	0 19 0	—
Do. red	per cwt.	0 17 3	—
Soda crystals	per ton	2 15 0	—
Shellac, orange	per cwt.	3 4 6	—
Do. sticklac	do.	2 2 6	2 15 0
Pumice stone, ...	do.	0 8 9	—

METALS.

Copper, sheet, strong ...	per ton	88 0 0	—
Iron, bar, Staffs. in London	do.	8 0 0	9 0 0
Do. Galvanised Corrugated sheet ...	do.	13 0 0	13 10 0
Lead, pig, Spanish ...	do.	14 8 9	—
Do. English common brands	do.	14 13 9	—
Do. sheet, English, 6lb. per sq.ft. and upwards	do.	16 10 0	—
Do. pipe	do.	17 5 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 0 0	10 0 0
Do. floor brads	do.	8 15 0	9 15 0
Tin, Foreign	do.	143 12 6	144 2 6
Do. English ingots ...	do.	146 10 0	—
Zinc, sheets, English ...	do.	140 0 0	28 10 0
Do. Veille Montaigne ...	do.	31 0 0	—
Do. Spelter	do.	25 15 0	26 0 0

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	do.	4 7 6	6 5 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Deals, Petersburg	do.	4 0 0	6 10 0
Do. Archangel 2nd & 1st	per P. Std.	10 10 0	—
Do. do. 4th & 3rd.	do.	12 0 0	12 5 0
Do. do. unsorted	do.	7 5 0	8 5 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	10 10 0	16 0 0
Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	10 0 0	10 15 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	9 5 0	16 10 0
Do. White Sea	do.	12 5 0	—
Do. Quebec Pine, 1st...	do.	18 0 0	19 0 0
Do. do. 2nd	do.	12 0 0	—
Do. do. 3rd &c.	do.	7 15 0	9 15 0
Do. Canadian Spruce, 1st	do.	9 0 0	10 5 0
Do. do. 3rd & 2nd	do.	6 5 0	7 15 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	6 10 0	8 10 0
Flooring Boards, 1 in. prepared, 1st	per square	0 9 6	0 12 0
Do. 2nd...	do.	0 8 9	0 10 9
Do 3rd &c.	do.	0 6 9	0 9 6

HARD WOODS.

Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4	0 0 4½
Do. Honduras	do.	0 0 3½	—
Do. Tobasco	do.	0 0 4½	0 0 5½
Elm, Quebec	per load	4 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 4 7/8	—
Do. African ...	do.	0 0 3½—4 5/8	
Do. St. Domingo ...	do.	0 0 5 9/32	—
Do. Tobasco ...	do.	0 0 4 15/16—6 1/32	
Oak, Dantzic and Memel	per load	3 5 0	3 5 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	8 15 0	13 15 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ...	per cub.ft.	0 2 6	0 4 2

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

BISHOP'S STORTFORD.—For the erection of a pair of cottages for Mr. Thomas Swatheridge. Alfred Brett, architect, Bishop's Stortford:—

D. Robinson	£411	F. Cannon*	£370

* Accepted.

BECKENHAM.—For the erection of an electric light station, for the Urban District Council. Mr. J. A. Angell, Engineer, Council Offices, Beckenham. Quantities by Messrs. R. L. Curtis and Son, 120, London Wall, E.C.:—

Smith and Sons	£9,016	B. E. Nightingale, Albert Embankment, S.E.*	£8,173
H. and H. F. Higgs ..	8,716		
T. G. Sharpington ...	8,297		

* Accepted.

CYMMER (Wales).—For the erection of hospital for infectious diseases, for the Glyncorrwg Urban District Council. Mr. G. F. Lambert, architect, Bridgend:—

Phillip Gaylard	£2,005	William Francis	£1,797
John Davies	2,010	Davies and Son, Treherbert*	1,676
David Jones	2,004		
Edward Preece	1,800		

* Recommended for acceptance.

DARTFORD (Kent).—For an addition to the "Bull" Hotel, High-street, for Mr. Frank Day. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural.

H. L. Holloway	£5,625	Wallis	£5,289
Archer	5,540	Little and Senecal ...	5,260
Tuffee	5,390	Pritchard & Renwick*	5,097

Internal Fittings.

Pritchard & Renwick*	£1,490	Burman and Son ...	£1,425

Pewtering.

Warne and Co...	£168	J. McPherson	£126
H. and F. Warne *... ...	130		

Gasfittings.

A. Nathan*	£297 0 0	Biggs and Co. ...	£229 11 6
W. Winn...	268 6 6		

* Accepted.

ELSENHAM.—For the erection of six cottages for Gold Bros. Alfred Brett, architect, Bishop's Stortford:—

F. A. Adams	£1,300 0	D. Robinson, sen.* ...	£984 10
W. Robinson	995 0		

* Accepted.

EYE (Suffolk).—For the erection of a kiln and additions to malting, for Messrs. C. Fisher and Co. Mr. H. G. Bishop, architect, Cheapside, Stowmarket. Quantities by Mr. C. Oswald Robson, 50, Queen Anne's Gate, S.W.:—

	Malting.	Kiln.	Total.
H. Plummer	£1,949	£963	£2,912
W. Murray	2,106	750	2,856
Theobald and Sons ...	1,846	690	2,536

FROME.—For the erection of new hospital and nurses' home. Mr. B. Vaughan Johnson, architect, Westminster, S.W. Quantities by Messrs. Tucker and Huntley, 33, Argyll-street, W.:—

Hibberd	£4,271 5 10	Hodder & Sons...	£4,095 0 0
C. Barnes	4,145 0 0	Chislett & Sons	3,824 14 0

[All of Frome.]

HURSLEY (Hants).—For new workhouse. Messrs. Cancellor and Hill, architects, Winchester:—

C. Jobbins	£11,177 0	F. Beale	£9,674 0
Worl and Way ...	10,250 0	Rashley	9,635 0
J. Treherne	9,835 13	Mussellwhite and Son, Basingstoke*	9,198 0
F. Walter	9,687 0		
Jenkins and Son...	9,683 0		

*Accepted.

LONDON.—For proposed residence in the Bishop's-avenue, Finchley. Mr. G. E. Nield, architect, Outer Temple, Strand. Quantities were supplied:—

Willmott and Sons ...	£6,464	Walter Gladding	£5,757
Grover and Son	6,254	Falkner and Sons ...	5,673
Coulsell Bros.	6,050	Chessum and Sons ...	5,559
William Downs	5,855	J. W. Dixon (accepted)	5,300

LONDON, S.W.—For rebuilding the "Loughboro' Hotel" and Assembly Rooms, Loughboro'-road, Brixton, S.W. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural.

H. L. Holloway	£10,060	Little and Senecal ...	£9,467
Courtney & Fairbairn	10,010	G. Minter	9,342
Ansell and Son	9,999	Edwards and Medway	9,175
Hooper and Son... ..	9,975	W. Rowe*	9,070

Mahogany Fittings.

W. Rowe	£1,575	Brown and Co.*	£1,505

Pewtering.

R. E. Lane	£150 0	H. and F. Warne ...	£139 5
Warne and Co.*... ...	147 0		

* Accepted.

LONDON, W.—For reconstruction of the buffet of the "Castle Hotel," Regent-street, W., for Mr. F. W. Trew. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural and Fittings.

W. Rowe	£2,008	Pritchard and Renwick*	£1,760
Little and Senecal ...	1,854		

* Accepted.

LONDON, S.W.—For reconstructing the "Balham Hotel," Chestnut-grove, Balham, S.W., and building billiard-room and masonic hall, for Mr. W. R. Huntley. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Wallis	£6,530	H. L. Holloway	£5,623
Treves	6,272	W. Rowe	5,646
Wills...	5,804	Courtney & Farbairn...	5,539
Whitehead and Co. ...	5,755	Hooper and Son*... ...	5,450
F. H. Hopkins	5,729		

Mahogany Fittings.

Brown and Co.*	£1,335

*Accepted.

LONDON, S.W.—For sanitary and drainage works at Shillington-street School, Battersea, for the London School Board. Mr. T. J. Bailey, architect:—

	Iron drains throughout.	Stoneware drains throughout.	Iron and Stoneware drains.
G. Foxley	£3,583 0	£3,047 0	£3,197 0
Martin Wells and Co. ...	3,497 19	3,276 0	3,380 0
W. Hammond	3,121 0	2,901 0	2,986 0
J. Carmichael	2,606 10	2,413 10	2,461 10
Lathey Bros.	2,563 0	2,383 0	2,433 0
Stimpson and Co.... ...	2,532 0	2,372 0	2,412 0
J. and C. Bowyer	2,499 0	2,328 10	2,374 10
E. Triggs*	2,432 0	2,279 0	2,316 0

*Accepted.

LONDON, W.C.—For alterations to the "Excelsior" public-house, 153, Charing Cross-road, W.C., for Mr. Richard H. Ead. Messrs. Clark and Hutchinson, architects, 28, John-street, Bedford-row, W.C.:—

Wm. Antill and Co. ...	£890	H. Burman and Sons ...	£586
W. H. Lascelles and Co.	636	Sanders and Sons	526

LONDON, W.—For constructional alterations at No. 9, Mansfield-street, W., and stables at rear. Mr. F. W. Foster, architect, 41, Bedford-row, W.C.:—

House.

Hook	£2,527	Wilkes Bros.	£1,696
MacIntosh	2,170		

Stables.

Wilkes Bros.	£950	MacIntosh	£813
Bush	873	Wilson	708

LONDON.—For rebuilding the "Queen's Arms" public-house, coach-house, and stables, Burrage-road, Plumstead, for Messrs. Courage and Co. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Stevens Bros.	£4,150	Whitehead and Co. ..	£3,850
W. Smith	4,073	Edwards and Medway	3,777
F. H. Hopkins	3,993	Hooper and Son*... ...	3,782
H. L. Holloway	3,896	Sheffield Bros.	3,515
Pritchard & Renwick	3,869		

* Accepted.

LONDON.—For new school at Cobbold-road site, Shepherd's Bush, for the London School Board. Mr. T. J. Bailey, architect:—

Martin, Wells, and Co.	£22,602 10	C. Cox	£20,833
B. E. Nightingale	21,830 0	Edwards & Medway...	20,744
Spencer, Santo, & Co., Ltd.	21,743 0	Wallis and Sons	20,489
J. and M. Patrick	21,674 0	J. Carmichael	20,488
Lawrance and Sons	21,198 0	C. Wall	20,298
Stimpson and Co...	20,990 0	Leslie and Co., Ltd ..	20,256
		Johnson & Co., Ltd.*	20,069

* Accepted.

LONDON, W.—For rebuilding the "Princess Victoria" Hotel, Uxbridge-road, W., for Messrs. Coe and Janes. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural.

W. Rowe	£8,720	Hooper and Son	£7,600
W. Tyreman	8,150	Pritchard and Renwick	7,460
Stevens Bros.	8,158	Courtney and Fairburn*	7,379
H. L. Holloway	7,786	G. Minter	7,296
F. H. Hopkins	7,733		

Fittings.

Brown and Co.	£1,398

Gasfittings.

W. Winn	£342 15

Pewtering.

Warne and Co. ...	£142 0 0	H. and F. Warne...	£125 0 0
T. Heath...	141 10 0	J. McPherson* ...	111 0 0
Buckley and Beach	130 13 6		

*Accepted.

LONDON, E.C.—For rebuilding the "Horse and Groom" public-house, St. John-street, Clerkenwell, E.C., for Mr. Dalton. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural Work.

W. Rowe	£3,920	Courtney and Fairbairn	£3,699
J. Tyreman	3,862	F. G. Minter	3,670
H. L. Holloway	3,831	Godson and Son* ...	3,640
Little and Senecal ...	3,790		
Hooper and Son	3,763		

Fittings.

W. Rowe*	£795

Gasfittings.

Christie and Son...	£156 7 6	Biggs and Co. ...	£123 7 0
W. Winn	138 5 6		

Pewtering.

T. Heath	£165	Warne and Co.	£145 0
Buckley and Beach ...	150	J. McPherson*	135 10

* Accepted.

LONDON, S.W.—For enlargement, new manual centre, &c., at the Honeywell-road Higher Grade School, Wandsworth Common, for the London School Board. Mr. T. J. Bailey, architect:—

Wall and Co.	£5,189	Garrett and Son	£4,420
White and Co.	4,736	E. Triggs	4,419
J. and C. Bowyer... ...	4,627	J. Appleby *	3,996
Stimpson and Co... ...	4,522		

* Accepted.

LONDON, W.—For a new section-house at Kensington, for the Receiver for the Metropolitan Police District. Mr. J. Dixon Butler, architect. Quantities by Mr. W. H. Thurgood:—

Holloway Bros.	£5,295	Leslie and Co., Ltd. ...	£4,725
O. Craske...	5,282	S. Hart	4,597
Grover and Sons	5,173	Messom and Sons ...	4,570
C. Ansell	5,140	B. E. Nightingale ...	4,545
Lawrence and Sons ...	4,998	W. Nash	4,390
Higgs and Hill	4,998	J. O. Richardson	4.179
Perry and Co...	4,896	Duffield and Son	—
Scrivener and Co... ...	4,779		

LONDON.—For providing a physical laboratory and balance-room, and for carrying out other works at Millfields-road Higher Grade School, for the London School Board. Mr. T. J. Bailey, architect:—

Williams and Son ...	£2,421	Grover and Son	£1,768
Munday and Sons ...	1,832	R. S. Buckeridge... ...	1,728
W. Shurmur	1,811	J. Appleby*	1,421

* Accepted.

LONDON, W.—For alterations at the "Masons' Arms" Tavern, Tichbourne-street, Edgware-road, W., for Mr. A. E. Wheatley. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural.

Stevens Bros.	£1,856 0	Little and Senecal.*	£1,236 0
E. B. Tucker	1,744 0		

Fittings.

Brown and Co.*	£745 0

Gasfittings.

Vaughan and Brown	£255 12	Biggs and Co.*	£224 5
W. Winn	224 5		

Pewtering.

H. and F. Warne ...	£87 0	J. McPherson	£79 0

* Accepted.

LONDON, W.C.—For rebuilding the "Horse and Dolphin" Restaurant, St. Martin's-street, W.C., for Mr. A. E. Wheatley. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural.

Stevens Bros. *	£2,457

Fittings.

Brown and Co.*	£552

Gas and Electric Light.

Buckley and Beech	£163 0 0	Biggs and Co.* ...	£133 10 6
W. Winn...	138 16 6		

Pewtering.

H. and F. Warue ...	£89 0	J. McPherson	£67 0
Davidson...	88 10		

* Accepted.

LONDON, W.—For rebuilding the "Beaconsfield Hotel," Blythe-road, West Kensington, W., for Messrs. E. J. Rose and Co. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural.

Lascelles and Co... ...	£6,874	Burman and Son... ...	£6,595
Little and Senecal ...	6,694	W. Rowe	6,512
Courtney & Fairbairn	6,675	Godson and Son	6,339
Pritchard & Renwick	6,660	Hooper and Son	6,286

Fittings and Shop Fronts.

W. Rowe	£2,118 10	Burman and Son ...	£1,660 0
Antil and Son... ...	1,880 0	Brown and Co. ...	1,622 0

Pewtering.

Warne and Co....	£169	Buckley and Beach ...	£139

Gasfittings and Electric Light.

Buckley & Beach...	£505 0 0	W. Winn...	£456 16 6

LONDON.—For sanitary and drainage works, already sanctioned by the Board, at Portland-place Higher Grade School, Mile End Old Town, for the London School Board. Mr. T. J. Bailey, architect:—

Munday and Sons...	£2,150 0	L. H. and R. Roberts...	£1,526 0
Killingback and Co.	2,065 0	Ashby and Homer...	1,522 0
Martin, Wells, and Co.	1,879 17	Falkner and Sons ...	1,383 0
Lathey Bros.	1,643 0	R. P. Beattie	1,380 0
F. Bull	1,571 0	Johnson and Co.* ...	1,185 0
G. Parker	1,557 0		

* Accepted.

LONDON.—For the erection of a school at Silver-street, Upper Edmonton, N., for the Edmonton School Board. Mr. H. W. Dobb, architect, 54 and 55, London Wall, E.C. Quantities by Messrs. Young and Brown, 7, Southampton-street, W.C. :—

		Amount included for Tar-paving Playgrounds, &c.
C. Gray Hill	£25,350	£2,350
Chessum and Sons	24,300	2,183
Stimpson and Co.	24,170	2,220
Hockley and Son	24,040	2,350
Lawrence and Son, Canal Works, Waltham Abbey* ..	23,399	2,189
A. Monk†	21,910	2,100

[Architect's estimate, £23,833.]

* Accepted. † Withdrawn.

RIDDLESWORTH.—For rebuilding Riddlesworth Hall, Norfolk, for Mr. W. N. L. Champion. Mr. H. J. Green, architect and surveyor, 31, Castle Meadow, Norwich :—

	£	s.	d.
Shillitoe and Son	£25,456	0	0
F. Bennett	25,022	13	4
J. S. Smith	22,888	0	0
Grimwood and Son	22,360	0	0
Youngs and Son, Norwich*	21,847	0	0

* Accepted.

RUNCORN.—For new house, Higher Runcorn, for F. A. Lake, Esq., Solicitor. Samuel Davies, M.S.A., architect and surveyor, Runcorn and Frodsham :—

Joseph Penny, Widnes (accepted)...	£1,091

SHEFFIELD.—For erection of shed, &c., Pinfold-lane, Attercliffe, Sheffield, for Messrs. J. Shipman and Co., Attercliffe Wine Mills. Messrs. Hall and Fenton, architects, &c., 14, St. James'-row, Sheffield. Quantities by the architects :—

	£	s.	d.
C. Roberts	£1,814	0	0
C. H. Gillam ...	1,700	0	0
H. Turton	1,650	0	0
T. Margerrison ..	1,650	0	0
B. Powell	1,525	0	0
E. Hancock ...	£1,515	0	0
Margerrison and Sons	1,407	2	0
J. A. Lenthall, Attercliffe-rd.*	1,403	15	6

*Accepted. [All of Sheffield.]

TAMWORTH.—For the erection of a new infants' school at Dordon for 250 children, for the Polesworth School Board. Mr. J. W. Godderidge, architect, Tamworth. Quantities by the architect :—

	£	s.	d.
Foster & Dicksee	£3,596	0	0
E. Williams ..	3,000	0	0
Clarson and Sons	2,899	0	0
T. Lord	2,670	13	9
J. Congrave ...	£2,608	12	8
W. and A. Heaps	2,570	0	0
Watton & Sons, Tamworth * ...	2,497	0	0

* Accepted.

[Architect's estimate, £2,410.]

THETFORD (Norwich).—For pulling down and rebuilding Town Hall. Herbert J. Green, architect and surveyor, 31, Castle Meadow, Norwich :—

	£	s.	d.
Kerridge & Shaw	£4,235	0	0
J. Youngs & Son	4,173	0	0
W. H. Brown ...	3,964	0	0
J. S. Smith	3,957	0	0
J. Shillitoe & Son	3,960	0	0
Willmott & Sons, Cambridge*	£3,935	0	0
Cornish & Gaymer	3,604	0	0
W. Boughton and Sons	3,493	0	2

*Accepted.

WEST HAM.—For rebuilding the "Odessa Arms" Tavern, Odessa-road, for Messrs. Courage and Co. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C. :—

Structural.

	£	s.
Hooper and Son ...	£3,995	0
Stevens Bros.	3,994	10
W. Rowe	3,929	0
Burman and Son ..	3,745	0
Courtney and Fairbairn...	3,629	0
Whitehead and Co. ...	£3,575	
Little and Senecal ...	3,558	
Pritchard & Renwick	3,542	
F. H. Hopkins*	3,539	

Fittings.

F. H. Hopkins*	£787

* Accepted.

WINCHESTER.—For additions to the High School for Girls, North Walls, for the Council of the School. Mr. Thomas Stopher, architect :—

Kimberley	£3,130
Rashley	2,983
Carter and Son, Winchester*	£2,962

* Accepted.

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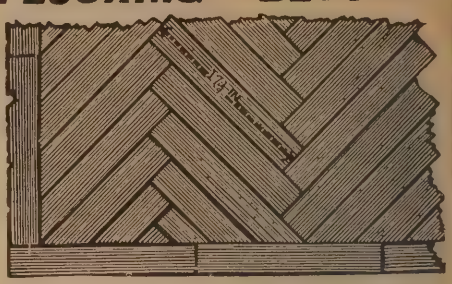

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17¼×3×1¼	6 9	6 1	9 1

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CONTRACTS OPEN.

TO BUILDERS and CONTRACTORS.

The Governors of the Hackney Institute are prepared to receive TENDERS for the ERECTION of WORKSHOPS at Cassland House, Cassland-road, N.E.

Drawings and specifications may be seen at, and copies of the bills of quantities may be obtained from, the offices of the Architect to the Governors, Mr. ALFRED W. S. CROSS, F.R.I.B.A., 58, Conduit-street, Regent-street, W., on the deposit of £5, which will be returned on the receipt of a bonâ-fide Tender. Tenders, addressed to the undersigned, will be received up to MID-DAY on MONDAY, AUGUST 14th next.

The Governors do not bind themselves to accept the lowest or any Tender.

PERCY KIRK,
Hon. Clerk to the Governors.

Cassland House,
Cassland-road, N.E.
July 31st, 1899.

PARISH of ST. LEONARD, SHOREDITCH.

TO BUILDERS.

The Guardians of the above-named Parish invite TENDERS for ALTERATIONS at one of the BLOCKS of their INFIRMARY, 204, Hoxton-street, N.

Specifications can be seen, and all information obtained at the office of Mr. F. J. SMITH, F.R.I.B.A., of Parliament Mansions, Victoria-street, S.W., upon payment of £5., to be returned to persons bonâ-fide Tendering.

Sealed Tenders, upon the forms supplied, must be delivered to the Guardians at their meeting to be held at the Board Room, 204, Hoxton-street, N., on WEDNESDAY, AUGUST 16th, 1899, at FIVE o'clock in the afternoon precisely.

The Guardians do not pledge themselves to accept the lowest or any Tender.

By order,
ROBERT CLAY,
Clerk to the Guardians.

Clerk's Office,
No. 213, Kingsland-road, N.E.
August 2nd, 1899.

ENFIELD SCHOOL BOARD.

TO BUILDERS AND CONTRACTORS.

The Enfield School Board invite TENDERS for the ERECTION of a BLOCK of SCHOOLS at Chase Side, Enfield.

Applications for bills of quantities should be sent to the Architect, Mr. G. E. T. LAURENCE, 181, Queen Victoria-street, London, E.C., before AUGUST 16th next, after which date the plans and specifications can be seen at the above-named address. A deposit of One Guinea should accompany the application, to be returned on receipt of a bonâ-fide Tender.

Sealed Tenders, on the form supplied, must be delivered at my office, free of charge, not later than TWELVE noon, on TUESDAY, SEPTEMBER 5th, 1899.

Persons Tendering will be required to sign an undertaking to pay the rate of wages, and observe the rules adopted by the London Building Trades Federation,

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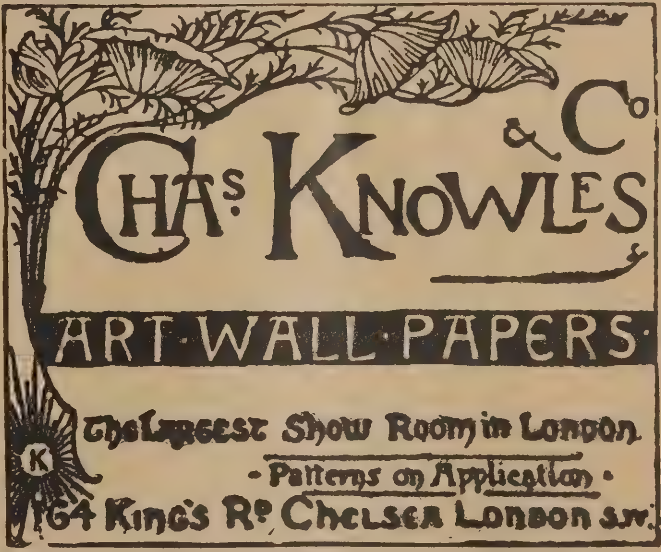
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By order,
N. HEPWORTH,
Clerk.

School Board Offices,
Court House, Enfield.
July 31st, 1899.

COMPETITION.

NORTHFLEET SCHOOL BOARD.
TO ARCHITECTS.

The Board invite PLANS for the ERECTION of SCHOOLS to accommodate 750 children; 500 mixed, 250 infants.

The architect whose plans are selected will be required to prepare detailed specification, and the plans and specification are to be subject to the approval of the Education Department.

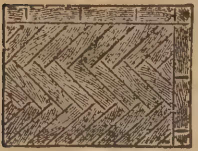
A fee of £15 15s. will be paid to the candidate whose plans are selected which shall be the absolute property of the Board.

Plans to be sent in not later than MONDAY, SEPTEMBER 4th.

The name of the architect is not to be placed on the design, but simply a non-de-plume, a copy of which should be placed in an envelope securely sealed and sent direct to me.

Further particulars of site and class of building required may be obtained on personal application to me.

FREDERICK MITCHELL,
Clerk to the Board.
No. 49, Windmill-street,
Gravesend.
July 26th, 1899.



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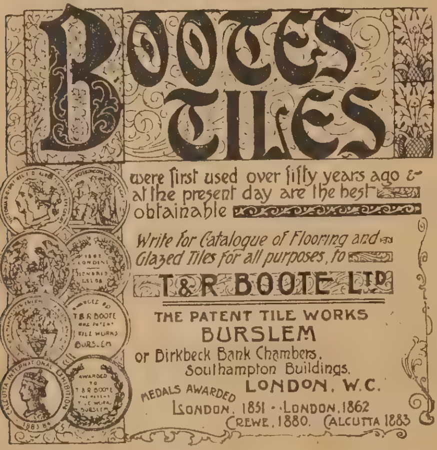

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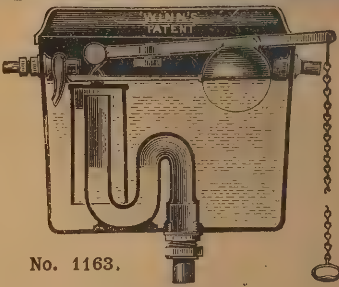

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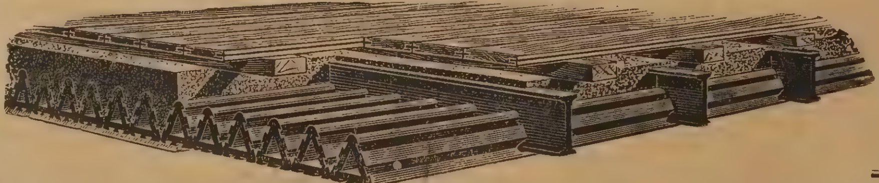

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THE VENTILATION OF SEWERS AND DRAINS.*

By R. READ, Assoc. M. Inst. C.E.

THE vexed question of sewer ventilation is a hardy annual, cropping up every summer when the weather is dry and warm, and most borough engineers put it on the list of things which "never would be missed." The subject bristles with engineering, legal, and sentimental difficulties which are unnecessarily complicated by people who have neither knowledge nor experience of the actual daily working of a system of sewers, who frighten the public by advertisements commencing with a long list of the evils supposed to be due to sewer gas, and wind up by a statement that these can all be avoided by using somebody's patent trap, cowl, disinfectant, or other nostrum at fancy prices.

History of the Subject.

Our modern systems of pipe sewerage are the growth of the fifty years since the Public Health Act of 1848, and very soon after that date Mr. Henry Austin, C.E., Engineer to the General Board of Health, the forerunner of the Local Government Board, made some experiments on the subject, which in 1852 resulted in a few ventilation openings being made into the sewers at the road surface at long intervals with a view to prevent the untrapping of closets, gullies, and overflow pipes from rain-water cisterns. In 1858 Sir Joseph Bazalgette and Colonel Heywood made some elaborate experiments with a furnace in the Clock Tower at the Houses of Parliament, in connection with the main drainage scheme for London. Since that date it has been generally recognised, with the one exception of Bristol, that ventilation is an absolute necessity, because, if provision is not made for the ventilation of sewers and drains they will ventilate themselves in a dangerous manner; and although it is stated that the Bristol sewers are not ventilated, this probably means that no provision has been officially made with that object in view, but, nevertheless, it is more than probable that the Bristol sewers ventilate themselves through the house drains by means of the rain-water pipes and ventilated soil pipes connected to the drains.

Results of Defective Construction.

Ventilation in the past has had to bear the blame of many things for which it was not responsible; that is to say, if a sewer is badly constructed and has not sufficient fall, no amount of ventilation will convert it into a good one, but the ventilation is often blamed for calling attention to the nuisance caused by such a sewer. However well a sewer may be designed and constructed, it may be converted into a sewer of deposit by badly constructed street gullies or by defective or neglected buckets for catching road dirt under the ventilated manhole grids. These defects allow road dirt to have access to the sewer, and wherever this occurs an obstruction is formed, round which the solid parts of the sewage accumulate and so form manufactories of sewer gas at short intervals along the sewer, which get worse and worse during dry weather.

Various Methods.

The most ordinary method of ventilating sewers is by ventilating the manhole and lamphole covers at the surface of the street at intervals, which commenced in the early days at about 300yds. apart, and were gradually made more numerous until some engineers put them as close as 40yds. apart, the idea being that the nearer the approach of the sewer to a continuous open cutting the better. These distances have since been modified until they now vary from 60 to 100yds. apart. During the last twenty years in some towns the street gratings have been closed, and vertical shafts erected against houses have been substituted for them, and in other towns combinations of street surface ventilators and shafts above houses have been used. Other forms of ventilation have been tried, such as connections to factory chimneys, or small gas furnaces, and gaslamps, and systems of deodorising sewer gas by means of charcoal and other chemicals have been tried in addition to or in substitution for the ventilation. As regards

Factory Chimneys

they create a very strong draught, and are useful in the case of a long line of sewer to which there are no connections, such as the Brighton outfall sewer, but otherwise they simply draw air in from the nearest opening; there is great risk of untrapping gullies in their immediate neighbourhood, and the required effect can be obtained by an ordinary shaft without the above risk. The gas furnace ventilators which are an imitation of the action of a factory chimney on a small scale and are supposed to draw fabulous quantities of air out of many miles of sewer, do nothing of the kind, but only draw in air from the nearest openings within a radius of about 100 yards. They are too costly to be applied generally, but are very suitable as special appliances for a very bad sewer which creates a nuisance at a particular manhole.

Deodorising Apparatus.

The application of costly apparatus containing charcoal and other chemicals for deodorising the gas, is of very little use; these are generally merely stoppers of the ventilation, an effect which can be more easily and cheaply produced by plugging the holes in the manhole covers. Ventilation to perform its legitimate work effectually must harmonise with the forces at work within and without the sewer, and it should not be called upon to deal with the foul exhalations from a badly designed and badly constructed sewer, but should be applied to well laid, properly proportioned, graded, and flushed sewers, in order to deal with the watery vapour arising from the surface of the quickly flowing sewage before it has time to stagnate and putrefy; but, however well the sewer may be constructed if the house drains and fittings connected therewith are not also properly constructed and flushed, they intermittently send down putrefying sewage which converts what would otherwise be a good sewer into an offensive one, and for which nuisance the ventilation and the surveyor get the blame.

Sewer Systems.

A system of sewers consists of a number of branch sewers converging into main trunk sewers, and discharging at one common outfall.

At intervals of every few yards along their whole length drains are connected to them on both sides, so that a sewer is a long perforated pipe, the complement or aggregate of a number of drains discharging into it. During periods of dry weather, the time when complaints of nuisance from the ventilators are most numerous, the discharges from the drains are intermittent, the sewage flow is at its minimum in quantity, and in its most concentrated condition. The flow in the sewers is continuous, but varies in quantity during every twenty-four hours, reaching its maximum in dry weather about 2 or 3 p.m., and its minimum about midnight or later according to the habits of the inhabitants of the particular town. Above the flowing sewage the sewers and drains are filled with air, and the sewage is about 800 times heavier than dry air, and more so when the air is charged with moisture, as it always is in a sewer.

What Takes Place in a Sewer.

Take the case of a well-laid pipe sewer, ventilated only by manhole and lamphole covers at the road surface, every house drain connected to the sewer having an intercepting trap fixed upon it. During twenty-four hours the sewer contains varying quantities of sewage, a non-compressible liquid flowing in one direction only, and also varying quantities of air, an elastic or gaseous fluid more or less saturated with watery vapour, filling the space above the sewage and in contact with it. If the sewer is to be self cleansing, the sewage should be travelling down the sewer at the rate of about 180ft. per minute, and at this velocity the friction between the flowing sewage and the air in contact with it almost invariably causes the latter to travel in the same direction as the sewage, but not at the same rate; this motion of the air is retarded by its friction against the crown and sides of the sewer not covered by the sewage and also by every opening into the sewer which it meets with; these in a sewer ventilated by this surface method only, may counteract the effect of the moving sewage, and the motions of the air are feeble, and little better than stagnation, except when there is a good wind. These movements may also be modified by differences in temperature between the sewer air and the outer air, but more especially in dry weather by the watery vapour always rising from the surface of the sewage; this which is a most important factor in sewer ventilation. The greatest complaints of nuisances from sewer ventilation always arise after about a week of hot and dry weather and the nuisance is most pronounced in the cool of the evening or during the fall of the barometer which precedes a change of weather such as a thunderstorm.

How Bad Smells are Caused.

During a hot, dry time the temperature of the outer air at the ground level may range from 50deg. F. up to 75deg. F. or 80 deg. F. in the shade during the twenty-four hours. The sewer air would range during the same period from 52deg. F. to 55deg. F., or a difference of only 3deg. in the sewer as against 25deg. in outer air. The outer air being dry has a great capacity for absorbing moisture, which doubles itself at every 27deg. F. increase of temperature, and dry air at 50deg. F. is 133 times heavier than watery vapour at the same temperature. Therefore the sewer air, although at a lower temperature than the outer air, is, by means of the admixture of watery vapour continually rising from the surface of the sewage, made lighter than the outer air, and consequently rises up every opening that it meets with; and if the temperature of the outer air is greatly in excess of that of the sewer, the watery vapour is immediately dispersed on rising out of the ventilator, and is not so noticeable. But if with the fall of the barometer or in the cool of the evening the temperature of the air at the surface of the road is reduced to the same or a lower temperature than that of the sewer air, the vapour hangs in a cloud in the neighbourhood of a manhole, and so comes in contact with the noses of passers by owing to its meeting with a stratum of air practically of its own temperature and density about 5ft. above the ground. If in such a case as this, in consequence of complaints, the manholes are closed, and grudging permission is obtained for only one or perhaps two shafts for a whole street, similar action takes place at a higher level, but the sewer is not so well ventilated, the friction is greater, and there is considerable risk of some of the intercepting traps being partially untrapped. In the upper length or dead end of a sewer there is not much sewage between the first pair of surface ventilators, and therefore the natural tendency of the air to rise vertically against the crown of the sewer may ventilate that particular length through the summit ventilator in an opposite direction to the flow of the sewage, and thus give rise to the popular delusion that the sewer gas from the whole length of the sewer rises towards the summit. If a sufficient number of shafts are erected against houses between each pair of road surface ventilators, all the road surface ventilators will then be converted into inlets, and the shafts into outlets, and the ventilation will be constant in one direction, because there is always more motion in the outer air at the top of a ventilating shaft, say, 30ft. above ground, than there is at the ground level; an up current is thus created in the shafts, each set of which are practically isolated, and supplied with air by the manhole on the upper side of them acting as an inlet, this arrangement being the only one which harmonise with the several forces above described. The only way to get a sufficient number of shafts to produce this result is to use every house drain as a ventilator by abolishing

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* A paper read at the annual meeting of the Incorporated Association of Muncipal and County Engineers, held at Cardiff, June 29th, June 30th, and July 1st, 1899.

The Intercepting Trap.

This useless obstruction to the flow of both sewage and air was invented by the late Mr. W. P. Buchan, of Glasgow, after the illness of the Prince of Wales in 1871, and they were introduced into the model by-laws issued by the Local Government Board in 1877, thereby placing an obstruction from 8in. to 10in. deep in the flattest part of every house drain, consisting of about three gallons of stagnant sewage weighing about 30lb., which cannot be entirely cleared with a six-gallon flush, notwithstanding that the improved forms of the trap have from 2in. to 4in. difference of level between the house and the sewer ends of the trap. They are practically cesspools for manufacturing sewer gas, fouling both the drains and the sewers. They do not effect their supposed object of being a safeguard to the houses, as this depends not upon the existence of the trap, but upon the soundness of the drain and its joints, and rapid removal of the sewage; and in these days, when the majority of drains are laid outside the houses, with cement joints, and tested with smoke and water tests before being used, there can be no possible danger in abolishing the traps, and allowing the drains to ventilate the sewers in the natural way previously described, this being the only method by which a sufficient number of shafts can be obtained for the purpose, and the formation of sewer gas prevented. There are other serious objections to the intercepting trap. It is very difficult to get the fresh air inlet into a position away from the doors and windows, where it will not be a nuisance, as every time the drain is used the inlet of the trap is converted into an outlet, and if it is provided with a mica or other valve to prevent this, the intercepting trap may have its water seal partially syphoned by the air. The result of the nuisance from the trap inlets is that many householders promptly close them, and the drain and intercepting trap is more foul than before.

Causes of Drain Stoppages.

If a stoppage occurs in a drain, it is generally at the intercepting trap, and frequent temporary stoppages occur in the trap, which are cleared by the sewage rising in the intercepting chamber until it gets sufficient head to force the obstruction, leaving a coating of putrefying sewage all round the brickwork of the chamber. The householder knows nothing of this stoppage at the time except by the foul air arising therefrom coming through the so-called fresh air inlet of the trap or being forced into the sewers and out through the manholes for the benefit of the public and the unfortunate surveyor. Another serious objection to the intercepting trap is the great waste of water it causes. The experiments by the Sanitary Institute in 1893 (Transactions, vol. 14), showed that even a three gallon flush left a deposit of 27 per cent. of solid matter in the traps at each discharge, and some more recent tests of 100 discharges from an actual drain specially laid from a mill at Stockport by Dr. Porter, the M.O.H. for Stockport, show that a six gallon flush would not clear a 6in. interceptor, and a three gallon flush would scarcely clear a 4in. interceptor.

The flushing of w.c.'s.

Those members of the Association who are water engineers as well as borough engineers will appreciate this point, especially if they have to keep the consumption down to sixteen gallons per head per day, as the author had to do for some ten years in succession. Thorough and real cleanliness should be the great object in view, and in this connection a hand-flushed closet is only a privy, and not a proper and sufficient water-closet as legally defined. A water-closet cannot be kept as clean as it should be unless it is provided with a properly constructed mechanical flush, and, if this is provided and the interceptor abolished, three gallons is an ample quantity of water for the purpose.

(*To be concluded.*)

Builders' Notes.

The Fireproof Partition Syndicate, Ltd. (Cumah-Wright system), have removed their offices from Billiter House to the larger and more convenient premises at No. 10, York Buildings, Adelphi. The company have also arranged for the erection of large works in the north of London.

Messrs. J. Stiff and Sons.—It is with much regret that we have to record the death, which took place on July 19th, of Mr. William Stiff, senior partner in the well-known firm of pottery manufacturers, Messrs. J. Stiff and Sons, of Lambeth. The business will continue to be carried on under the same style by the surviving partner of the original firm, Mr. Ebenezer Stiff, with the assistance of the three junior members of the firm, Messrs. Sydney J., James A. and W. Frederick, Stiff.

A Barry Carpenter's Claim for Compensation.—On Tuesday last week at Barry County Court, before his Honour Judge Owen, a claim was made by a carpenter against the Barry Graving Dock and Engineering Company for £50 for damages for the loss of a finger whilst in their employ. Plaintiff was engaged on March 10th last in planing a piece of wood on a machine which went at a rate of 2,400 revolutions a minute. In doing so one finger of the left hand was cut off and another injured. This was alleged to be due to a slight defect in the bedplate, which had taken place about three months before. For the defence a chargeman named Dunsford and Mr. W. J. Flowers, a foreman, by the aid of a model of the machine, stated that the accident must have happened on account of plaintiff not placing the guard on the bedplate in a proper manner, the latter being a quarter of an inch lower than the other side, whereas it should have been raised to receive the wood on a level after it had been planed. His Honour eventually gave judgment for the defendants, but pointed out that the action should have been brought under the Workmen's Compensation Act. Mr. Bailhache, for the defendants, said if that had been done the action would have been unanswerable, and it was agreed to adjourn the case for future mention before his Honour at the Cardiff Court on a point that the cost of the present action be deducted from the amount of compensation to be paid.

Erecting a Structure without the Requisite Licence. — At Lambeth Police Court, at the beginning of last week, George Davenport, builder, of Warner Road, Camberwell, appeared to answer an adjourned summons taken out by the London County Council, who complained that he, on or about May 12th, unlawfully set up at Kennington Oval a structure to which Part 7 of the London Building Act, 1894, applies, without having obtained the licence required by the Act.—Mr. Chilvers, for the London County Council, said the proceedings had reference to a stand which was intended for the accommodation of spectators at the forthcoming test match between Australia and England. It was intended to accommodate between 400 and 500 people. No application was made to the Council for a licence in connection with the erection of the structure, but the fact that the stand had been erected was brought to their notice, and an examination of the structure was made by one of their surveyors, who was of opinion that it was not fit for the purpose for which it was intended. The summons originally came before Mr. Hopkins, who adjourned it for three weeks upon the defendant giving an undertaking that the stand should not be used in the meantime. Since then the stand had been made in conformity with the Act, and a licence would now be granted. What he wanted to point out was that it was very important that such stands should be put up in a proper way.—Mr. Francis agreed that it was important.—Mr. Armstrong, for the defendant, said he understood that the Council would be satisfied with a penalty of 40s. and 42s. costs. The defendant would be prepared to pay that sum. Upon learning from Mr. Chilvers that he would be content with a settlement of the case on the terms suggested by Mr. Armstrong, Mr. Francis ordered the defendant to pay a fine of 40s. and 42s. costs, and expressed a hope that the stand would be ready in time for the match.

A Builder Charged with Damaging Houses. — At the Moot Hall Police Court, Newcastle, last Saturday week, Arthur Sturt, builder and contractor, was charged, on remand, with maliciously committing damage to certain house property at Gosforth (which he was building for Francis Elliott, of Heaton) to the extent of £50. Mr. Meynell, for the prosecutor, said that Mr. Elliott employed Sturt to build six houses at Gosforth, an agreement being entered into under which Sturt undertook to do the building for Mr. Elliott for £2,080. The agreement contained a clause, the substance of which was that under certain circumstances Mr. Elliott would have power to complete the work and employ labour, &c., at defendant's expense. There were certain complaints about the work, and, on July 21st defendant with a crowbar proceeded to remove certain portions of the building and knock it down, not in the ordinary way, but simply demolishing it. He began with the scullery, and afterwards proceeded to the front of the house and damaged the fittings, windows, sills, &c., doing damage to the extent stated. He smashed door panels, joists, rafters, and other things. He also did damage to two other houses which were built only to the first floor, and for the erection of which he had entered into an agreement for a sum of £660. Mr. Fisher, James Cackett, and other witnesses described the damage, more or less in detail. One of the witnesses stated that Sturt said that he wished Elliott would take him up. They had smashed him, and he would sue them for £1,000 damages. Then he would be all right. The chairman said that the Court were unanimously of opinion that the defendant had had no reasonable ground for acting as he had done, and he would, consequently, be sent for trial at the session, bail being accepted.

Omagh Roman Catholic Church.—Mr. Justice Kenny, sitting in the Record Court, was occupied on July 20th and 21st in hearing an action arising out of the building of the new Roman Catholic Church in Omagh. The plaintiff was Joseph Colhoun, builder and contractor, of Strand Road, and the defendants the Right Rev. Monsignor M'Namee and nine others, constituting the building committee. The plaintiff claimed £3,330 5s. 5d. for work done, services rendered, and materials provided, and also £1,030 9s. 9d. as damages for breach of contract, and in the alternative claimed a like amount for being wrongfully prevented from completing the contract. According to plaintiff, the original amount of the contract was £18,514 1s. 1d., of which he had been paid £15,300 on account. He claimed the balance, with interest from November last, in addition to the damages for breach of contract, as well as £54 11s. 8d. for the plant on the ground. The defendants traversed the various statements in the plaintiff's claim; averred that the amount of the contract was only £17,000; and the plaintiff was now only entitled to £2,366 10s. 2d. lodged in court. They also alleged that this £17,000 covered all the work ordered in writing by the architect, the late Mr. William Hague, of Dublin. Evidence was heard at great length, and his lordship submitted ten questions to the jury, and they found that £801 10s. 11d. and £47 9s. 11d. were due to the plaintiff over and above the sum lodged in court. According, however, to their answer to another question, extra works had been done without authority in writing from the architect, and upon this Mr. Drummond applied for a direction on the ground that the defendant was bound by the final certificate issued by the architect. His Lordship acceded to the application, directing a verdict for the defendants.

Surveying and Sanitary Notes.

A New Street in Leeds.—At last Wednesday's meeting of the Leeds City Council, it was decided to purchase certain property between Briggate and Lands Lane for the purpose of constructing a new street from Albion Place to Briggate. The new thoroughfare will cost £50,000.

Sewage Disposal at Chapeltown.—Last Wednesday morning, Colonel A. G. Durnford, R.E., Local Government Board Inspector, held an inquiry respecting the application of the Wortley Union District Council to borrow £12,100 for the purpose of a main sewer and sewage disposal for the sanitary district of Chapeltown.

The Opening of Clayton Sewage and Outfall Works took place recently. Mr. Asa Briggs performed the opening ceremony. The sewage mains have been laid by Mr. R. Wood, of Bingley, the tanks, &c., being built by Mr. J. Brigg, of Bingley. The tanks are built of salt-glazed bricks, with a stone coping, and are capable of holding 76,000 gallons. After the sewage has heen treated in the tanks, it passes to six large land filtration beds, comprising an area of 6½ acres. The whole works have cost £11,030.

Street Paving in Bradford.—The Bradford Corporation recently received sanction from the Local Government Board to borrow £100,000 for street paving purposes. The streets which it was proposed to deal with in course of time are part of Tyrrel Street, Chapel Lane, part of Market Street, New Ivegate, Booth Street, Hall Ings, Westgate in front of the Infirmary, Charles Street, Swaine Street, and Lumb Lane in front of the Infirmary. The laying of Chapel Lane with wood paving has already been carried out. Tyrrel Street, between Sunbridge Road and Thornton Road, is now in hand, and when the wood paving is laid the tram rails will also be laid for the purpose of bringing the terminus of the Great Horton tramway route nearer the town. Extensions in connection with the various tram routes are contemplated.

Connah Quay Sewerage and Street Improvement.—Mr. G. W. Wilcocks, M.I.C.E., one of the inspectors of the Local Government Board, sat at the Central Buildings, Connah's Quay, recently, to inquire into the application of the Connah's Quay Urban District Council for sanction to borrow £8,000 for purposes of sewerage and street improvement. Mr. Greer, in opening the case on behalf of applicants, stated that of the amount asked to be sanctioned £6,050 was for carrying out a system of sewerage, plans of which had been prepared by Mr. Beloe, of the firm of Messrs. Beloe and Priest, Liverpool. The sum of £378 4s. 2d. was required to pay certain expenses, &c., connected with an arbitration award made by Mr. W. Ambrose, Q.C., the arbitrator appointed by the Local Government Board to arbitrate between the new Urban Council and the late sanitary authority on a certain dispute. The amount of £1,100 was set down for compensation and street improvements, or to give the amounts separately, £1,000 was for compensation which would have to be paid to owners after carrying out the sewage scheme, and £100 was for street improvement. The remaining £471 5s. 10d. was to cover possible under-estimates and various costs incurred. After considerable evidence in opposition to the sewage scheme had been heard the inquiry closed.

County Council Business.—At the periodical meeting of the London County Council last week it was agreed, on the recommendation of the Improvements Committee, to contribute £4,400 towards the cost of widening Cheyne Walk, Chelsea, west of Battersea Bridge, at a spot known as Lindsey Wharf. The work is to be carried out by the Chelsea Vestry. On the motion of Mr. Dickinson, it was decided that the contribution should be made only on condition that the vestry should consent that the method of dealing with the jetty should form the subject of further consideration and report by the Improvements Committee. The Highways Committee recommended, and it was agreed to:—"That the estimate submitted by the Finance Committee for £10,000 be approved; and that the Council do authorise the expenditure by the Highways Committee of that sum for the preparation of plans, specifications, and estimates, and other preliminary expenses, in connection with the reconstruction, for the experimental use of underground systems of electrical traction, of that part of the London County Council tramways between Westminster Bridge and Tooting; and that the committee be authorised to make all necessary arrangements for the purpose above referred to." The Bridges Committee asked the Council to sanction an expenditure of £40,000 beyond the estimate of £74,000 for the acquisition of property required in connection with the rebuilding of Vauxhall Bridge. The committee explained that the excess had occurred chiefly on account of the excessive verdicts given on the claims of the Clothworkers' Company and Messrs. Francis and Co. These verdicts amounted to £46,786, the Council's valuation being £33,000. The cost of reinstating some warehouses on very expensive sites was responsible for the rest of the excess. After protests from Mr. Balian and others the excess was sanctioned.

Masters and Men.

Wellingborough Bricklayers' Strike ended last Wednesday, the masters having conceded the men's demands for 8d. an hour and more favourable working rules.

Danish Labour War.—Last Wednesday the management of the Joiners' Union at Copenhagen adopted, with slight amendment, the draft of a settlement which is the result of the negotiations which have been carried on between the union and the Employers' Federation. It is, therefore, thought that the lockout in the building and engineering trades will soon be terminated.

A Crane Accident.—In Hamilton Sheriff Court on August 1st an application by James Giffen, of 63, Low Glengowan, Strathavon, against Thomas Gilchrist, hotel keeper and contractor, Commercial Hotel, Strathaven, was heard under the Workmen's Compensation Act of 1897. The grounds given for the application were that on June 2nd, 1897, applicant was in the employment of Mr. Gilchrist, and was engaged in driving pipes in connection with the engineering work in the construction of a sewer. He had to convey these pipes to the railway station and place them in waggons with the help of a crane, and while engaged in this work he was struck by the crane. He contended that the railway station and waggons in which the pipes were being placed constituted a "factory" in terms of the Act. Defendant, on the other hand, argued that the case could not come under the Act. The case was adjourned.

The Building Trade Dispute.—The Executive of the Yorkshire Federation of Building Trade Employers met at Leeds on Tuesday last week, and considered the suggestion thrown out at the London Conference that an attempt should be made to settle the disputes still existing in various centres in the county, including Leeds, Hull, Huddersfield, Halifax, and Selby. After a very long meeting it was decided to appoint representatives of the masters to meet the head officials of the London Order of Bricklayers and the Amalgamated Society of Carpenters and Joiners. The master plasterers of Manchester and Salford met the operative plasterers and labourers last week with the idea of settling the dispute caused by the operatives insisting upon an advance of wages—the plasterers of 1d. per hour and the labourers of ½d. per hour. The masters offered the plasterers ½d. per hour advance and a further advance in twelve months, and the labourers were offered ½d. increase and in twelve months another ½d. The offers were refused by the men. The secretaries of the London Order of Bricklayers and the Amalgamated Society of Carpenters and Joiners telegraped to Leeds last week that it was impossible to meet the representatives of the Yorkshire Federation of Building Employers with a view to settling a number of local disputes in the country without the authority of their respective committees.

Engineers in Conference.—A conference was held at the Hotel Metropole last Thursday between representatives of masters and men in the engineering trades in reference to a wages dispute in Mid-Lancashire. Early in the year the men asked for an advance of 2s. per week. The masters, however, promised that they would concede 1s. advance in July if trade remained good. At the appointed time the men claimed the 1s., but the masters alleged that trade did not warrant the advance of even 1s. Mr. G. Clark (Sunderland) presided. The conference which sat for five hours, adjourned at seven o'clock without any decision on the point at issue being arrived at. Another conference was held last Friday, the result of which was that an umpire was selected to determine the question of the state of trade in mid-Lancashire as from April 1st to June 30th last. During the three months in which the umpire is forming his opinion of the state of the trade, an advance of 1s. will be given to the men, and if the umpire's decision is favourable to the men they will receive any arrears of the advance as from July 1st; but if the award is against them they will have to refund any increased wages paid to them.

Engineering Notes.

Municipal Electric Trams at Sunderland.—Messrs. Kerr and Co., of New York and London, have received a contract for the reconstruction of nine and a half miles of line, the construction of three miles of new line, and for twenty-six cars, at a price of £126,000. The system used will be the overhead trolley system, and the power will be supplied from the corporation electric light station. The corporation have bought out the present company for £36,000.

Electric Tramways in the Spen Valley.—Mr. Gerald A. R. Fitzgerald and Colonel Boughey, Light Railway Commissioners, held a public inquiry last week in the Co-operative Hall, Dewsbury, with respect to an application by the British Electric Traction Company for powers under the Light Railways Act, 1896, to construct a tramway from Dewsbury, through the Spen Valley, to Cleckheaton. It was explained that the length of the proposed light railway was about seven and a half miles all told. The gauge was to be 4ft. 8½in., and the method of working was to be by electricity by means of overhead wires on the trolley system. The line would commence at the south-western end of Ravensthorpe, and would pass through that district for a distance a little under one mile seven furlongs seven chains, into the borough of Dewsbury, where it would continue for about two miles. Thence it would traverse Batley to the extent of seven furlongs 4-8 chains, and come out into Heckmondwike, following the course of the Spen Valley from that point. After remaining in Heckmondwike for seven furlongs 1-2 chains it would pass into Liversedge, where it would run for one mile three furlongs 4-5 chains, and, after touching Gomersal, where it would only remain for five chains, it would run into Cleckheaton, where it would terminate after going a further distance of seven furlongs 1-5 chains. It was stated that the tramway would cost £55,631 to construct, or about £80,000 including electric equipment.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—		
Aug. 11	Aldershot—Alteration, &c., to Premises	J. Lazareck	Friend and Lloyd, Architects, Aldershot.
,, 11	Throckley—22 Cottages	District Co-operative Society, Limited	F. C. Charlton, Throckley.
,, 11	Rhyl—Intermediate School	....	F. H. Shayler, Architect, Welshpool.
,, 12	London, N.—Supply of Portland Cement	County Council	Manager, Works Department, Belvedere-rd., Lambeth, S.E.
,, 12	Bradford—Church	....	T. H. Healey and F. Healey, 42, Tyrrel-street, Bradford.
,, 12	Elgin—Residence	....	R. B. Pratt, Architect, County Bank House, Elgin.
,, 12	Londonderry—6 Alms Cottages	....	R. E. Buchanan, 33, Shipquay-street, Derry.
,, 12	Shiply—2 Villas, Stabling, &c.	....	R. Calvert, 4, Forster-square, Bradford.
,, 14	Ashwater, Devon—School and Master's House	School Board	S. Dockett, Clerk, Ashwater, Beaworthy, R.S.O.
,, 14	Coventry—Cloakroom, &c., at Schools	General Municipal Charities Trustees	H. W. Chattaway, Architect, Trinity Churchyard, Coventry.
,, 14	Kingston-on-Thames—Padded Rooms	Workhouse Guardians	W. H. Hope, Architect, Union Offices, Kingston-on-Thames.
,, 14	Wrexham—Hall, Shops, Workshops, &c.	....	T. Price, 77a, Lord-street, Liverpool.
,, 14	Leeds—Stone Fenders to Bandstands	Corporation	City Engineer, Municipal Buildings, Leeds.
,, 15	Baslow—Public Hall	....	E. M. Longsden, Architect, Bakewell.
,, 15	Batley Carr, Yorks.—8 Houses, &c.	Dewsbury Pioneers' Industrial Soc. Ltd.	Holtom and Fox, Architects, Westgate, Dewsbury.
,, 15	Dundalk—Post Office	....	H. Williams, Office of Public Works, Dublin.
,, 15	Eastleigh, Hants—Workshops	Eastleigh Weekly News	J. Cook, Architect, Eastleigh.
,, 15	Edinburgh—Works at Hospital	City Hospital	Public Works Office, City Chambers, Edinburgh.
,, 15	London, W.C.—Repairs, &c., to Workhouse	Strand Union Guardians	W. S. Cross and Kekwich, 18, Outer Temple, W.C.
,, 15	Tranmere—Additions to Science and Art School	Birkenhead Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
,, 16	Dinas Powis, Wales—Pair of Villas	J. Morgan	W. H. D. Caple, 1, St. John's-square, Cardiff.
,, 16	Workington—Altering, &c., Hotel	Cleator Moor Brewing Co., Limited	T. Eden, 58, Pow-street, Workington.
,, 18	Filey—Coastguard Buildings	....	Coastguard Station, Filey.
,, 18	Kirkwall, Orkney, N.B.—Coastguard Buildings	....	Watch Room, Coastguard Station, Kirkwall, N.B.
,, 19	Ashbourne—Union Offices	Guardians	Naylor and Sale, Architects, Iron Gate, Derby.
,, 20	Portsmouth—Decorating Room, &c., at Town Hall	Town Council	Town Clerk, Town Hall, Portsmouth.
,, 21	Southend—Technical Schools and Fire Station	Corporation	W. H. Snow, Town Clerk, Southend-on-Sea.
,, 23	Cilgerran, Wales—Bridge	St. Dogwells Rural Distict Council	D. Davies, Clerk, Quay-street, Cardigan.
,, 23	Clayton-le-Moors, Lancs.—13 Houses	Co-operative Society, Limited	J. W. Cooper, Secretary, Clayton-le-Moors.
,, 24	Rotherham—Converting to Shops	General Purposes and Parks Committee	J. Platts, Architect, High-street, Rotherham.
,, 25	London, W.—Repairs and Painting, &c., to Baths, &c.	St. Pancras Vestry	C. H. F. Barrett, Clerk, Vestry Hall, Pancras-road, N.W.
,, 30	Malvern—Sanatorium	Urban District Council	Surveyor, Council Offices, Malvern.
,, 31	Sunderland—Workmen's Dwellings	Corporation	Borough Surveyor, Town Hall, Sunderland.
Sept. 1	Malmö, Sweden—Electric Works	....	Clerk, Gasworks, Malmö.
,, 12	Croydon—Superstructure of Asylum	Town Council	Borough Engineer, Town Hall, Croydon.
	ENGINEERING—		
Aug. 11	Hartley Wintney, Hants—Filters, &c.	Rural District Council	Fairbank and Son, 13, Lendal, York.
,, 11	Preston—Bridge	Lancashire County Council	W. H. Radford, Bridgemaster, County Offices, Preston.
,, 11	Hensbridge, Somerset—Reservoir	Wincanton Rural District Council	C. Coombes, Engineer, Tisbury.
,, 11	Tarvin, Cheshire—Waterworks	District Council	H. B. Killon, 22, Cooper-street, Manchester.
,, 12	Biddulph—Water Supply	Urban District Council	C. R. Hall, 1, West-street, Congleton.
,, 12	Goole—Heating, &c., Public Baths	Urban District Council	F. Chambers, Surveyor, Goole.
,, 12	Ibiza, Spain—Harbour Works	....	Government of the Balearic Islands.
,, 12	Milford, Ireland—Sinking Wells, &c.	Rural District Council	S. Watters, Clerk, Board Room, Milford.
,, 14	London, S.W.—Gasholder	Wandsworth and Putney Gaslight and Coke Company.	H. H. Jones, Engineer, Gasworks, North-street, Wandsworth, S.W.
,, 15	Barking, Essex—Cast-iron Mains	Urban District Council	C. J. Dawson, Surveyor, Public Offices, Barking.
,, 15	Southwold, Norfolk—Pier	Coast Development Co., Limited	W. Jaffrey, 3, Victoria-street, London, S.W.
,, 16	Great Crosby, Lancs.—Tramway, &c.	Urban District Council	S. B. Cottrell, Overhead Railway, James-street, Liverpool.
,, 17	Carlisle—Electric Plant	Corporation	Prof. A. B. W. Kennedy, 17, Victoria-st., Westminster, S.W.
,, 18	Motherwell, Scotland—Electric Lighting	Commissioners	Prof. A. B. W. Kennedy, 17, Victoria-st., Westminster, S.W.
,, 19	Adlington, Lancs.—Sludge Works	Urban District Council	T. S. McCallum, 52, Corporation-street, Manchester.
,, 21	Blackpool—Electrical Equipment of Tramcars	Corporation	R. C. Quin, Corporation Electricity Works, Blackpool.
,, 22	Colwyn Bay—Electric Plant	Urban District Council	W. Jones, Town Surveyor, Council Offices, Colwyn Bay.
,, 22	Sophia, Bulgaria—Passenger Cars, &c.	State Railways	Commercial Department, Foreign Office, S.W.
,, 24	Plymouth—Outfall Sewer, &c.	Corporation	J. Mansergh, 5, Victoria-street, Westminster, S.W.
,, 28	Willesborough, Kent—Water Supply Works	East Ashford Rural District Council	Bailey-Denton, Son and Lawford, 9, Bridge-st., Westminster.
,, 28	Perth—Electric Plant	Lord Provost and Commissioners	W. C. C. Hawtayne, 9, Queen-street-place, E.C.
,, 28	Westbury-upon-Trym—Sewage Disposal Works	Barton Regis Rural District Council	A. P. I. Cotterell, 7, Baldwin-street, Bristol.
,, 30	Westbury—Reservoir, &c.	Rural District Council	W. H. Stanley, Engineer, Market House-chas., Trowbridge.
,, 31	London, S.W.—Crane, &c.	St. Mary's Vestry, Battersea	Vestry Clerk, Municipal-buildings, Lavender-hill, S.W.
Sept. 4	Belfast—Widening Dock	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Harbour Office, Belfast.
	IRON AND STEEL—		
Aug. 12	Rio de Janeiro—Steel Rails, Bolts, &c.	....	Manager, Central Railway, Rio de Janeiro.
,, 14	Leeds—Wrought-iron Fencing and Railings	Corporation	City Engineer, Municipal-buildings, Leeds.
,, 15	Nottingham—Pipes	Water Committee	S. Moore, Water Manager, St. Peter's, Church Side, Nottingham.
,, 16	Great Crosby, Lancs.—Steel Tramway Rails, &c.	Urban District Council	S. B. Cottrell, Engineer, Overhead Railway, James-street, Liverpool.
	PAINTING AND PLUMBING—		
Aug. 11	Abergavenny—Painting	Urban District Council	J. Haigh, Surveyor, Town Hall, Abergavenny.
,, 12	Nottingham—Painting	Estates Committee	W. Smith, Guildhall, Nottingham.
,, 12	Downpatrick—Plumbing	Rural District Council	J. W. Montgomery, Executive Sanitary Office, Downpatrick.
,, 19	Wolverhampton—Painters' Work	Lighting Committee	J. W. Bradley, Engineer, Town Hall, Wolverhampton.
,, 20	Portsmouth—Decorating	Corporation	A. Hellard, Town Clerk, Town Hall, Portsmouth.
	ROADS—		
Aug. 11	Wainfelin, near Pontypool—Street Works	Abersychan Urban District Council	Council Offices, Abersychan.
,, 15	Wembley—Carting and Materials	Urban District Council	C. R. W. Chapman, Surveyor, Council Offices, Wembly.
,, 15	Neath, Wales—Tar Paving	Town Council	Borough Engineer, Gwyn Hall, Neath.
,, 15	Felixstowe—Granite	Urban District Council	G. S. Horton, Surveyor, Town Hall, Felixstowe.
,, 15	Llandudno, Wales—Roads, &c.	Urban District Council	E. P. Stephenson, Surveyor, Church Walks, Llandudno.
,, 15	Romford—Granite	Urban District Council	Surveyor to Council, Romford.
,, 16	Burham, Kent—Approach	Parish Council	A. Neale, Burham.
,, 16	Derby—Street Works	....	W. Swindell, Surveyor, Imperial Chabrs., Albert-st., Derby.
,, 19	Colchester—Hire of Steam Roller	Lexden and Winstree R.D.C.	J. Ennals, Surveyor, Copford, near Colchester.
,, 21	Stevenage, Herts—Granite	Urban District Council	W. O. Times, Clerk, Council Offices, Stevenage.
,, 23	Royston, Herts—Kerbing, &c.	Herefordshire County Council	County Surveyor, 41, Parliament-street, Westminster, S.W.
,, 26	New Malden—Materials, &c.	Urban District Council	T. V. H. Davison, Engineer, Public Offices, Cambridge-road, New Malden.
	SANITARY—		
Aug. 15	Epsom—Sewerage Works	Rural District Council	Beesley, Son, and Nichols, 11, Victoria-street, Westminster.
,, 15	Witney—Drainage Works	Urban District Council	N. Lailey, 16, Great George-street, Westminster.
,, 16	Chester-le-Street, Sewers	Rural District Council	J. H. Mole, Surveyor, Dis. Coun. Offices, Chester-le-Street.
,, 21	Leigh-on-Sea—Town Sewerage Works	Urban District Council	Bailey-Denton, Son & Lawford, Palace-chbrs., Westminster.
,, 24	Plymouth—Sewerage Works	Corporation	J. Mansergh, 5, Victoria-street, Westminster.
Sept. 4	Lyme Regis, Dorset—Sewers	Town Council	Town Clerk, Town Hall, Lyme Regis.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Aug. 17	Batford—Sewerage and Sewerage Disposal Schemes	....	C. J. Spencer, Clerk to R.D.C., Public Offices, Batford, Notts
,, 17	Kirkcaldy—Joint Infectious Diseases Hospital	....	A. Beveridge, District Clerk, Kirkcaldy.
Sept. 1	Otley—Isolation Hospital	£30, £15	C. V. Newstead, Clerk, Wharfedale Union Joint Hospitals Committee, Union Offices, Boroughgate, Otley.
,, 4	Northfleet—Schools	£15 15s.	Clerk to School Board, 49, Windmill-street, Gravesend.
,, 15	Workington—Town Hall	£40, £20, £10	W. L. Eaglesfield, Surveyor, Town Hall, Workington.
,, 16	Norwich—Bank	£52 10s., £21, £10 10s.	Secretary, Norfolk and Norwich Savings Bank, C.E.Y.M.S. Rooms, Norwich.
,, 30	Tunbridge Wells—Designs in Tunbridge Ware	£3 3s., £2 2s., £1 1s.	Technical Education Committee.

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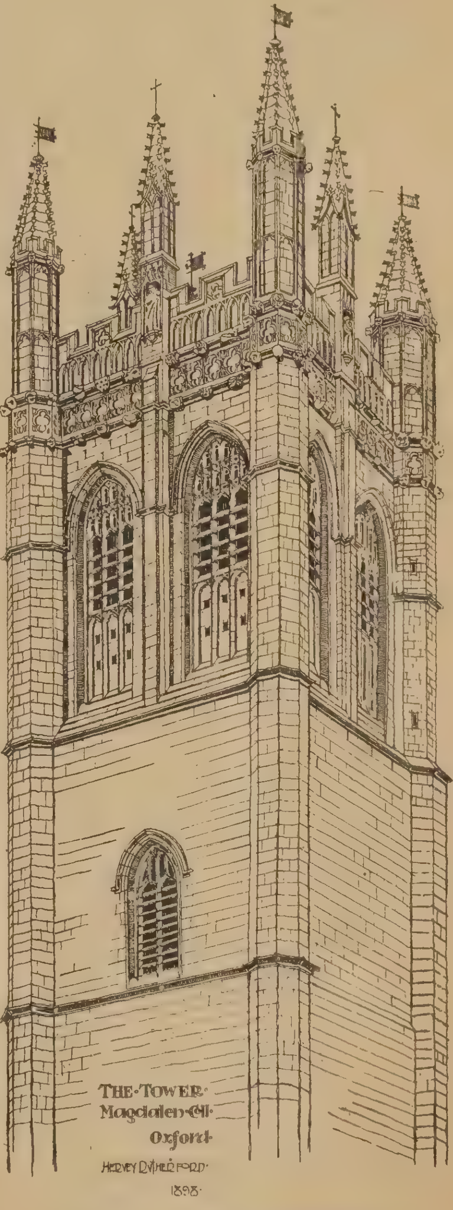
Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

Pictorial Design. In the production of a picture many processes are gone through before the completed work stands before the public to be appreciated or neglected, according to the individual spectator's taste. There is first the perception of subject, when a chance grouping of line, a telling effect of light and shade, or accidental combination of colour may catch the eye of the artist, or when a passage from some poet, historian, novelist, or dramatist sets his imagination afire and a pictorial vision rises before his mind, which he longs to realise. Then the sketch is made, and the design of the picture either fixed at once or hammered out and pieced together. Next comes the making of studies, which may be a long and tedious business, but (in modern practice, at least) is often carried out on the picture itself, which in that case generally has the representation of nature as its chief end, success in which means success for the picture. And here the difficulties of technique begin, which are so various as to form an unending chain of pitfalls for the unwary from commencing to completing the picture, with the additional gulf at the end, that if everything be foreseen and calculated for, the result often appears to be mechanical—a manufacture rather than an inspiration—and the charm which should be in every work of art evaporates. Painting is very much a matter of fashion, especially in a country like England, in which the feeling for art is not innate, but has to be carefully cultivated, and the modes of manipulation and treatment of subject, which at one period are all the rage, at other times are treated with absolute neglect. A glance over the art progress of the last thirty years will substantiate this assertion, or a study of the works of members of the Royal Academy in conjunction with the dates of their election. This body may be assumed to contain the most eminent professors of each phase at the time when it was fashionable, and furnishes a most valuable geological section of the variations of professional artistic opinion, from the lowest stratum in which fossils are found, to the most recent, which is scarcely yet consolidated, and does not afford a firm footing. The mode of manipulation should bear some sort of relation to the subject, as should the scale chosen for carrying out the design, for a trivial subject executed on a colossal scale bores the spectator, and a sense of incongruity is experienced when subjects of a highly poetic or religious type are treated in the latest manner now fashionable. There is among certain foreign painters an endeavour to imitate the mannerisms of the earlier artists, by placing scripture incidents amid everyday surroundings. It is forgotten that nothing is so sickening as the imitation of *naiveté*, and that even in the times from which they appear to take their inspiration it was not the custom to dress all the personages in costume which was then strictly modern. One often finds details of costume which were archaic at the time the picture was painted, in the midst of scenes apparently treated in the most realistic manner. The design of all pictures must be treated from one of two standpoints, either what may be termed the photographic or the panoramic. In the former the interest of the picture is focussed upon one point, and it is in this that the composition centres, and towards which the attention is directed, by all means which the painter has at his command. In the latter the interest has to be more evenly spread over the surface, so that the eye may travel with satisfaction from end to end. This form is that which is most suitable for decoration, the other being specially suited for easel pictures. It is unusual for an artist to be equally at home in both forms, the qualities of mind required for success being so different. As has been said the easel picture requires concentration of interest and effect upon one point, and, therefore, local exaggeration, while in the panoramic greater general grasp is required, the balance of masses and the spreading of the design in colour and line over the space to be decorated implying greater mental exertion. Another difference is to be found in the value of manipulative dexterity, which is of immense importance in the easel picture, but in decorative painting is much less necessary than the mental processes which have gone before the actual execution, and which guide the hand and eye to the production of works of great excellence; and while the easel picture may depend wholly upon manipulative dexterity for its interest, the decorative painter is forced to lay greater stress upon qualities of design, which may be so arranged that special prominence is given to one group, while others are kept in the background. The true decorator will choose the quality most in harmony with his intention, or with the surroundings of his work, or which may serve to correct them and bring everything into harmony. These special qualities may be suavity and beauty of line, beauty and impressiveness of silhouette, light and shade, arrangement of mass or arrangement of colour. It is not meant that any of these are destructive of each other, but that one or other being made prominent the remainder must necessarily be subordinate, for in all decorative art at all events there must be a governing idea, and it is as useless to attempt to combine two or three on an equality with each other as to produce a picture in which landscape and figures shall be equal in interest. All pictorial art depends upon sacrifice and selection, and even if it were possible to so paint as to make the spectator equally interested in the landscape and the figures contained in it, the result would only be mental confusion, a fall to the ground between the two stools. From the purely pictorial standpoint the form of composition and treatment should be selected to suit the mental impression it is desired to produce in the spectator, which may be suggested by the literary subject and may not. For instance, a picture by which the artist desires to excite the emotion of pity may contain uglinesses of form and delineations of squalor and muddiness of colour—so long as they are not enough to cause disgust—which would be quite out of place and offensive in one of which the subject was youth and spring. Again, if the subject is the relation of certain lines to each other, or contrasts of colour or tone, delicate or forcible, it is evident that absolute individual truth to either model or landscape is beside the question. The model, or the natural scene, is but the means whereby the poet, the maker, strives to set forth his vision, and the question is, is his mental conception clearly set forth, and are all parts of the picture in harmonious relation to each other? not—is it like individual nature? Looked at from this point of view realism and idealism no longer fight—that is to say, that every form of art is idealistic in so far as it is art at all. It has been contended that art lies solely in treatment or manipulation. It is true that a mean and sordid subject may be thus ennobled (and most of the subjects of modern life are mean or sordid), but the visions of beauty which the true artist beholds and strives to realise with the imperfect means at his disposal do not become art by his treatment of them, for his rendering lags far behind his vision, and the style which is considered to distinguish his productions is but the mode by which his personality strives to overcome the difficulties of expression. As with fainting steps he strains up the steep, difficult path, the higher he rises the rarer is the air, and he catches at every aid which may enable him to approach the summit of his desires. Design in a picture is one of the most valued and valuable aids to him in his struggle.

S. S. G.



DRAWN BY J. HERVEY RUTHERFORD.

Magdalen College, Oxford. Magdalen College is one of the most interesting college buildings of Oxford. It was built between the years 1474-1480, and has many fine features, notably the "Founder's Tower," with its beautiful oriel. This tower, illustrated above, is one of the most graceful of Perpendicular towers, and is about 145ft. high. Our illustration is from a sketch by Mr. J. Hervey Rutherford. This sketch was one of the set which took the Pugin Studentship prize at the Royal Institute of British Architects in January last.

"One Mile from London."

There stands, at the junction of the Exhibition Road, South Kensington, with Kensington Gore, a milestone bearing the now curious legend, "One Mile from London." The wayfarer who passes this crowded spot, where all day long the omnibuses make a continual procession, may readily observe this significant landmark, standing as it does, conspicuously against the dead wall that encloses Lowther Lodge, and the sight of it will be well calculated to arouse many thoughts in his contemplative mind, for it bears witness to the once existing notion that London began or ended, on its western side, at Hyde Park Corner, whence this relic is distant one mile. In those days, when the great Duke of Wellington was still living and residing at Apsley House, whose vast dingy bulk is still prominent at the Corner, that great building was, indeed, known as "No. 1, London," and was a convenient object at which to point when showing country cousins where London ended and the country began. There were no suburbs, as we in these latter days understand them; and once past Hyde Park Corner, the traveller of nearly two generations ago plunged into the country, past the village of Knightsbridge, and what was practically the country town of Kensington. As a matter of fact, the Kensington of that era was a great deal more countryfied than, say, Guildford now is, and fields and market gardens stretched away to the horizon where passionate Brompton and æsthetic Chelsea are now reckoned within the circle of fashionable London. It was, of course, the Great Exhibition of 1851 that first gave an impetus to building here, and drove the market-gardeners away. The village of Brompton was discovered by daring travellers from Mayfair, and land-speculators began to see that crops more profitable than cabbages or other domestic vegetables could be raised on these marches of the metropolis. Among them, Cubitt arose, and towering head and shoulders above his brother speculators, builders, and contractors, banished the broccoli to greater distances from London's ever-extending borders and pegged out huge building estates among the peas and the potatoes. Thus arose that once-typical South Kensington thoroughfare, the ineffable Cromwell Road, little less than half a century ago. That road, and its near neighbour, Exhibition Road, and Queen's Gate, exhibit the apotheosis of stucco. There are many roads, with houses more or less "palatial" in this neighbourhood, "one mile from London," but perhaps the culminating examples are the immense houses, one on either side of Albert Gate, which, when they were first built, were called the "Two Gibraltars," because it was thought they would never be taken. One became the residence for a time, before his downfall, of Hudson, the "railway king"; the other has long been the French Embassy. Happily, the era which built these dreadfully commonplace houses has passed. London has absorbed the early nineteenth century rural district once distant one mile from it, and it has been left for the last few years to see the compo porticos and pallid brick elevations of many of the once-admired Queen's Gate houses rebuilt in red brick and stone, by architects of the first reputation. Early and Late Victorian rub shoulders here in this quarter of museums, art galleries and mansions, and will serve to point a moral and adorn a tale for coming generations. Let us hope that not all the buildings of the Cubitt era will disappear. Let them remain, in part, as an example and a warning. C. G. H.

On Reflection.

The Wicked Restorer.

In last week's "Church Gazette" there is an interesting article on "Unrestored Churches," the writer of which declaims in vigorous style against the evil deeds of those who have taken in hand the restoration of our country churches. The author hails from Wessex, where he doubts if a single unrestored church is now to be found, and he implies that in every case "restoration" has been synonymous with desecration. "According to the view of the restorer," he says, "nothing can be worthy of preservation since the perpendicular period and little then, and because he does not know what the original builder intended he sets up what, out of his illimitable ignorance, he supposes they might have designed." Is it really so bad as that? We all know the excesses to which the Gothic revivalists of a past generation were led in their unrestrained enthusiasm, but in these days our architects have learned a little discretion. Our author certainly quotes some very bad cases, but he generalises somewhat rashly. Not every church restorer is a Vandal. While much of the work that has been done in the past is utterly indefensible, there are happily not wanting examples of restoration undertaken in a conservative and reverent spirit. After all a church does not fulfil its highest uses when it is merely a picturesque ruin, and the architect who, by the wise application of his art, arrests the natural process of decay, and preserves the fabric as a house for Divine worship as well as an interesting memorial of the past, is deserving of the thanks of the community: provided always his work is conceived and carried out in a spirit of reverent regard for the intentions of the original builders.

Electric Trams for London.

The advantages of electric traction over other kinds of mechanical power, and to an even greater degree over horse-power, have been by this time pretty clearly demonstrated. In many provincial towns, as well as in a great number of the most important Continental and American cities, electric trams have long been established and have proved completely successful. In this as in so many other matters London lags behind. The problem of the best system of traction is, it is true, a specially difficult one in London, but it is also specially urgent. The housing problem which bears so heavily upon the poor, and to a greater or less degree affects us all, makes it desirable that workmen should be enabled to live as far from the crowded centres of London life as possible. With cheap and rapid means available for transit to and from their work, larger numbers of workmen would be enabled to live in outlying districts where rents are cheaper and the air is purer. An electric tram might safely travel at a much greater speed (at any rate, in the less crowded streets) than the horse trams, and there is every likelihood that, if properly managed, the fares might be lower. We are glad to see that the London County Council have just taken the important step of inaugurating an electric tramway between Westminster Bridge and Tooting. The step is regarded as an experiment, but we have no doubt it will prove so successful that there will be no return to horse traction over this particular six miles, and that in other districts, as the tramways come under the control of the County Council, the same system will be adopted. The improvement of facilities for locomotion in London becomes every year a more urgent matter. Apart from the housing question, which is so closely dependent upon it, the increasing number of persons of all sorts and conditions who find it necessary to make their way to the City in the morning and return to their suburban homes at night, makes it more and more incumbent upon railway companies and tram and bus proprietors, to bestir themselves in the public interest. If, as we anticipate, the Westminster-Tooting experiment proves successful, an important step will have been taken in the direction of securing a better regulated system of locomotion for the metropolis.

The London School Board and Housing.

The housing problem in London is a sort of nightmare which troubles every public authority in turn. The London School Board is the latest victim. The Board wished to get rid of the problem by ignoring it, but that policy has proved a signal failure. We cannot pretend to much sympathy with a body which has brought its troubles upon itself by its evasion of a clear duty, though we sympathise with the ratepayers who will have to pay, probably, an enhanced rate. The Board has been under a statutory obligation, whenever it pulled down houses for the purpose of building a new school, to rehouse the displaced population in all cases where more than twenty houses were demolished at one time. By the simple expedient of not removing more than nineteen houses from a particular site in any one year, the Board has evaded its obligations in this matter. These disingenuous proceedings have now received a check. By an amendment to the Standing Orders, which has just passed the House of Commons, the Board will be obliged in future to find suitable accommodation for tenants of houses "liable to be taken" for the Board's purposes, as well as of houses actually demolished, and, in addition, it is called upon to build houses for a population equal to that it has displaced during the last five years—probably about 3,000 persons. It is possible, therefore, that we shall shortly see the School Board embarking—not willingly, but of necessity—in the work of building model dwellings. The Board, however, is hardly the authority to undertake such work itself with much prospect of success; its members have had no experience in this direction, and its Works Department is too small for such extensive operations. This is one of the cases in which the employment of a contractor is likely to answer better than the employment of direct labour, unless, indeed, the work is handed over to the Works Committee of the County Council, as one of the members has suggested. In any case it is satisfactory to know that the work of rehousing will no longer be neglected as it has been in the past. The attitude of the School Board seems to have been: "We are elected to look after the education of the children, therefore let us not trouble about anything else." But in the present acute state of the housing problem, and the absence of any large and statesmanlike proposals for dealing with it, it is the duty of every public authority to take upon itself some share of the burden. At any rate the problem is not to be solved by being shirked.

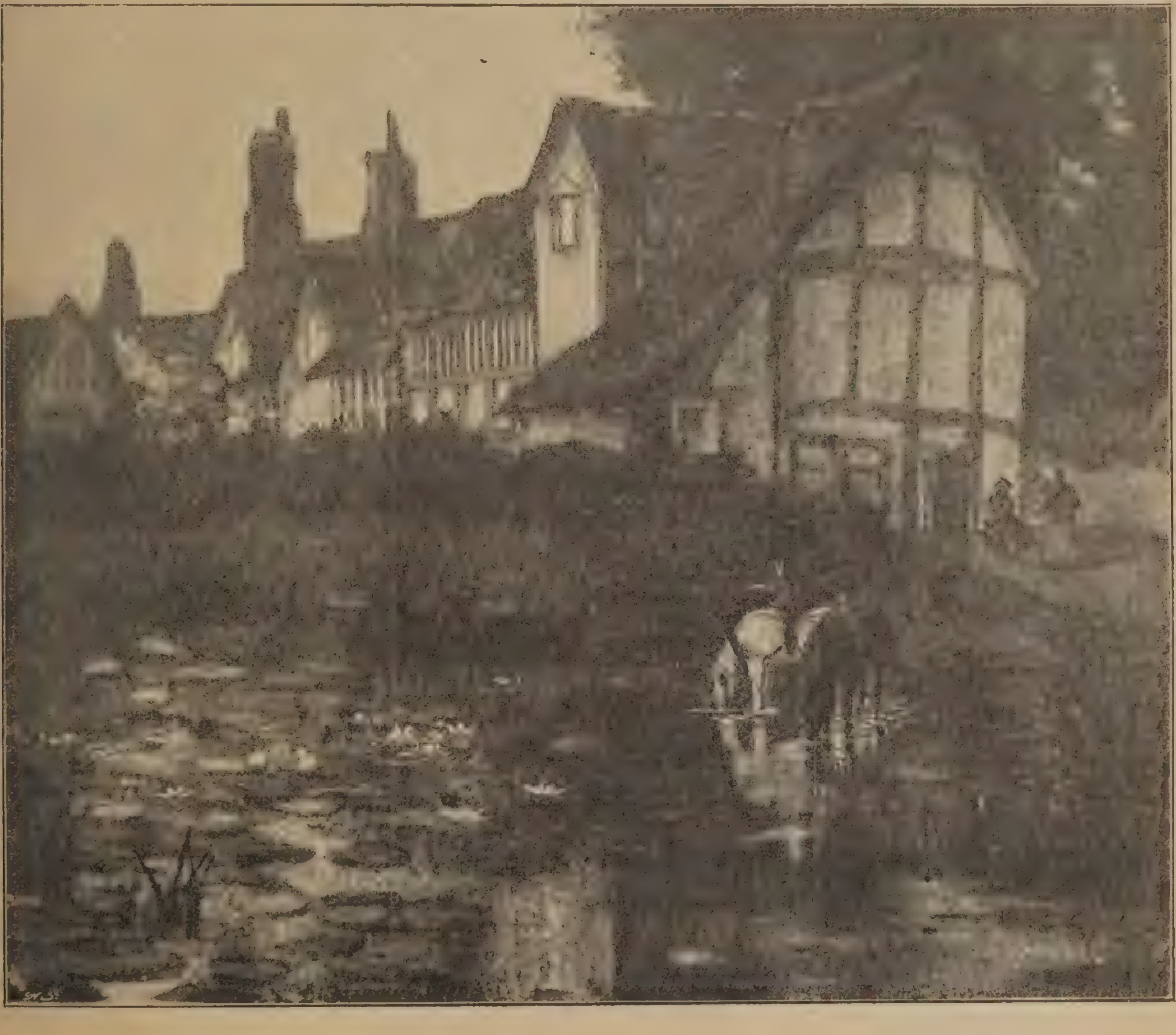
HALF-TIMBER HOUSES.

THE illustration appearing on this page is of a very picturesque group of old half-timber farmhouses, roofed with thatch, situated a few miles from Hemel Hempstead. These homes, suggestive of peace and contentment, are similar to many other half-timber houses in the locality. Mr. William Aikman's water-colour drawing, from which our illustration is taken, shows this well-known designer of stained glass as a most capable draughtsman.

Perhaps what is most pleasing about these houses is their simplicity ; the panels of plasterwork are large, and separated by fairly large timbers. It generally happens that the more simple specimens of this most interesting style of building are ignored, and attention is directed only to such buildings as Moreton Old Hall, the well-known houses at Chester, and Trewern Hall in Montgomeryshire, where the panels are small, and loaded with small, and often carved, woodwork. Although this more minute work is more interesting than the plainer kinds, these latter are worthy of most careful study. It is a very common thing for the woodwork to be entirely plastered over, but even then the examples should not be lightly passed over, for they often present studies of good proportion and picturesque grouping of parts. Proportion and grouping are too often absent from modern work in this style. It is stated that there are no cottages in England more than 500 years old, and that those of undoubted antiquity which still remain owe their durability to the fact that they were built mainly of oak. The picturesque irregularity of many of these groups of cottages along the wayside is due to their being built in accordance with a statute of Queen Elizabeth's reign, which ordained that every cottage, with some few exceptions, should have a full portion of land on all sides.

Pure half-timber work seems now to be falling into desuetude, the only use being for that horror of modern suburban buildings, the half-timber gable, the remainder of the building being generally entirely of brick or stone. By using half-timber in this way a building becomes a medley most distressing to the eye. Much of this usage is no doubt due to the London Building Act by-laws, by which it is ordained that practically no half-timber must be used, except in dormers and such like. One can readily appreciate the wisdom of prohibiting thatch in order to obtain both safety from fire and more sanitary roofing material, but there seems to be no good reason for the prohibition of pure half-timber work, considering the number of fire-resisting materials on the market and the present superior methods of construction.

An article, written by Mr. W. A. Mellon, upon half-timber houses appeared in our issues for December 15th and 22nd, 1897, and should prove of considerable service to any one interested in this method of construction, and desirous of making some study of it.



HALF-TIMBER FARMHOUSES AT HEMEL HEMPSTEAD. FROM A WATER-COLOUR DRAWING BY WILLIAM AIKMAN.

WITH GREEK BUILDERS.

I. — ARCHITECTURAL PRACTICE AND BUILDING MATERIALS.

By JOHN A. MARSHALL.

> *"The school of the Grecians still remains open, my friend—years have not barred up its doors."*
> —Goethe.

LET us enter, then, yet once again, for no other art is so full of healthful teaching, especially for these days of restless striving, when the encroachments of science—as killing as the canker to the rose—are eliminating from our architecture all that is most valuable. Breadth, dignity, permanence—the outcome of simplicity and restraint—are qualities rarely met with in modern work. It is indeed refreshing to look at a block of Pentelic marble as fashioned by the Greeks. How massive the stone! what tenderness in the detail! while the glittering play of light on its crystalline surface shows the material to be worthy of the workmanship.

The value of permanent strength, combined with architectural beauty, for which the buildings of ancient Greece are pre-eminent, is due to the simplicity of the construction, and to that sense of "fitness and measure" which distinguishes all Greek achievement. It should also be borne in mind that for centuries the Greek architect worked under what may be termed a healthful restraint, for his efforts were mainly directed to perfecting the proportions and details of unalterable types. This restraint, it may be mentioned, was in a measure enforced by the isolation of the Greek communities, and by the national character of their religion. These remained practically unchanged from at least the time of the Homeric poems to the conquest by Philip of Macedon. 'Tis true that during the century preceding the last-named event the philosophers had sought a higher teaching than that afforded by the popular mythology, and the faith in the Homeric Pantheon began to wane, yet, notwithstanding this, the religion remained essentially national.

When the independence of the Greek States was threatened by Philip, the individual, rather than the State, was fast becoming the unit of social life. The orator Demosthenes clearly saw this, and, in one of his attempts to rally the Athenians to a sense of their public duty, he brings the fact home to them in a very striking passage. "In former times," he says, "the State herself was wealthy and flourishing, and no individual was raised above the multitude. Is poof wanting? Whoever knows the style of house which Themistocles had, and Miltiades, and the illustrious of that day, perceives it to have been no grander than that of the multitude, while the public structures and edifices are so magnificent and beautiful that room is not left for any succeeding generation to surpass them: Yonder, gateways, docks, porticos, the Piræus, in fact all the buildings by which you see the city adorned. Now, each of your statesmen has a private fortune so immense that some of them have built their houses more splendid than many public edifices, some have bought up a quantity of land, more than all you in the Court have amongst you, while as to the State buildings which you put up and whitewash, I am ashamed to say how paltry and miserable they are!"

The loss of Greek independence was followed by the introduction of foreign cults, and the spread of science; new creeds were established, while unbridled scepticism flourished. The practice of architecture became an ostentatious display of skill, which the hand of Time has long since obliterated, but the works so much admired by Demosthenes still remain.

In the republics of Greece the construction and management of the public buildings was undertaken by the State, each city being usually an independent community, having no political union with its neighbours. It may be well, however, to bear in mind that the district of Attica formed an exception; there the various cities and townships constituted a single state, and recognised Athens as the seat of supreme power.

To direct the public works, an official building committee, termed the *epistatæ*, was appointed for a term in each city. This committee was assisted by a superintending architect, who, it should be noted, is to be distinguished from the architect of the building. Thus Plutarch tells us that the sculptor Phidias was appointed by Pericles to superintend the public buildings of Athens, and that he had the direction of everything, and all the artists received his orders, although the Athenians had other eminent architects and excellent workmen; but we must not infer from this that the architects of the Parthenon and the Propylœa were not entirely responsible for their works. In all probability, the supervision by Phidias—in the case of the Parthenon—was limited to the requirements of the cryselephantine statue and the Panathenaic frieze.

To superintend the building of the Erectheion, a committee was appointed (in 409 B.C.), consisting of five members, including an architect named Philocles, of Acharnæ. The architect of the building is not known.

It was the custom, as in these days, to entrust the erection of a building to contractors, though occasionally the State dealt directly with the workman, an arrangement adopted for portions, at least, of the Erectheion. Very large works were sometimes divided into sections, each section being let to a different contractor, or only a part of the work was contracted for at a time. Thus for a large temple at Lebadea, in Boeotia, a contract has been found which refers to a portion of the stylobate only.

The materials for public buildings were mostly supplied by the State, the principal quarries being under its control. For Athens the main sources of supply were the marble ranges of Pentellicus and Hymettus.

The Pentelic marble was the most durable, and after the Persian wars it was almost exclusively used for the buildings on the Acropolis. The quarries from which it was obtained may still be seen, though doubtless their original aspect has been somewhat altered by the Romans, who used them largely. They are approached by a steep ascent, roughly paved with transverse blocks, so that the stones could be brought down to the valley on wood slides. The blocks were probably first scalped into shape at the quarries, to reduce the labour of transit.

The marble of Mount Pentellicus is composed of nearly pure carbonate of lime, though interspersed here and there with veins of schist. It is very hard, and of a coarse crystalline texture, which makes it difficult to work. When being roughed down, it emits sparks, and the tools are quickly blunted. The action of the weather on the surface eats away the softer veins of schist, leaving the hard parts standing out; this effect may be seen in the sculptures from the Parthenon. The mellow tint which this marble assumes with age is due to oxidisation.

Other quarries were situated in the Peiraic peninsula, from which a coarse limestone was obtained for ordinary work and foundations. A dark limestone from Eleusis was also used for special purposes, and marble from the islands of Paros and Naxos for roof tiles. When marble was not used the coarse stone was sometimes coated with a very fine hard stucco, made of lime and powdered marble, which took by polishing a surface similar to that of marble. The stonework for the temples at Cornith, Aegina, Delphi, and Olympia was so treated.

At Delphi (530 B.C.), according to the contract, the temple was to have been built entirely of rough limestone from Mount Parnassus, but the contractors, at their own cost, made the columns for the front of white Parian marble, the rest of the work being covered with stucco.

Another remarkable instance of the use of different kinds of stone in the same building is the temple at Phigaelia. Here the walls, columns, and entablature were built of a grey compact limestone, not coated with stucco (see a cap in the British museum), while the ceiling beams, and lacunaria, the capitals of the interior, the sculptures, the tiling, and the guttæ on the soffit of the corona were of marble. Professor Mahaffy tells us that the pillars of this building have become curiously wrinkled with age, caused by the grain of the limestone running across the flutings; the ground colour, he says, is a pale greyish blue, but the lichens which invade the stone have varied the fluted surfaces with silver, with bright orange, and still more with a delicate rose madder.

For the arsenal of Athens, at Zeia (346 B.C.), we learn from the specification prepared by Philo, the architect, that the walls were to be of Peraic stone, which could be quarried at hand; the columns inside, and the thresholds and ceilings of the vestibules, were to be of Hymettic stone; while for the caps of the columns, and the casings and lintels of the doorways, Pentelic marble was to be used. There are no remains of this building, but the plan can be made out from the inscription. The length was no less than 400ft., and the width 55ft. The building was divided into three aisles, by two rows of columns. The side aisles were reserved for the storage of tackle, while the central aisle, which had a doorway at each end, was used as a thoroughfare.

In considering some of the structural details of Greek buildings, it will hardly be necessary to remind the student that, to receive the peristyle and cella walls of a temple, a raised platform, or stylobate of masonry, was always constructed, and for this the site had generally to be levelled or made up. Thus, for the archaic temple on the Acropolis at Athens, close to the Erectheion, the rock was cut away for the south-east angle of the stylobate, but on the north-west an artificial foundation of solid masonry was raised about 10ft.

At Aegina and Delphi the platform was extended considerably beyond the area occupied by the temple, so as to form in each case a spacious peribolos. In the former, the platform is partly on the rock and partly built up of large stones; it was paved with two thicknesses of square slabs. At Delphi, the paving of the substruction is in part supported on piers over 6ft. in height, which are connected by walls, forming a network of cells; the whole is enclosed by a massive retaining wall of closely-fitting polygonal masonry, against which winds the "sacred way," made familiar to students by the French excavations. The student may also be reminded of the allusion in that delightful play, the "Ion," of Euripides, where Creusa leads the old man up the winding path to the temple.

The substruction of the Pantheon is well-known, on account of the controversy respecting its date; and the bastion-like projections for the lateral compartments of the Propylœa will readily recur to the mind.

When the site was a natural plateau of rock, the area covered by the temple was not, as a rule, levelled throughout, but merely around the stylobate, and continuous trenches were sunk for the foundation, leaving the ground within the temple undisturbed, where it did not interfere with the bedding of the paving. At Assos, in the Troad, for instance, the volcanic rock on which the temple stood was found in places nearly flush with the floor, and is supposed to have been covered with stucco. At Segesta, the red limestone rock in the cella protrudes above the level of the stylobate paving, but the cella was never built, and the ground around the temple had not been levelled, only the space on which the peristyle stands. The situation of this ruin must be very impressive. A description of Goethe's, in a letter dated 1787, almost takes us to the spot. "At the highest end of a broad and long valley, it stands on an isolated hill—surrounded, however, on all sides by cliffs; it commands a very distant and extensive view of the land, but takes in only just a corner of the sea. The district reposes in a sort of melancholy fertility. Flowering thistles were swarming with countless butterflies; wild fennel stood here from 8ft. to 9ft. high, dry and withered, of the last year's growth. A shrill wind whistled through the columns as if through a wood, and screaming birds of prey hovered around the pediments."

The Early Doric temple at Corinth is another instance where the area covered by the building had not been reduced to a level, nor were the foundations of the peristyle continuous, but a distinct bed was sunk in the rock for each column, and trenches were sunk for the walls. The lowest step of the stylobate was hewn out of the rock.

Before closing this section of our subject, we may refer to Pliny's account of the preparations for supporting the great Temple of Artemis, at Ephesus. He says:—"A marshy site was selected, in order that the temple might not suffer from earthquakes; and that the foundations of so vast a pile might not have to rest upon a loose or shifting bed, layers of trodden charcoal were placed beneath, with fleeces covered with wool on the top of them."

When Mr. Wood excavated the site some years ago, he was naturally curious to know if Pliny's statement could be verified, but, unfortunately, he was unable to dig down to the necessary depth, as the excavations were flooded; he, therefore, bored through to the natural soil in several places, and found it to be alluvium, composed of sand and water-worn stones. On the top of this was a layer, 4in. thick, of a substance resembling putty or fine mortar, then a bed of charcoal 3in. thick, and again a layer of mortar 4in. thick. On this platform the foundations of the archaic temple were built. The stylobate of the latter temple was raised some 7ft. 6in. above the floor of the early temple, and the columns were built on piers stiffened by connecting walls, so that the weight would be evenly distributed.

Although Pliny does not mention the use of piles, yet we cannot be certain that they were not employed here, as in later Roman times; and on this head we may be permitted to quote "Vitruvius," who says: "If the ground be loose or marshy, the place must be excavated or cleared, and either alder, olive, or oak piles, previously charred, must be driven with a machine as close to each other as possible, and the intervals between the piles filled with charcoal. The heaviest foundation may be laid on such a base."

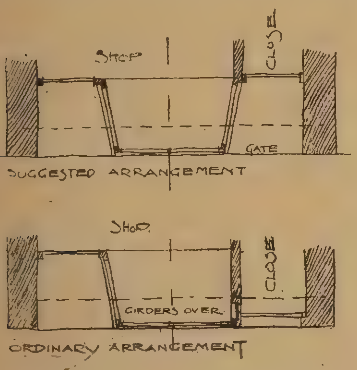
(To be continued.)

SHOP FRONTS.*

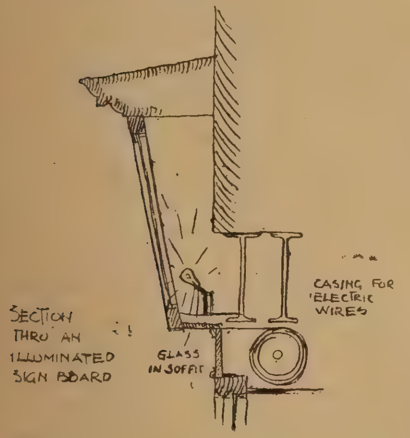
By JAMES LOCHHEAD, A.R.I.B.A.

(Concluded from page 10, No. CCXXXV.)

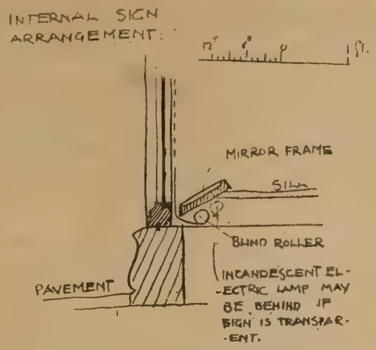
WHEN on the subject of oriels I have illustrated a simple means for treating a shop window with close adjoining in this wise: Where instead of the usual method of carrying out the brick dividing wall to the face of front wall, a convenient and attractive window, and at the same time a shortened "close," can be obtained by repeating the angle of shop door ingoing on the opposite side of window.



TREATMENT OF FRONT WITH CLOSE ADJOINING.


CASING FOR ELECTRIC WIRES
SECTION THRO' AN ILLUMINATED SIGN BOARD
GLASS IN SOFFIT

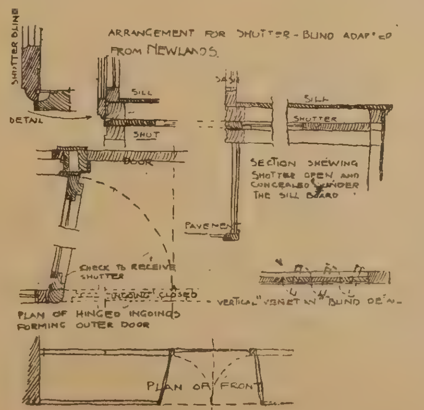
In addition to the architectural evils and difficulties incumbent upon the introduction of large plate glass fronts, other disturbing influences force themselves on one's notice, one of which is the necessity of protecting this large surface from the sun by making provision for sun blinds. This, however, in one of its solutions involves a consideration of the signboard, about which a great deal remains to be said. The tasteful display of the vendor's name is not so much a matter of consuming interest to that individual as the attractiveness thereof, still the architect can do much to render the signboard, as one of the "trifles which make perfection," at once attractive and artistic. It is true that in many cases there is not much inducement to bestow labour on this adjunct, when we see even the most respectable of them at times totally obliterated—and no inconsiderable part of the building as well—by huge posters testifying to some clearance sale and marvellous bargains, a feature which, if it must be tolerated, might also be considered worthy the architect's consideration.


INTERNAL SIGN ARRANGEMENT:
12" 6" 0 1 ft.
MIRROR FRAME
SILL
BLIND ROLLER
INCANDESCENT ELECTRIC LAMP MAY BE BEHIND IF SIGN IS TRANSPARENT.
PAVEMENT

Why should a signboard be tilted as we so often see it? In some cases this is no doubt due to a constructive expedient to support oriels or some projection over, but the alleged advantage to "the man in the street," in so far as "he who runs may read," is questionable, as is also, to my mind, the appearance. Standing on the opposite side of the street, lettering upon a flat surface is as legible as on an inclined plane, while from the edge of the nearer pavement the one serves its purpose as efficiently as the other, in addition to which other means of announcement to the close observer could be devised, to which I shall refer.

It is a customary practice in the before-mentioned instance of a series of shops to have the board extending right along over closes and shops alike without break or interval, except by the ludicrous line of demarcation afforded by the joinings of colour favoured by the respective vendors. It is more satisfactory to let each shop sign stand for itself, and begin and end over the daylight, forming a frame wherewith to contain the desired announcement.

Of course, the boards must of necessity extend the full length, but in this case also it stands for itself, and does not involve any other feature. I may explain my meaning in this connection by alluding to a signboard at the Trongate, grained an impossible mahogany, where the shop-keeper has made everything to match by converting the stone cornice above into the same extravagant material! The wooden sign is almost a *sine quâ non* where iron beams come in behind, with a few exceptions in the case of glass, mosaic, modelled plaster, or the skeleton sign before referred to. The reference to glass recalls one method of making an effective announcement by means of an electric light behind a glazed signboard, upon which the transparent letters in red were shown up against an opaque background. Modelled plaster in the shape of some flat decoration has been used successfully in America; it enhances the appearance of the window and emphasises the name—which, by the way, ought to be executed in good lettering—an item not above the architect's attention.


ARRANGEMENT FOR SHUTTER-BLIND ADAPTED FROM NEWLANDS.
SHUTTER BLIND
DETAIL
SILL
SHUT
DOOR
SASH
SILL
SHUTTER
SECTION SHEWING SHUTTER OPEN AND CONCEALED UNDER THE SILL BOARD
PAVEMENT
CHECK TO RECEIVE SHUTTER
INGOING CLOSED
VERTICAL "VENETIAN" BLIND OPEN
PLAN OF HINGED INGOINGS FORMING OUTER DOOR
PLAN OF FRONT

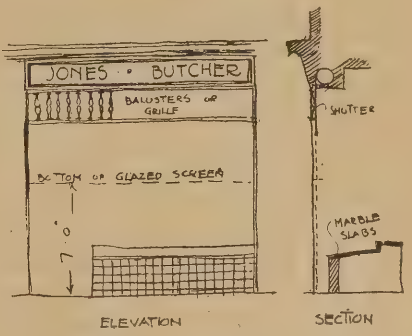
I referred to the necessity for announcements to the close observer; this has been successfully accomplished by means of an improvement of the old brass plate arrangement over the stall board—which, by the way, should be kept back from the line of front out of the reach of people's feet. By putting a plate inside the window immediately behind the same, an easily read announcement is provided, damage to goods by condensation is avoided, light goods are kept a desirable distance back, and a blind roller can be obtained underneath.

This provokes a return to the subject of blinds. The most common consists of a roller behind the signboard, part of which is detachable, and supported when extended upon adjustable arms attached to the wall. In Neulands "Carpenters' and Joiners' Assistant" a diagram of a shop front is given, which likewise affords a suggestion for a treatment of shutters which might be used in connection with the common vertical Venetian blind arrangement. Here the blind after having collapsed, goes under the sill of the window.

The same diagram also indicates an idea for utilising the side lights of the entrance as external doors—not a very practical arrangement, however.

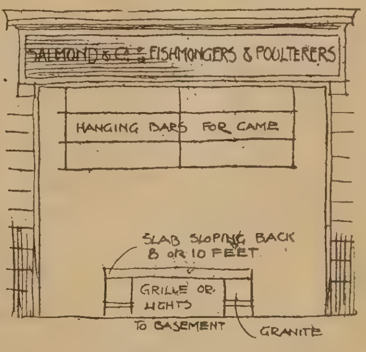
These details are, however, principally applicable to fronts entirely of plate glass, and would not call for consideration in every case, and as I have already mentioned the possibility of bettering existing conditions by giving each particular trade a front to suit its own particular requirement, it remains to be determined how best this can be done.

The above remarks might apply to a front such as would be desired as suitable for a draper, grocer, or others who exhibit wares which might be called imperishable, when compared with those of the butcher, fishmonger, poulterer, and so on. The proper requirements in the latter trades are perhaps given effect to in England more than in Scotland, and the examples I give might be called typical English examples. It is possibly a misnomer to speak of butcher's shops as having a front—for they are almost absolutely devoid of such, being for the most part open, except for the bulk consisting of built seats supporting marble slabs for the exposure of the food. An ornamental iron grille occasionally spans the upper part of the front, sometimes replaced



ELEVATION SECTION

TREATMENT OF BUTCHER'S SHOP.


SALMOND & Co. FISHMONGERS & POULTERERS
HANGING BARS FOR GAME
SLAB SLOPING BACK 8 OR 10 FEET
GRILLE OR LIGHTS
TO BASEMENT
GRANITE

ELEVATION

TREATMENT OF FISHMONGER'S SHOP.

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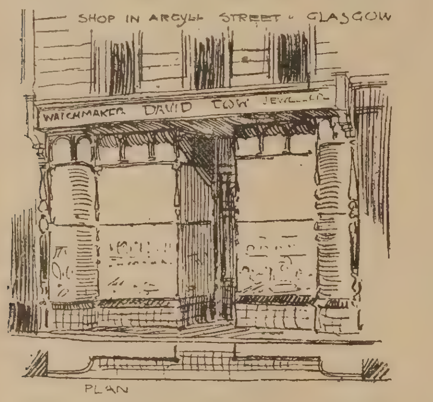
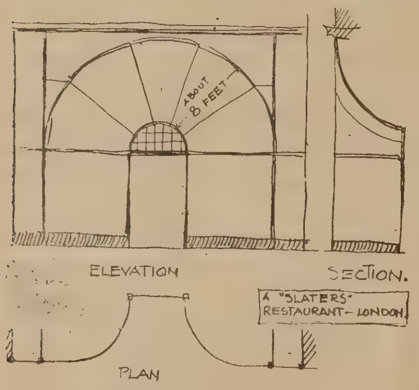
* A paper read before the Glasgow Architectural Association on February 7th, 1899.

by a glazed screen from a height of 8ft. or 9ft., while protection is afforded by a curtain, which revolves round a drum behind the signboard.

Considerable similarity exists between these and the front of fishmongers' or poulterers' premises, which likewise possess the bulk supporting, in this case, a seat extending back some 8ft. or 10ft., while, overhead, hanging bars for game take the place of the iron grille. That these are capable of some distinguishing and artistic treatment will hardly be questioned, and even in Glasgow we have the admirably suitable premises of Messrs. Sawers to make the possibility more universal.

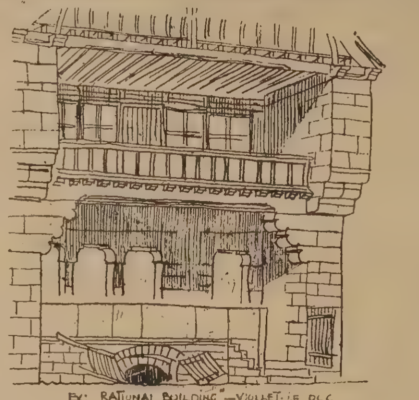
It is, perhaps, far-fetched to term jewellers' wares perishable, but the necessity for some provision in order to guard against theft has accounted, in one instance at least, for rather a unique treatment singularly appropriate to these shops. This consisted of an ordinary plate glass front, with a very light but exquisitely wrought iron grille the full size of the window (inside), except for an oval-shaped opening for unobstructed view; this grille, besides being pretty in itself and a safeguard against theft, served a good business purpose in so far as it caused more people to look in from the idea thus given of the great value of the goods. In Glasgow, the latest examples of jewellers' shops are resplendent in circle corners, turned balusters, and bevelled plate, not at all such an artistic means to an end.


SHOP IN ARGYLL STREET - GLASGOW


A "SLATERS" RESTAURANT – LONDON

The treatment of the ubiquitous public-house, while in many respects not always according to the canons of good taste, has something to recommend it, at least, in the fact that it is as a rule easily recognisable by other means than by occupying with some companion establishments the corners of a street. In large towns, at least, the windows lend themselves to a special treatment. The lower portions, shoulder high, must obviously be treated with material which will stand more abuse than glass—it may be wood, tiles, or metal—while the upper portions for the purpose of affording light *must* be of glass, and, to prevent being overlooked by passengers on tramway cars, *must* be obscured in some manner.

Restaurants may, I think, have much in common with public houses, but some of the latest London places show indications of a special magnificence, prodigal in the use of granite, hammered metal, modelled plaster, and bevelled plate, calculated, I presume, to whet the hungry edge of appetite "by bare imagination of a feast." Slater's well-known places resort to more awe inspiring means by virtue of an American-like composition of curved glass and metal astragals, which certainly have the desired effect of attracting attention.


EX: RATIONAL BUILDING — VIOLLET-LE-DUC

For illustration more than emulation, I need hardly say, an example of this kind of work is here given, and this class of business, requiring as it does less of the plate glass, so far as mere exhibition of wares is concerned, is perhaps more easily treated than the others; and I can refer to no better example than Miss Cranston's new premises in Buchanan Street.

The cases I have quoted, however, are probably sufficient to bear out what I said regarding the possibility of artistic treatment arising out of the exigencies of the particular purpose to which the shop is to be devoted, and in addition to the points of detail referred to may assist in enabling us to make the most of our shop fronts as we are at present compelled to provide them.

Suppose now, in the second place, that clients are more elastic, and willing to forego more in the way of inordinate demands for every available square inch of room, the problem seems to come somewhat nearer solution, assisted, in some measure, by the fact that past experience, or precedent of older examples can then be given effect to. Before examining these, and merely asking from the client permission to build butts at intervals, and a possible further concession at the corner of the building, a great deal may be done in itself towards assisting not only the commercial value but the architectural expression. For instance, supposing there is a butt of reasonable width between each window—in the case of a long front—the architectural gain is not only patent, but the appearance of the window is enhanced by being thus set in a frame.

Where these divisions are merely astragals of brass, mahogany, or iron, the one window seems to get melted into the other, bewildering the onlooker, while detracting from each separate display. In the other case each window stands by itself, and so being one can better and more contentedly examine the wares, when we have no conflicting element adjoining, much the same as we seem to appreciate a picture better after the exhibition, when it is detached from its surrounding neighbours, excellent though they may be.

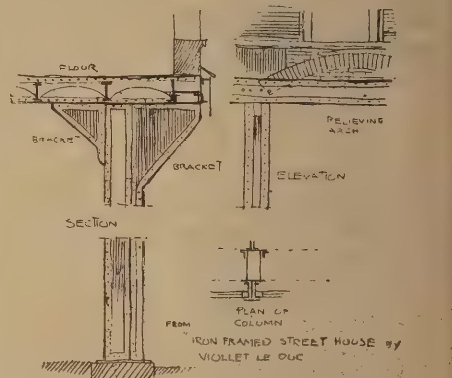
BRICK HOUSE MONTEPULEIANA

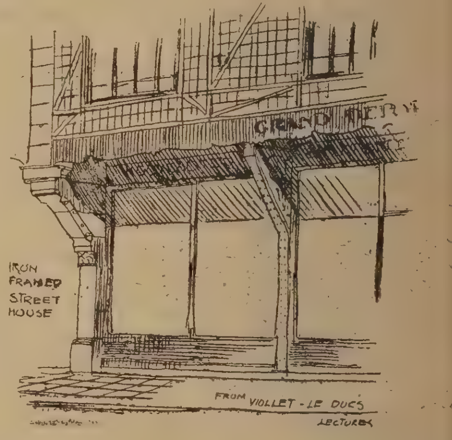
For an example I may quote the case of McGeoch and Kemp's premises, in George's Place, where although the dividing butts are circular columns and much larger than would be necessary, the effect of each window dressing is in itself entirely satisfactory.

When on the subject of doors and following upon the pier question, there is no reason why these should be framed into the windows as it were, instead of forming a separate and better marked position at the side.

In the same connection, and consequent upon the convenience of a circular corner, the temptation to indulge in an arch over the doorway therein cannot be passed without a reflection upon the unsatisfactory effect of such a combination.

It is interesting to note Viollet-le-Duc's suggestions towards a rational solution which he indicates in his lectures. Whether his idea was obtained from some old Italian street fronts or examples in our own country does not matter; all that it contains in common is the salient feature of a projecting upper storey, which he proposed to use at once as a shelter from the weather and a sun shade. Here the supporting element consists of rivetted iron columns, finished flush with the windows, to which iron brackets for the support of the floor and projection over are attached, allowing of appropriate external and internal treatment. The juxtaposition of the window proper and the column is, to my mind, not happy, and in case of failure or repair by way of painting, &c., would be inconvenient and awkward. At the same time a considerable free surface is obtained, and the supporting features are not unduly concealed from view, and do not occupy much space laterally.


FROM IRON FRAMED STREET HOUSE BY VIOLLET LE DUC

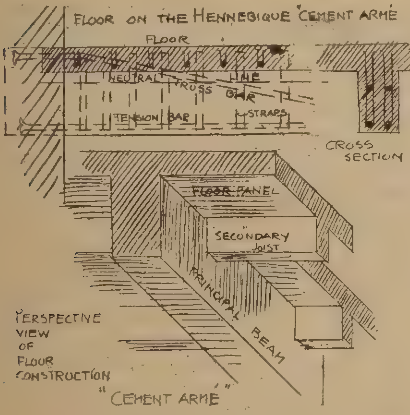

IRON FRAMED STREET HOUSE
FROM VIOLLET-LE-DUC'S LECTURES

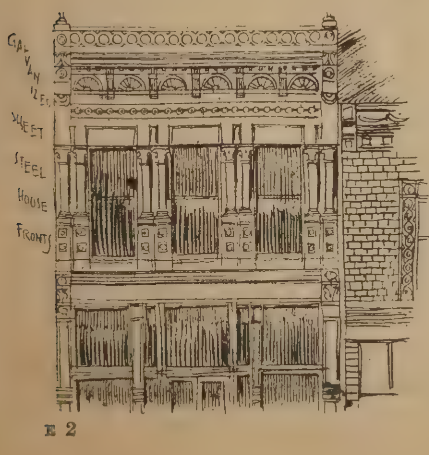
In his "Rational Building," however, he illustrates a mode of construction of house fronts common in Burgundy, consisting of a corbel arrangement supporting a bressummer-like gallery or balcony, recessed within which is the outer wall of the house or shop proper. This might well have been the prototype of the late E. W. Godwin's front to the Fine Art Society, in which the recessed portico forms a salient feature, the constructional functions being admirably expressed by the piers and columns on each side, while the commercial convenience is no less apparent. The same idea has been repeated in some contemporary works, and, it seems to me, offers a possible solution of the problem. The constructive element stands by itself, and the recessing of the shop front proper allows for any danger of subsidence, without endangering its entirety, while enabling it to be cut up and otherwise treated, or even left as one unobstructed space. The recess will hardly be lost space to the proprietor, inasmuch as it provides for the comfort of his patrons, who can thus examine his wares without fear of jostling by the crowd, at the same time being sheltered from the elements.

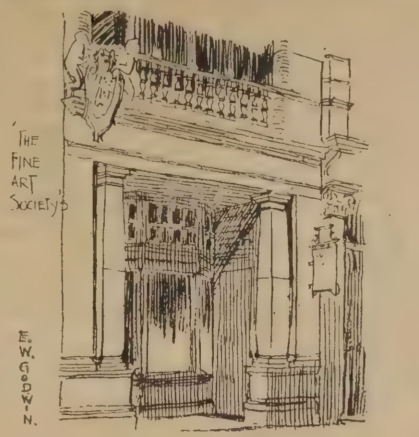
In the case of a long front it only means an extension of the principle to form a colonnade, which, as we have seen, is an old contrivance, for it is in the main similar to the Chester Rows, which arrangement to this day is in every way convenient for shopping, new buildings on like lines having been erected within recent years.

Even to us the idea is not a stranger, because at Greenock, Messrs. Barclay have carried out at the Municipal Buildings there a similar arrangement, appreciated by the public, and, so far as I have ascertained by the shopkeeper; the colonnade itself may either be trabeated or arcuated, the former, for reasons already given, for preference. The lintel difficulty (that is to say, difficult if honest construction is to be observed) may be solved either by a flat arch, exposed iron beams as before, or *concrete*. With regard to the latter, the French "Cement Armè" system seems quite logical, consisting as it does of iron and cement in their proper statical capacities with regard to their resistance to stresses, while, if we must, it certainly conforms to the aforementioned building regulations.

Objection has been taken to the colonnade because it "gave rise to scenes inconsistent with the highest theory of social life;" but collapsible gates and more light would put the veto on this objection. The mention of light recalls a suggestion, and, I think, a good one, which I saw recently, that shopkeepers should keep their premises illuminated until after dark, thus enabling their wares to be inspected by those who cannot do so before closing time, while at the same time adding to the lighting of the thoroughfare and adding to their own prominence, not to mention financial interests, for, as a safeguard against shop breaking, light is invaluable, and more so when assisted by the offices of an intervening colonnade.




GALVANIZED SHEET STEEL HOUSE FRONTS



Of course, iron must always enter more or less into the construction of our shop fronts, but it would not be necessary in this case to adopt it so largely as at present, as it would also enable us to avoid introducing the steel-framed structures which we find in America. These I have avoided referring to, in so far as shops are affected, because a solution of the problem has not yet been accomplished, even there, by this mode of construction, which conceals entirely the supporting elements. There also exists there, however, a system of construction, which exposes in all conscience these elements, inasmuch as it consists entirely of steel; but it does not on that account by any means produce a more satisfactory result, and I crave your indulgence while I quote from an advertisement in an American paper, which accompanied the illustration here reproduced. It represents a galvanised sheet steel shop and house front—net price at New York, £41—then to quote, "this price includes 20ft. cast iron sill, course 8in. wide, combination wood and steel columns, all the galvanised iron work of second storey, bottom of lintel course to top of main cornice and pediment, all shop windows, doors, transoms, and transom bars, window frames, all glass double strength" (for support, I presume). "We make and ship 800 fronts annually, 10ft. to 300ft. wide, one to five stories high. They are now the best, cheapest, and most elaborate in the market. Any ordinary mechanic can put up our fronts, owing to their simple construction, and aided by a set of instructions sent with every shipment. We desire to introduce this class of work into every city and town in the United States, and, therefore, solicit the correspondence of architects, builders, and parties contemplating building. Catalogues on application."

I have not alluded to shop fronts which embrace two floors or storeys. In cases where the upper floor is not necessarily required to be as entirely free from obstruction, and where an arch can be introduced which takes the superincumbent weight, many of the difficulties of support do not present themselves, other than the accurate proportioning of the abutments, to which, in lieu of the increased window space over, the client should not seriously object. I have merely attempted to embrace, so far as they presented themselves to me, the difficulties involved in a one-storey shop front—the class of thing which most frequently comes under the architect's notice; and, in leaving the subject here for your further consideration, I feel sure that many points of difficulty, and many aspects in which the subject has presented itself to others, must have been omitted, which omissions have been inadvertent on my part, and only serve to prove the existence of many intricacies in one of the most absorbing problems of our modern architecture.

Members of the Belfast Mechanical Engineering Association recently visited Loop Bridge Works, which belong to Messrs. M'Caw, Stevenson, and Orr, Limited.

Correspondence.

"DELPH" STONE.

To the Editor of The Builders' Journal.

Liverpool.

Dear Sir,—The "Delph" stone T. H. S. asks about (see p. 8 of last week's issue) is apparently nothing more than *quarried* stone, a quarry in the dialect of the West Riding of Yorkshire being known as a *delph*.—Yours truly, R. W. G.

SOUND-PROOFING ARRANGEMENT.

To the Editor of The Builders' Journal.

London, N.W.

Sir, — With reference to the enquiry addressed to you by "North London," and published in last week's issue, I should certainly advise your correspondent to obtain samples of Patent Combined Silicate Cotton and Plaster Slabs from Jones and Co., Perrin Street, Kentish Town, and if he finds that particular form of silicate cotton not suitable for his present requirement, doubtless they could supply the material in a form which would meet his requirement.

Unless concrete be used at a much greater thickness than mentioned by your correspondent, I cannot see how such a solid body could act as a non-conductor of sound, as it is quite contrary to the laws of sound. Silicate cotton is undoubtedly the finest hair-harbouring body in existence, and it has the extra advantages of being absolutely incombustible and sanitary, and of being applied in a dry state.—Yours truly, C. CHRISTIE.

A SUGGESTION.

To the Editor of The Builders' Journal.

Dear Sir,—May I venture to make a suggestion with regard to the Builders' Journal, which I hope will meet with your approval. This is, at the end of every five years to publish a complete table of contents or index up to date. I have taken in your paper since the commencement, which, if I am not mistaken, was five years ago next February, and have found it most useful for reference, but have felt very much the want of a combined index. Hoping that by the end of the next half year you will see your way to do this, always continuing the index to each volume.—Yours truly, V. H.

[Such an index as V. H. suggests would involve considerable labour and expense, which would not be justified unless there were a fairly large demand for a publication of the kind. If we had reason to suppose that it would meet a widely felt want, we should be pleased to undertake its preparation. We should, therefore, be glad if any readers to whom an index to the first ten volumes would be likely to prove valuable would communicate with us.—Ed. B.J.]

Fire at a Joiners' Workshop.—A disastrous fire occurred at the workshop of Messrs. Chinie and Son, joiners, of South Shields, last Thursday. All the workmen escaped with the exception of one apprentice, named Elliot, aged sixteen years, whose body was subsequently discovered burned to a cinder. Another apprentice was badly injured.

"The Property Gazetteer" is a new monthly publication, intended to afford a medium by which the public may be made aware of the estates, houses, and properties of all kinds for sale or to let throughout the United Kingdom. The first issue contains 203 pages, each occupied by one city, town, or district. A descriptive heading of each place includes distance from London, trains and fares, and climatic, sanitary, scholastic and historical information. The remainder of the page deals with the local property market, giving a good selection of properties for disposal, houses—furnished and unfurnished—to let, &c. The plan on which the information is set forth is both novel and convenient. A monthly circulation of 10,000 copies is guaranteed. The price is one shilling, and the book is published at 144, Fleet Street, E.C.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

BOOK ON QUANTITY SURVEYING.

To the Editor of The Builders' Journal.

Skipton.

Dear Sir,—Will you kindly inform me, through your valuable journal, what book on quantity surveying you would recommend for a beginner?—Yours, &c., H. E. M. H.

"Quantities," by Prof. Banister Fletcher (price 6s.), B. T. Batsford, 94, High Holborn, W.C., is the book that will best suit your purpose.

FIXING STOVE TILES.

To the Editor of The Builders' Journal.

Scarborough.

Sir,—Would any reader kindly tell me what material to use for fixing tiles to slabs of stone or cement, such slabs to be fixed at the sides of interior stoves. I find when fixed either with cement or plaster the heat of the fire generally forces them off.—Yours, &c.,

T. R.

When stove tiles are not set in a frame they are usually set in cement or plaster, but Roman cement is credited with standing heat better than Portland cement, and might be tried.—Henry Adams.

PROJECTION OF SHADOWS.

To the Editor of The Builders' Journal.

Wandsworth, S.W.

Sir,—I should be obliged if you could inform me if there is any publication in existence treating of the projection of shadows in geometrical elevation and in perspective.—Yours faithfully, LIGHT AND SHADE.

The books that will probably best suit your purpose are the following:—"Sciography, or Parallel and Radial Projection of Shadows," by R. Pratt, price 7s. 6d.; and "Text-Book on Shades and Shadows, and Perspective," by John E. Hill, price 8s. 6d. net. Both these books can be obtained from Mr. B. T. Batsford, 94, High Holborn, London.

SURVEYING PRACTICE IN FRANCE.

To the Editor of The Builders' Journal.

London, N.

Sir,—Will you be kind enough to tell me where I could get any information as to the methods adopted by quantity surveyors in France, or in what way they differ from the general practice in this country? Also if there is any institution in France corresponding to the Surveyors' Institution here?—Yours faithfully, C. D.

There is no institution in France corresponding to that of the Surveyors' in London. The surveyors in France are called "vérificateurs"; they are more or less architects who manage houses and estates, value goods, and check all kinds of executed work following contracts. Each Government department has its own "vérificateur," and the Law Courts select such as they may require as experts from among the architects who discharge that duty. E. C.

"CYPHUS" TREES.

To the Editor of The Builders' Journal.

Haslingden.

Dear Sir,—I have an enquiry respecting cutting down trees in Lancashire about 150 years ago. In an old account it states: To falling (a given quantity) of English oak trees, then comes a given quantity of Cyphus, and the next a given quantity of Owlers and other trees the names of which I know, but what I want to know is what are the "Cyphus" to be cut down. There is a place about two and a half miles from here called Owler Bottom, and an old account shows that 700 Owler trees were cut down at one time there. QUERIST.

We are of opinion that the trees referred to are Cypress trees, though we cannot find the spelling "Cyphus" in any work on etymology. The forms "Cypur" and "Cypyr" occur frequently in old documents, and the Latin word being "Cupressus," it seems quite logical that an arboriculturist with a knowledge of the scientific names of plants, &c., would designedly, or by accident, spell it "Cyphus."—G. A. T. M.

BOOKS FOR SOCIETY OF ARCHITECTS EXAM.

To the Editor of The Builders' Journal.

Appleby.

Dear Sir,—As a reader of your valuable paper, can you give me a list of books that would be sufficient for the exam. of the Society of Architects, those that may be looked on as really necessary, leaving those merely required for occasional reference out of account.

I have the list of recommended books, but it is difficult to choose without advice.

CRAIG DOUGLAS.

The books necessary for the Society of Architects' exam. are:—History, Russell Sturgess "European Architecture" (or other approved work), supplemented by Fletcher's "Comparative History"; Construction and Materials, Rivington's or Mitchell's "Building Construction"; Sanitation, Coleman's "Sanitary House Drainage"; Stresses, Middleton's "Stresses and Thrusts"; Quantities, either Fletcher's or Leaning's book. The series of "Model Answers" of which the first instalment appears in our columns this week will, no doubt, prove specially useful.

Keystones.

Darfields Sewage Scheme.—The Local Government Board have requested that 600 yards of metal piping be laid instead of earthenware, and that the tanks be built much stronger than was specified in connection with the new sewage scheme for Darfield. The first estimate of the cost was £7,000, but the alterations made by the Local Government Board will add £2,000 to this.

The Sanitary Inspectors' Examination Board.—The first examination for certificates of qualification for appointment as sanitary inspector, under Section 108 (2) (d) of the Public Health (London) Act, 1891, will be held in London on Tuesday, December 5th, 1899, and the four following days. Particulars will be forwarded on application to the hon. secretary, Mr. W. R. E. Coles, 1, Adelaide Buildings, London Bridge, London, E.C.

Improvements at Yardley.—Mr. Sandford Fawcett, Local Government Board inspector, attended Sparkhill Institute recently, for the purpose of inquiring into the application made by the Yardley District Council for sanction to borrow the sums of £7,980, £2,365, £495, and £180, for the provision of public offices, depôt, fire station, and mortuary respectively, to be situated between Stratford Road and Little Showell Green Lane. Mr. F. L. Thompson gave evidence on behalf of the Council, and the consideration of the application was postponed, to enable the architect to submit detailed estimates.

The Ossett Sewerage Scheme.—An inquiry was held at the Temperance Hall, Ossett, last week, by Colonel A. G. Durnford, R.E., an inspector of the Local Government Board, regarding the proposal of the Ossett Corporation to borrow £5,000 for sewerage purposes. The scheme was explained by the Corporation's engineer, Mr. Sam Shaw, and is designed to deal with the sewage of certain outlying and recently developed portions of the borough, which were not fully provided for by the general drainage system carried out under the provisions of a special Act of Parliament obtained in the year 1875. The scheme was not opposed.

The Monument to M. Félix Faure is to be executed by the sculptor René de Saint Marceaux. The site of the sepulchre is on the right of the central walk rising to the chapel in the cemetery of Père-Lachaise, Paris. The site is six mètres in superficial area, and is at the side of the tomb of Thomas Couture, and in front of that of Paul Baudry. The monument is to be raised near that to the dead of St. Bartholomew, which will be surrounded by a Greek garden, in this same central walk.

The Widening of Ouseburn Road, Newcastle, was considered at a meeting of the Town Improvement Committee of the Newcastle Corporation last Wednesday, and arrangements were come to with the landlord of what is known as the lower part of Stratford Grove Terrace, for the widening of part of the Ouseburn Road, which is not far from Jesmond Vale, by a give and take line, which will materially widen the road at a given narrow point.

The New Wing of Tiverton Infirmary was opened last Thursday by Sir Stafford Northcote. The new building is called the Victoria Wards, and comprises two wards of two beds each for male and female patients, and in addition a waiting lobby, nurses' room, operating room, bath-room, boiler and heating apparatus for the entire building, with linen, coal, and wood stores, &c. The new wing is uniform with the rest of the building. Messrs. Deering and Son were the contractors, and Mr. J. Siddalls was the hon. architect. The cost was about £1,550.

The New Bishopthorpe Church was recently consecrated by the Archbishop of York. There are a south chapel for weekday services, north and south aisles, sacristy, and organ chamber; on either side the east window are the figures of St. Peter and St. Andrew—patron saints of the Minster and the church. Most of the fittings are of oak, but the side chapel is seated with chairs. The old fifteenth century font and two bells formerly in the now destroyed church of St. Crux, York, have been presented to the new church, which has cost about £5,000. Mr. Hodgson Fowler is the architect.

The New Kesteven Asylum.—A Local Government Board inquiry was held last Tuesday week into an application made by the Kesteven County Council for power to borrow £140,000 towards the cost of the erection of the new county asylum at Rauceby, near Sleaford. It was stated in evidence that it was originally proposed to borrow £120,000, but it had since been found that this would not be sufficient. The tender for the superstructure of the asylum was £106,393, and in addition it was estimated that £7,800 would be required for boilers, etc., £5,000 for electric lighting, £2,000 for farm buildings, £10,000 for furniture and equipment, £2,500 for laying out grounds, £8,000 for architects' and other fees—total of £144,693. Allowing for money already received, £139,730 was the sum likely to be required, and the County Council now asked for power to borrow £140,000. The asylum would accommodate 420 patients. They wished to obtain £50,000 forthwith in anticipation of securing a provisional order early next session.

Street Improvement and New Fire Station at Blackpool.—Last Wednesday Col. W. R. Slacke held a Local Government Board inquiry into the application by the Town Council for power to borrow £13,000 for street improvement purposes and £6,000 for the erection of a new fire-engine station. Mr. T. Loftos (the town clerk) explained that the first loan was needed for what is known locally as the Cow Gap Lane improvement, over which there had been much contention, the land in several cases having to be bought by compulsory purchase. The Corporation proposed laying a road 50ft. wide, and for the work £10,884 was needed, and the remainder of the loan would go to the purchase of land. The fire brigade was to be accommodated in a new building near the police station instead of the old place, which was inadequate, and which was to be removed for proposed street improvements already sanctioned. There was no opposition, and the inspector, having taken evidence, visited the localities.

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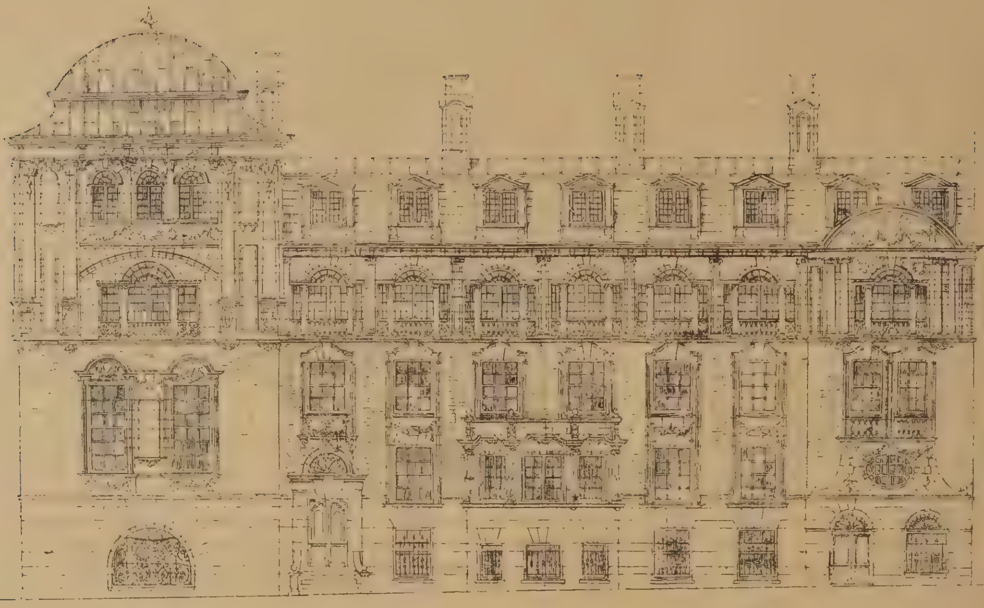
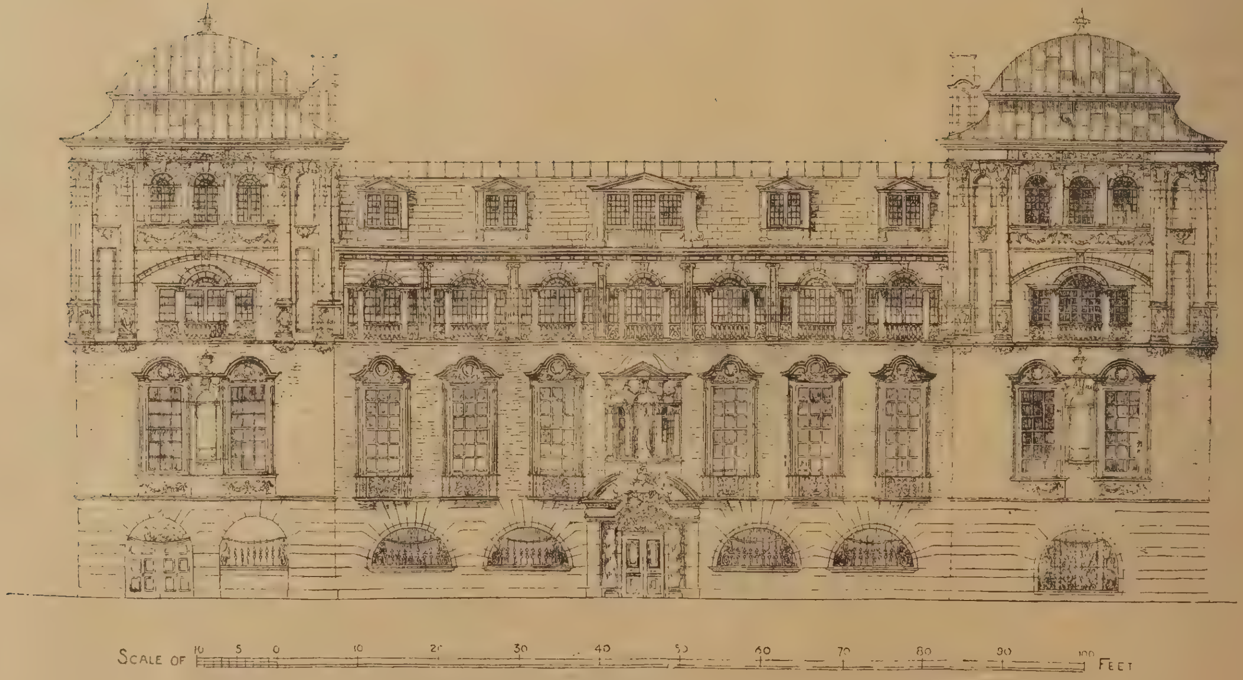


ELEVATION TO EXHIBITION ROAD.



ELEVATION TO IMPERIAL INSTITUTE ROAD.

ROYAL SCHOOL OF ART NEEDLEWORK, SOUTH KENSINGTON. F. B. Wade, F.R.I.B.A., Architect.

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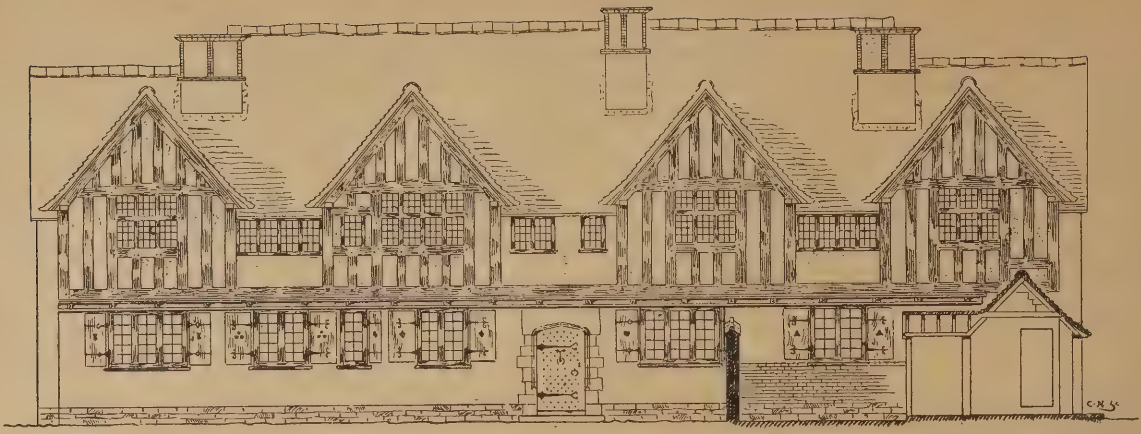
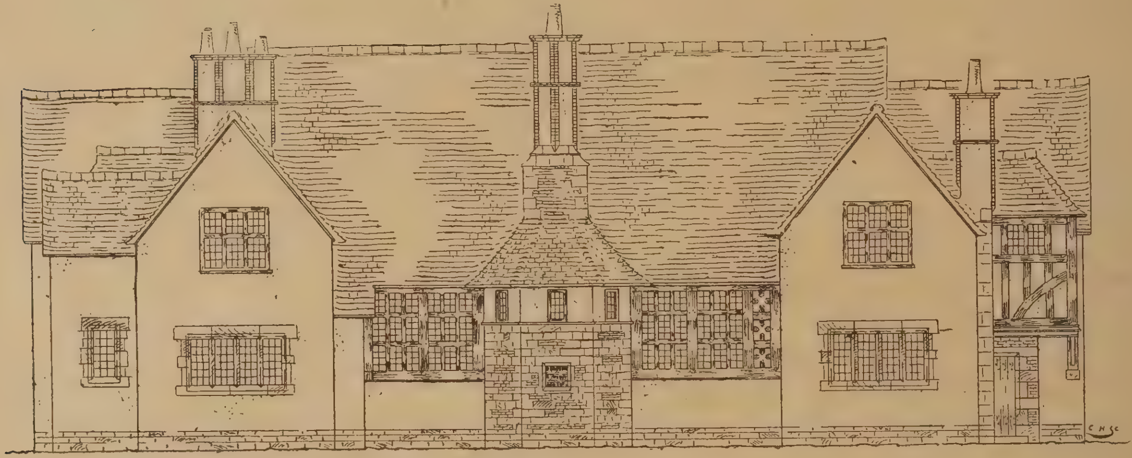
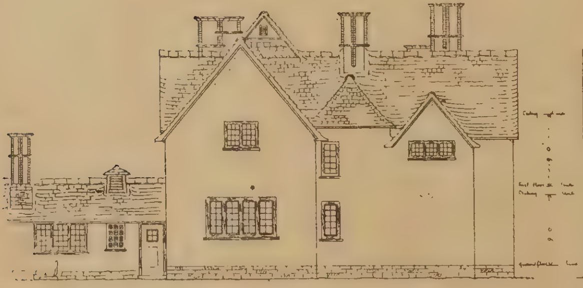


South East



North West



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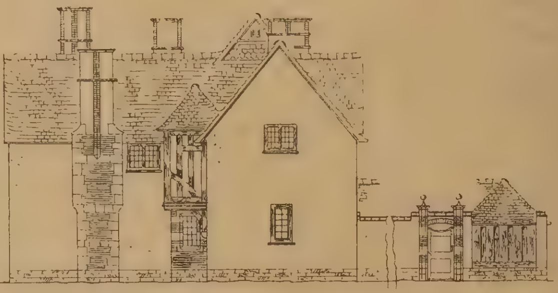

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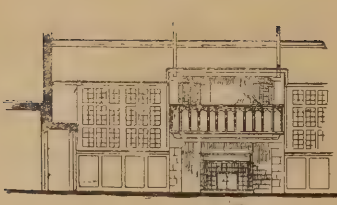
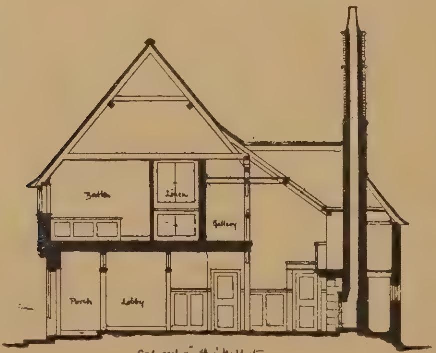
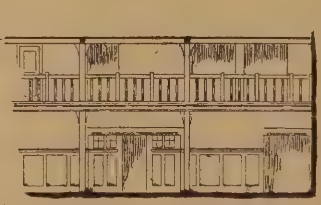


Section thro' Hall, showing fireplace

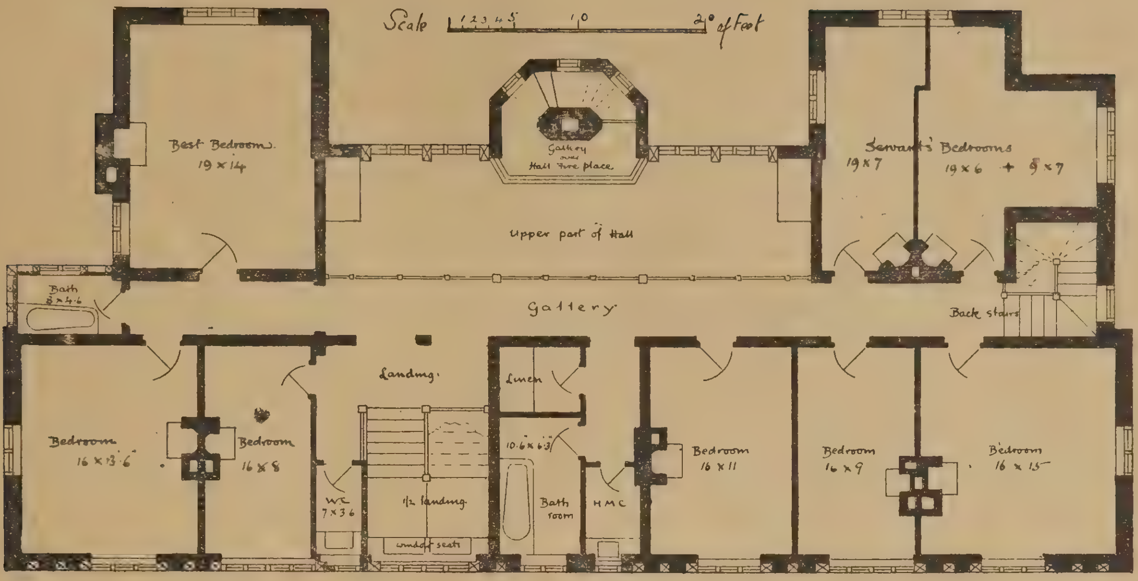


Cross-section thro' Hall etc.

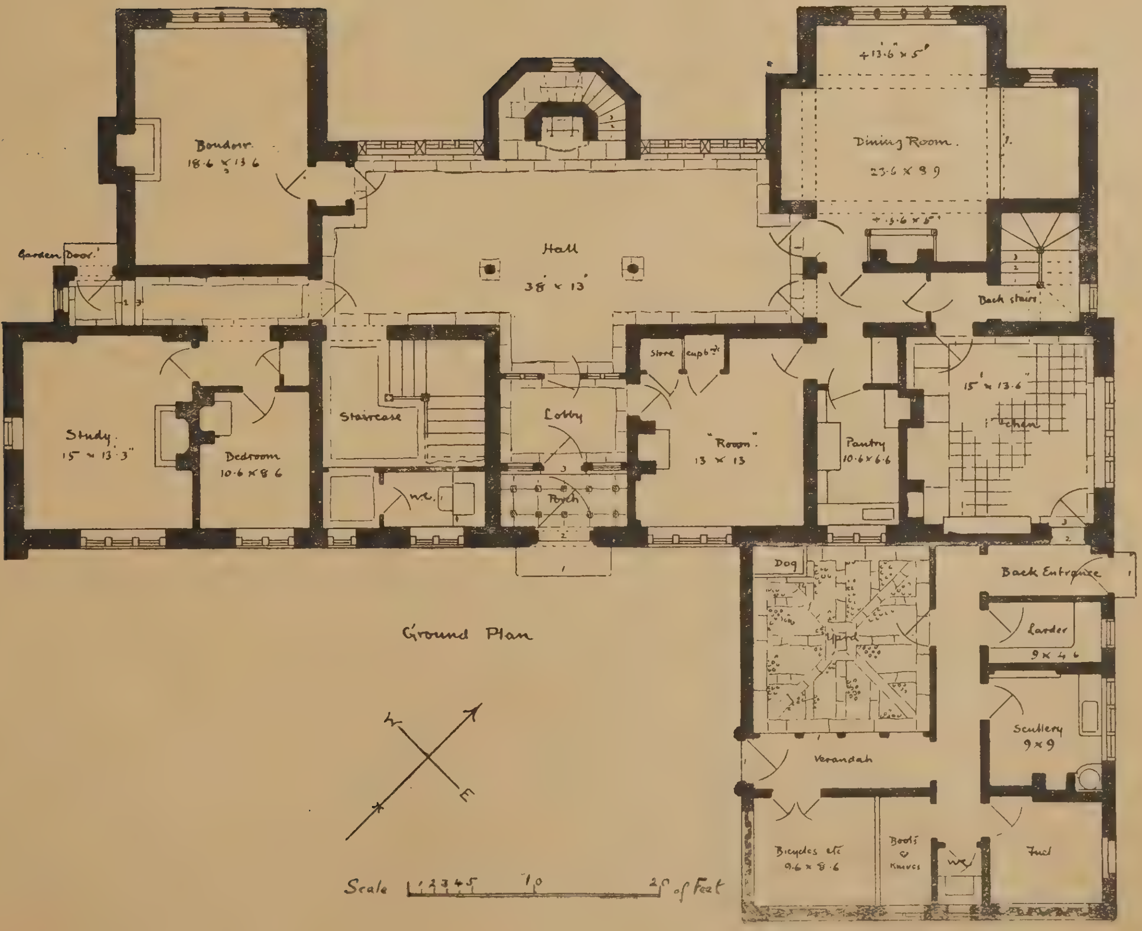


Section thro' Hall, showing Gallery etc.

"BUILDER'S JOURNAL" COMPETITION: HIGHLY COM



Bedroom Plan



Ground Plan

ENDED DESIGN. By Henry Rose—"Martello." (*See* p. 27.)

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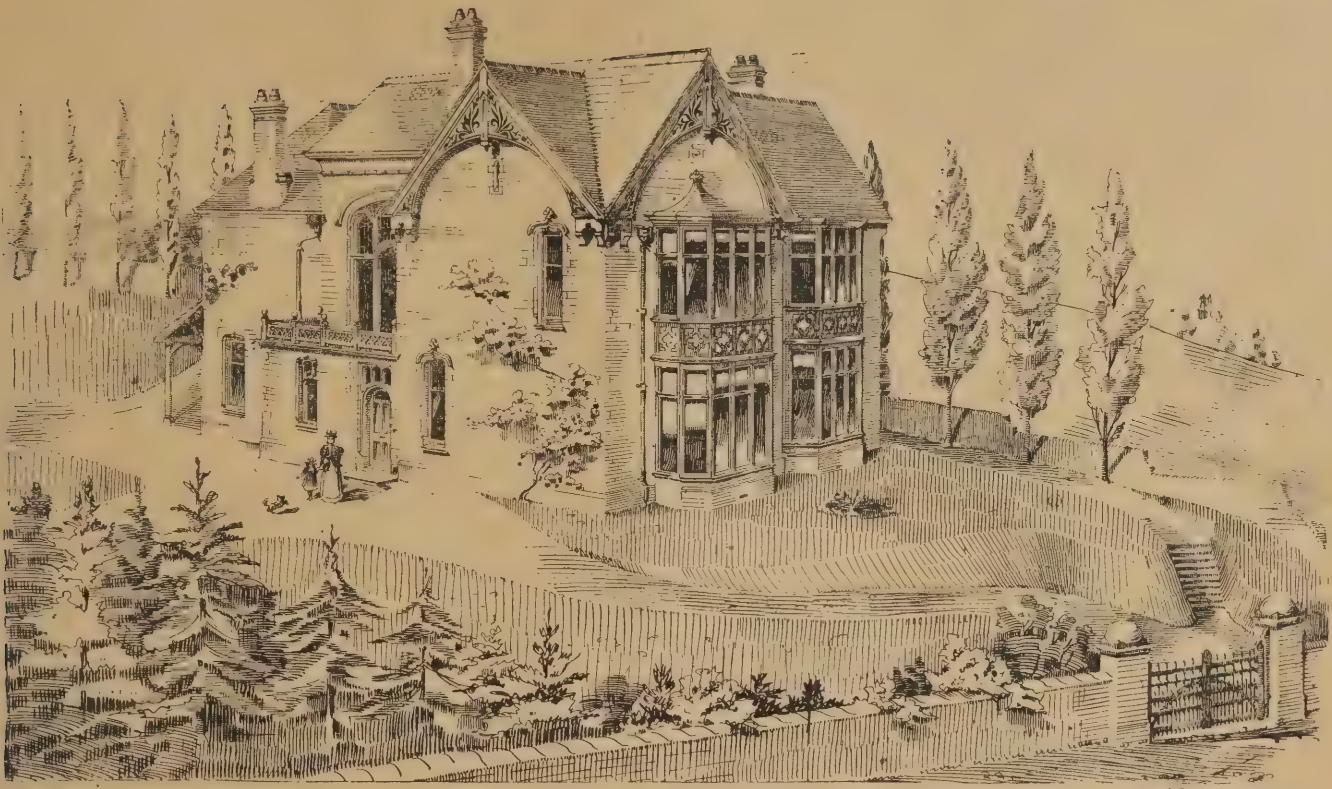
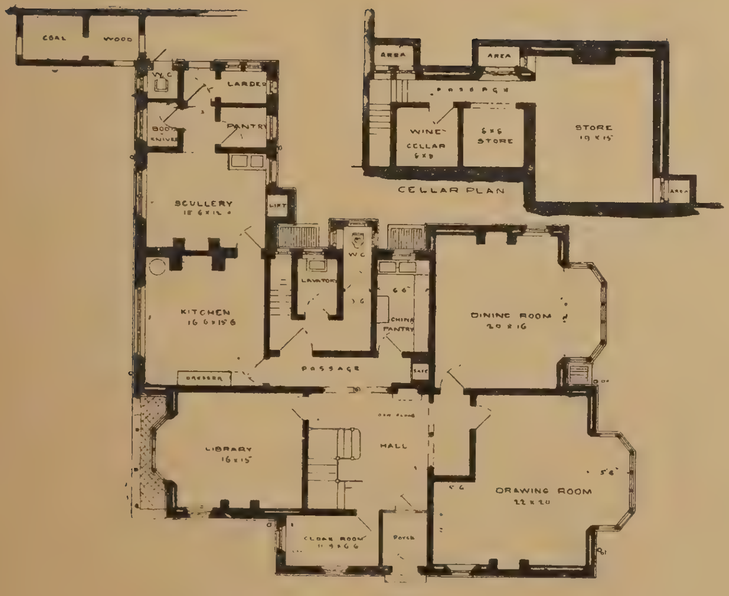
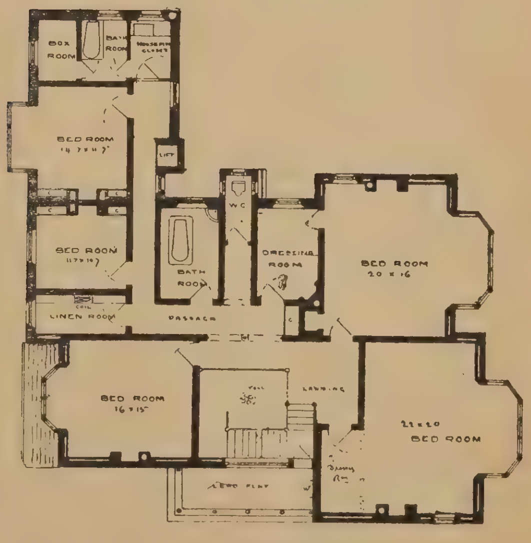


Chas B Fowler FRIBA
Cardiff



GROUND PLAN



FIRST FLOOR PLAN

C B Fowler FRIBA
Cardiff

HOUSE AT LLANDAFF FOR WILLIAM TAYLOR, Esq., M.D., J.P. CHARLES B. FOWLER, F.R.I.B.A., ARCHITECT.

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MODEL ANSWERS TO EXAMINATION QUESTIONS.

Answers to Questions set in the Examination held by the Society of Architects in April, 1899.

By G. A. T. MIDDLETON and R. W. CARDEN, Associates R.I.B.A.

Note.—*It should be understood that the sketches given in this series of papers are purposely only very roughly finished, as the amount of work candidates are expected to do is so utterly out of proportion to the amount of time allowed. At the same time sketches should show sufficient detail to emphasize all the principal points. The sketches are reproduced on a reduced scale; they should, of course, be drawn considerably larger.*

1.—ARCHITECTURAL HISTORY.

(Part I.)

1. *Give illustrated description of the Erechtheion, or of the Choragic Monument of Lysicrates.*

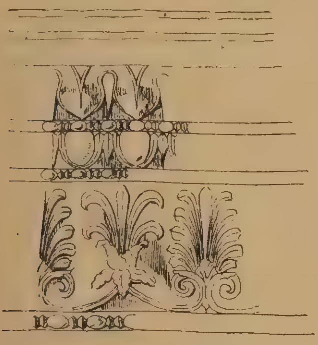
THE Erechtheion, of which the greater part was built in the year 420 B.C., or thereabouts, is of the Ionic order, and consists of:—

(*a*) A main portion, oblong in shape, with a hexastyle portico at one end and façade of half columns in tetrastyle in antis at the other.

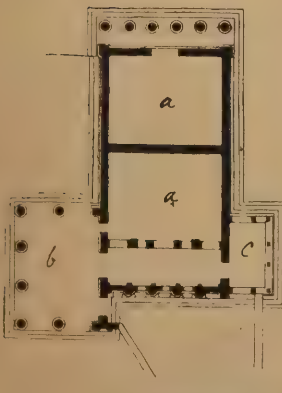
(*b*) To the north of this main portion a beautifully proportioned tetrastyle portico whose capitals, entablature, and enrichments generally, show the height to which Greek art and mechanical skill had attained four centuries before Christ. It should be noticed that the capitals have the unusual feature of a necking of anthemion ornament.

(*c*) To the south of the main portion another portico of the Ionic order, but with the entablature resting upon the heads of beautifully modelled caryatides.

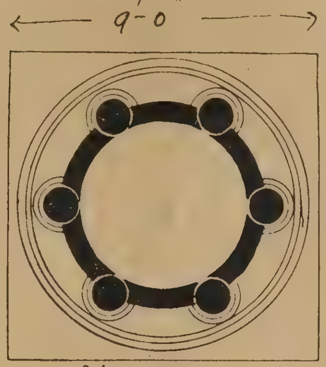
Taken as a whole, the Erechtheion is distinct from any type of building in Greece. Its three parts, as mentioned above, are treated as perfectly independent buildings placed in contact by accident, but there is a main guiding spirit above all their differences which keeps the group in perfect harmony.



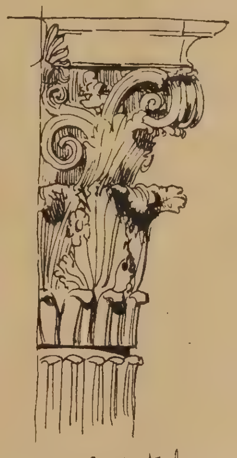
Enrichment from the Erechtheum



PLAN OF THE ERECHTHEION.



Plan Choragic Mon of Lysicrates



Half Capital Choragic Mon of Lysicrates

The enrichments are profuse and elaborate, yet perfectly refined and kept well within their proper limits.

The Choragic Monument of Lysicrates is one of the few instances in which the Greeks employed the Corinthian Order. It was erected in the year 335 B.C., and consists of a plain ashlar base, square on plan, 9ft. wide each side and 14ft. high. This is crowned by a simple moulding. From this platform rises a small circular structure with what appear to be six half columns. They are, however, actual columns as will be seen from the plan.

The spaces between the columns are filled with masonry, so that the columns appear, as above stated, to be only semi-circular pilasters. Upon these is carried the entablature as in purely columnar buildings. The roof is to a flat pitch, slightly curved in outline and surmounted by an elaborate finial of acanthus leaves, treated less conventionally than was usual among the Greeks. As is implied by its name, this was a monument and not a building properly so-called, and this would probably account for the almost "jeweller"-like refinement of its parts. Its total height was only about 35ft.

2. *Compare with sketches the following arches: Titus, Constantine and Septimus Severus; also give dates of each.*

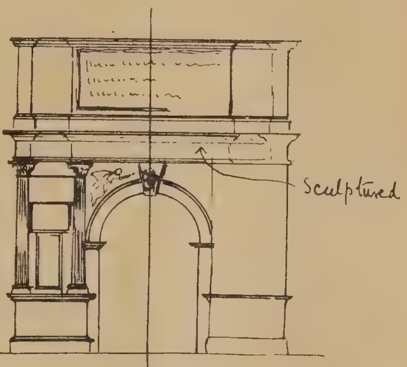
The arch of Titus was built by the Emperor of that name in 81 A.D. to commemorate the conquest of Jerusalem. It consists of one arch only, flanked by pairs of columns standing on a raised base, and with panelled wall spaces between each pair of columns. The order (composite) is crowned by an attic which is considered by modern writers as being slightly too heavy.

The arch of Constantine was erected about the year 330 A.D. It consists of three arches, a larger central one and smaller side arches. As in the arch of Titus, the columns rest upon raised bases or plinths, the mouldings of which are for the most part recessed and returned round the openings. The arches are well separated and delimited by four columns to either face, which carry, or profess to carry, the entablature. The whole is crowned by an attic divided into the three corresponding compartments by pilasters above the columns, the centre compartment containing the inscription, the side compartments each two carved panels, and the pilasters masked by small figures.

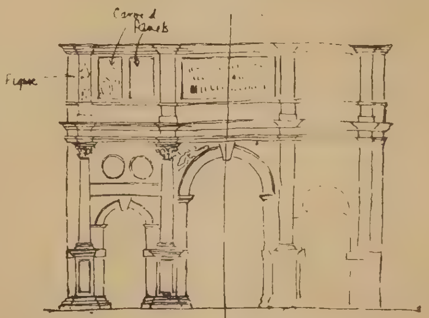
The Arch of Septimus Severus was erected in A.D. 194. In general form and proportion it is much like the Arch of Constantine. Like the above, it has three arches "framed" between columns. In this example the attic is not divided into compartments, but the whole available space is occupied by the inscription. The spandrils of the arches, and in the lesser openings, the panels between the spandrils and the entablature are filled with carving.

3. *Describe briefly the Cathedral and Baptistery of Pisa, giving dates and sketches to illustrate your reply.*

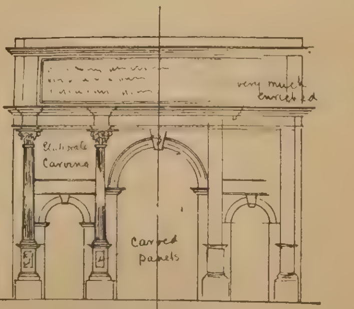
The Cathedral of Pisa was commenced in the year 1063, and is naturally in that style which is so difficult to name, but perhaps is most correctly called Lombardo-Romanesque. Its architect is supposed to have been a man



Arch of Titus



Arch of Constantine



Arch of Septimus Severus

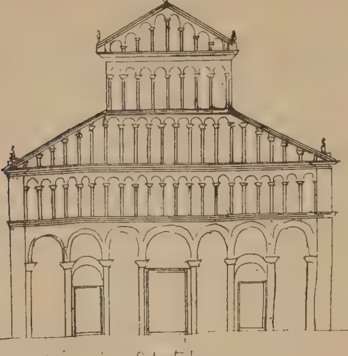
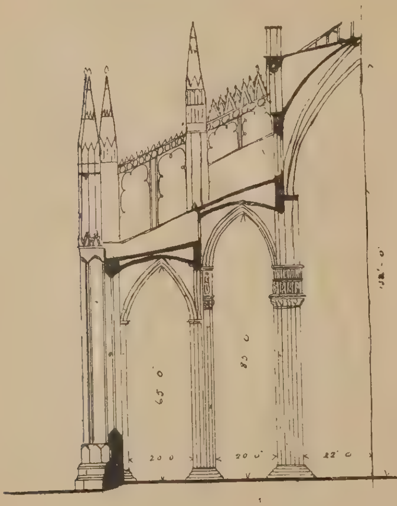


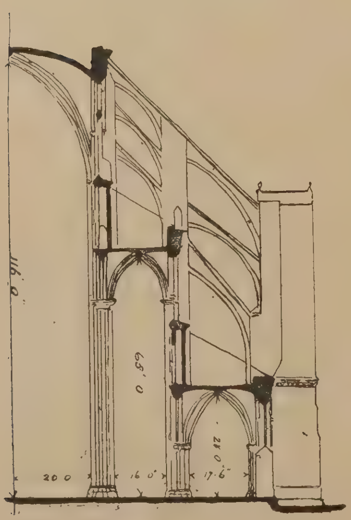
Diagram Sketch
Pisa Cathedral

named Buschetto, but this is not proven. In plan it is cruciform with small apses at the east and transept ends. The crossing is spanned by a pointed dome, of which the lantern recalls those of St. Mark's, Venice. There is a suggestion of the basilica form in the nave and in the proportions of the nave arcading with its columns and round arches. Not more than half the columns, capitals, &c., of this building were sculptured purposely for the cathedral; the remainder were the spoils of the Pisani, obtained from Palermo, Majorca, &c.

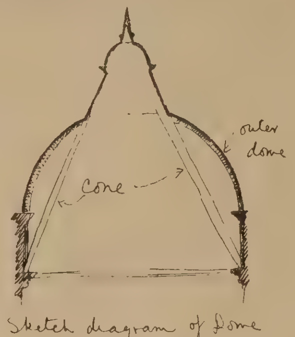
The façade of Pisa Cathedral may be described as the highest point of extravagance to which this particular style attained. The only internal feature marked externally is the line of nave and transept roofs. Beyond this, all is given up to arcading. The lowest stage consists of a wall of arcading of seven arches, three of which are pierced as doorways, the centre one flanked by antique Greek columns. Above this rise four tiers of the usual Lombardo-Romanesque arcades, built for the most part also of the spoils of other cities. Of these arcades, the lowest reaches from above the ground arcade to the eaves of the aisle roofs; the second occupies the height of the aisle roof, the end arcades accommodating themselves to the slope; the third occupies the space between the top of the aisle roofs and the bottom of the nave roof; and the fourth fills the gable end, the arches being shortened as in the second tier. The treatment of the ground stage and first and third tiers of arches is repeated round the sides of the Duomo, the second and fourth tiers being, of course, roof.



MILAN.



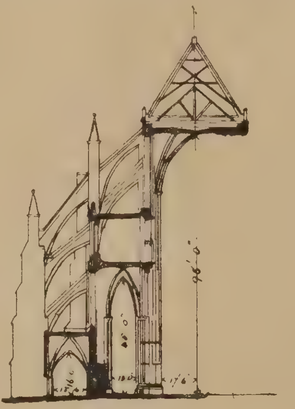
Bourges



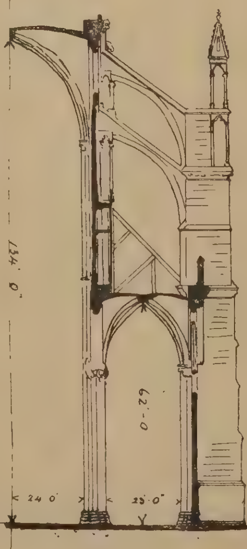
Sketch diagram of Dome over the Baptistery at Pisa

The figures at the angles of the roof are worthy of mention as being probably the first use of figure sculpture in a region in which hitherto the introduction of living figures had not been allowed.

The baptistery at Pisa was commenced about a century later, namely in 1152, the architect's name being Diotisalvi, or Dio-te-salvi. It is a circle on plan, differing in this respect from the usual form of these buildings, which was in nearly every other instance octagonal.



Westminster.



Amiens

Externally it consists of a wall arcade of twenty columns on the ground stage, most of the columns being spoil from other cities as in the Duomo. The principal doorway has antique Greek columns, also similar to the Duomo. The three other doors have spiral columns of Greek marble. Above this arcade is a second of fifty-eight arches coupled (evidently at a later date), and each pair surmounted by a Gothic crocketted pediment, foiled and cusped elaborately. Each pediment is divided from the next by crocketted and canopied pinnacles. The third stage consists of eighteen pilasters and twenty windows crowned with somewhat similar but less elaborate Gothic pediments and pinnacles.

Internally the ground arcade consists of twelve antique Corinthian columns and four pilasters, supporting a similar but far lighter arcade above. The diameter is 129ft., and the span of the dome is 60ft. This dome owes its peculiar shape to the expedient which was resorted to to render it stable; namely, an internal cone, of which the apex protrudes through the summit of the external hemispherical dome.

4. *Give comparative sections of Westminster Abbey, Milan, Bourges, and Amiens Cathedrals, to show the arrangement of aisles, roofs, buttresses, clerestory, and triforium.*

(*To be continued.*)

New Companies.

The Auchencarroch Quarry Co., Ltd.

This company was registered with a capital of £3,000 in £10 shares, to acquire and develop quarries and brickworks or brickfields.

Exeter Brick and Tile Company, Ltd.

This company was registered on July 31, by Taylor and Co., 12, Norfolk Street, W.C., with a capital of £10,000 in £5 shares, to carry on the business of brick and tile makers, builders' merchants, &c. The directors are to number not less than three, nor more than seven. Qualification, 50 shares. Remuneration as the company may decide.

Electrical Transmission Co., Limited.

This company was registered on August 1st, by Sanderson and Co., 46, Queen Victoria Street, E.C., with a capital of £30,000 in £5 shares, to acquire the business carried on at Hammersmith as the Electrical Power Transmission Company, to adopt an agreement with Messrs. Powell, Jones, and Co., and to carry on the business of electricians and mechanical engineers, &c. Messrs. Powell, Jones, and Co. are to be the first managing agents. Remuneration as fixed by the company.

Sturbridge Brick Company, Limited.

This company was registered on August 1st by Waterlow Brothers and Layton, Limited, Birchin Lane, E.C., with a capital of £20,000 in £1 shares, to adopt an agreement with Mr. C. Hobson for the acquisition of a freehold brickfield near Newmarket Road, Cambridge, and to carry on the business of brick and tile merchants, &c. The first directors (to number not less than three nor more than seven) are to be appointed by the subscribers. Qualification, £100. Remuneration as fixed by the company.

Waverley Court Estates, Limited.

This company was registered on August 1st by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £10,000 in £1 shares, to acquire the Waverley Court Estate, at Camberley, Surrey, to adopt an agreement with Mr. A. W. Hughes, and to carry on the business of builders, contractors, &c. The first directors (to number eight) are Messrs. T. J. Hankinson, F. H. Hankinson, W. Overbury, G. J. Lawson, W. T. Reynolds, E. Bath, T. J. Penton, and C. Steward. Remuneration as fixed by the company. Registered office: Richmond Chambers, Bournemouth.

Bricks and Mortar.

"It is not given to everyone to be a genius, but all can be good workmen. The fine artist, doubtless, is he who, as Midas turned everything he touched into gold, cannot make a study or design without giving it some character of beauty; but it is, alas! given to but few of us instinctively to beautify everything we touch. But the qualities of good workmanship are such as can be attained by anyone who has the true spirit of love for his art; and nothing will ever make me believe . . . that it is necessary to work down to the level of the taste of the age."—SIR E. J. POYNTER.

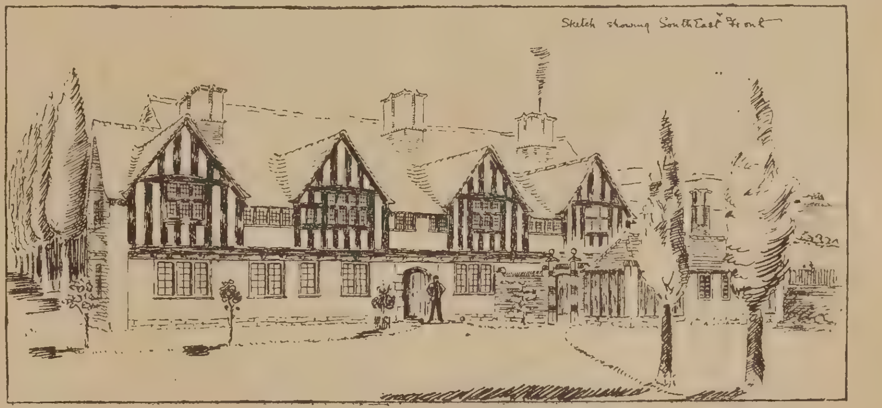
The Queen's Gift to the Nation. WE commented recently on the curious and instructive correspondence that passed between the Treasury officials and the trustees of the National Portrait Gallery with regard to the proposed purchase of three pictures, one of which was a portrait of the Queen by Sir David Wilkie. The sequel is not less curious. As the Treasury would not sanction the expenditure of anything beyond the absurdly small sum annually granted to the trustees of the Portrait Gallery, the pictures in question had to be left for more wealthy or more spirited collectors. Nevertheless, the gallery is no longer to remain without a suitable portrait of the Queen. Her Majesty herself has come to the rescue, and presented to the Gallery the portrait of herself in her coronation robes, painted by Sir George Hayter. This portrait is now at Kensington Palace, but it will shortly be handed over to the trustees.

Discoveries at Tunis. THE report of the Commission of Antiquities and Fine Arts concerning the discoveries made in Tunis during the past few months has just been published, and is very interesting. The most important find was made at Carthage, where three colossal Græco-Roman statues were unearthed. One represents Isis veiled and wearing a diadem ornamented with the upturned crescent; the others, which are somewhat smaller, are of two women, apparently priestesses, with head-dresses as worn during the first century. A very fine statue of Bacchus, giving drink to his panther, was found in another part of Carthage. At El Alia research has led to the discovery in a Roman villa of a large pavilion with two square turrets, joined by a gallery opening to the sea in front by a series of small rooms, which are paved with mosaics. The more important of these mosaics, those of the turrets, represent a Nile landscape, and a local landscape showing fishermen drawing a net full of fish from the sea. Excavations at Dougga have resulted in the finding of an admirable though colossal head of Lucius Verus in white marble. A Christian basilica, built on the ruins of a temple of Saturn, has been found at Thala, and at Teboursouk a triumphal arch let in a Byzantine citadel, of which nothing hitherto has been known, has been brought to light. In addition to these, numerous discoveries of sculptures in bronze and marble, among them a superb sarcophagus with bas-reliefs showing the three Muses, have been made.

Somerset Archæological Society. NEARLY forty members of the Axbridge branch of this society had an excursion to Bridgewater, on July 29th. Bawdrip Church was first visited. This church is a small cruciform structure with a central tower. Puritan church was next visited. It is dedicated to St. Michael, and is a Gothic edifice, 80ft. long and 26ft. wide, with a low spire. It has a thirteenth century screen, and a peculiar staircase in the porch, presumably leading to a former priest's chamber. A drive through Dunball brought the party to the ancient borough of Bridgewater. Here, at the invitation of Mr. and Mrs. Jackson Barstow, tea was partaken of at the Railway Hotel. A visit was subsequently paid to the parish church of Bridgewater, where the many interesting features were pointed out by the vicar (Rev. H. Bircham) and Mr. A. B. Cottam. An inspection of the house where Admiral Blake was born brought to a close a very pleasant excursion.

The Diamond Jubilee Medal. THE medal struck by order of the Corporation of London in celebration of Her Majesty's Diamond Jubilee has now been circulated among the members of the Court of Common Council. On the obverse side is a fine bust of Her Majesty, with an inscription in Latin explaining the occasion of the issue. On the reverse is a figure of Britannia seated on a rock, with the British lion at her feet. On the left are attendant female figures representing Industry and Progress. On the right, close to Britannia, stands the City of London, holding in her right hand a cornucopia, and supporting with her left hand a shield bearing the civic arms. Behind are two figures symbolical of Commerce and the Colonies. The legend above the group runs as follows:—"'From my heart I thank my beloved people. May God bless them.' V.R.I. 1837-1897." The medal has been struck from designs by Messrs. Spink and Son, of Gracechurch Street, E.C.

Design for a Country House. WE publish this week another of the designs which have been "highly commended" by the assessor in our recent competition. The elevations and plans will be found in one of our centre plates. The design is by Mr. Henry Rose, of 3, Staple Inn, Holborn, and was submitted under the motto "Martello."


Sketch showing South East Front

"BUILDER'S JOURNAL" COMPETITION: HIGHLY COMMENDED DESIGN. BY HENRY ROSE.

The following descriptive note accompanied the drawings:—"The conditions as published in the BUILDERS' JOURNAL have been followed as far as possible, and special attention has been given to economy of space in the plans. The private bathroom has been so placed as to provide a flush for the whole drainage system. One of the bedrooms is on the ground floor. A loft for boxes would be provided, approached through a trapdoor over passage to H.M.C., &c., by means of a step-ladder hinged at the top. If attics are required, they could be approached by continuing the back staircase upward. The materials used would be brick and stone, roughly plastered and distempered white where indicated on elevations. Where half-timber construction is used, a hollow space would be provided between it and the inner wall. The roofs would be covered with plain tiles."

The Great Wall of China. THE great wall of China is threatened with demolition. It is stated that an American engineer is on his way to China on behalf of a syndicate of Chicago millionaires, who desire to obtain a share in the expected big contract to be given out by the Chinese Government for the demolition of the wall. The wall is a striking evidence of the immobility of Chinese civilisation, and probably its destruction may be intended to show that now China has made a start in Western civilisation she means to make up for her stationary condition during the past 2,000 years. Erected 200 years before Christ, for the purpose of keeping back the warlike Tartars, the Great Wall of China is older by three centuries and a half than the walls of Hadrian and Antonine in our own country. These latter were insignificant in comparison with the Chinese work, neither of them being nearly 100 miles in length, while the engineering feat of the Emperor Shih Hwangti extends from the shores of the Gulf of Pechili to the remote inland Chia-yu barrier gate, a distance of 1,200 miles. The British walls have almost disappeared, being only traceable here and there by green mounds or shapeless fragments of masonry, except at a few points which owe their preservation to the care of the archæologist. The hand of time, aided sometimes by the hands of the utilitarian builder, who has found some parts of the walls convenient quarries, has slowly but surely removed almost the whole of the work of the Roman engineers. Shih Hwangti did his work in a most substantial manner, for his wall remains to-day in almost perfect condition.

St. Mary-le-Bow Church in Danger. IT is now nearly a year ago since certain ominous cracks were observed in the solid masonry of the church of St. Mary-le-Bow. These openings were naturally ascribed to the burrowings of the Central London Railway under Cheapside. Sir Benjamin Baker has made careful examination. There are five cracks, two of which may be traced on the outer western wall and three in the porch; two of them look alarming. One seems to threaten the severance of the tower from the arches of the porch, while the other runs from floor to roof through a couple of feet of stone and solid brick. The theory is that the tower—221ft. high and in some places 8ft. thick—has given way on the north side, and has fallen 13in. from the perpendicular. Strangely enough, there are no indications of subsidence below the level of the street. After the Great Fire which destroyed the Norman church, Wren used the arches and the solid Roman causeway for the foundation of his building. Some of the vaults, in which are mummies and several hundred coffins, have been closed since 1819, and until they can be inspected the extent of the damage cannot be precisely estimated. Steps are to be taken to insure the safety of one of the most interesting historical buildings in the City.

Architectural Absurdities. UNDER this heading Lord Greenock makes a suggestion for the improvement of public buildings in a letter to the "Daily Graphic" of last Saturday's date. He says "I am glad to see in your issue of today that Lord Wemyss and 140 members of the Upper House are making an effort to stem the tide of architectural absurdities which threaten to flood the metropolis. Novelty appears to be the only object in view, and 'novelty cannot be content to add, but it must deface.' Redundant decoration founded upon ridiculous false construction, freely applied! As an example, I would refer your readers to a perspective design of the School of Art Needlework in which the upper storey of the building is surrounded by pilasters supported upon brackets. As but one step further in the same direction may I be permitted to suggest that in the next design foisted upon a long suffering public all pilasters and columns should be inverted, resting on their capitals with their bases up in the air. No critic would be found bold enough to say this lacked novelty, and was not thoroughly up to date."

A Reply. In reply to the letter from Lord Greenock, "F. B. W." infers from the reference to Lord Wemyss that Lord Greenock classes the new War Office as an architectural absurdity. The writer goes on to say that one gathers that it is absurd because "novelty appears to be the only object." On this he remarks: "Now, is not novelty exactly the last quality one would impute to this scheme. Would one not rather call it a little formal and severe, as in my humble opinion it should be? Does it not closely follow the style of Inigo Jones's work? By no stretch of imagination can it be called novel. To come to the other example, the School of Art Needlework now being 'foisted upon a long-suffering public.' The pilasters of the upper storey rest upon the solid wall, not upon brackets as stated. There are, however, some pilasters at the angle of the building whose bases overhang the wall a few inches, and these are corbelled, but how can Lord Greenock so far have forgotten his architectural learning as to suggest that this is a novel method? It may be in his opinion an architectural absurdity, but it is, as he must remember when he thinks again, absolutely common both in Gothic and Renaissance work. I should like to bring to his recollection one building which he will probably acknowledge to be beautiful, namely, the Palacio de Monterey, at Salamanca. Here the pilasters of the upper storey of the whole façade are carried on brackets." The building which is the subject of Lord Greenock's criticism is illustrated in one of our centre plates this week.

Leeds and Yorkshire Architectural Society. We have just received the annual report for 1899 of this Society. It notes an increase in membership from fifty-three Members and forty Associates to sixty Members and thirty-nine Associates. The number of honorary members remains at twenty-two, the same as last year. Nine ordinary meetings and seven council meetings have been held since the publication of the previous report. The following prizes are offered for competition to all Associates of the Society:—The Society's silver medal and an additional prize of five guineas, offered by the President for measured drawings of any ecclesiastical or domestic building, or part of a building, erected anterior to A.D. 1800; a sum of three guineas, offered by the Society for the best design for a higher grade school for 400 scholars; a sum of three guineas, offered by the Society for drawings showing the construction of a dome 50ft. in diameter; a sum of two guineas, offered by the Society for the best essay on "The Drainage, Sewerage Disposal, and Water Supply of a Country House;" a sum of five guineas, offered by the President, for the best set of sketches done between November 1st, 1898, and October 1st, 1899. All drawings and work for these competitions must be delivered by October 1st, 1899. Further particulars can be obtained from the Hon. Secretary, at the Thoresby Society's Rooms, Old Medical School, Park Street, Leeds.

Boiler Explosions. The Manchester Steam Users' Association send us a pamphlet containing the annual memorandum of the Chief Engineer, Mr. C. E. Stromeyer, M.I.C.E., dealing with matters of general and technical interest, such as the moral responsibility resting on owners of steam boilers, even after they have insured them, the best type of boiler for any particular service, some experiences as regards causes of boiler explosion, more particularly the influence in this respect of last year's dry weather, an exhaustive analysis of over 200 furnace collapses and experiments, including the German Admiralty experiments, which have not been previously published here.

The Association's Work. The Steam Users' Association was founded in 1854 for the purpose of preventing steam boiler explosions by competent scientific inspection of the boilers. After a boiler has been examined and found fit for its working pressure the Association gives a pecuniary guarantee of its safety to the extent of £1,000 or £2,000. In the event of explosion this guarantee covers both loss of life and property, as well as claims under the Employers' Liability Act and the Workmen's Compensation Act. The Association does not guarantee boilers on the principle of averages, but as the result of competent scientific inspection; its object is Prevention not Compensation. The Association is not a Joint Stock Company; there are no shareholders to whom dividends are paid out of the members' subscriptions, but the income is appropriated solely to promote the direct objects of the Association. The Committee of Management is elected annually at a general meeting of the body of shareholders. The pamphlet will be found most useful to all users of boilers.

A Street Cleaning Elephant. It is stated that the streets of Chicago are at present being cleaned by an elephant. In itself the fact would be remarkable, but it becomes doubly so when the elephant in question is not a real one, but an animal made of steel, which is being tried with a view to seeing whether it is to be adopted as the regular street-cleaner of the city. The work is done by means of the trunk, which is constructed of hundreds of steel bands linked together, giving it a perfect suppleness, while in the head is a powerful automatic bellows, and in the inside of the animal is the machinery by which it is propelled and by which it is worked. If this fashion spreads, the streets of many of the great cities will resemble peripatetic zoological gardens or parts of a circus parade. Perhaps the next invention will be a window-cleaning giraffe.

Sir John Millais's Grave. In a letter to the "Times" of August 11th, Mr. Algernon Ashton calls attention to the fact that there is not yet any indication of Sir John Millais's resting place. He says: "On August 13th three years will have elapsed since Sir John Millais, the greatest English painter of modern times, passed away after a long and painful illness. He was buried with befitting pomp in St. Paul's Cathedral, near to the graves of Leighton, Turner, Reynolds, and other illustrious masters of the brush. But, surprising to relate, there is as yet not the slightest indication of the exact spot where the remains of Millais lie interred. I myself happen to know that the grave is situated in the immediate neighbourhood of the resting-place of Sir Christopher Wren, but the rank and file of visitors can only ascertain this by asking an attendant. If the slab which will ultimately cover the grave of Sir John Millais is not yet finished, then I venture to suggest that a temporary tombstone with a short inscription should be placed upon the spot, as is at present the case with William Ewart Gladstone's grave in Westminster Abbey." The suggestion Mr. Ashton makes is a good one, and if there is no probability of the permanent tombstone being erected for some time, it should be carried out.

Hammersmith Churchyard. At a recent sitting of the Consistory Court of London, before Dr. Tristram, a petition was presented by the vicar and churchwardens for a faculty to authorise the laying out of the north-west portion of Hammersmith Churchyard as a playground for the scholars attending the church schools, which have recently been rebuilt. Evidence was given in support of the petition. The old church schools, which were in a dilapidated condition, have been rebuilt, a sum of £4,600 having been obtained for the purpose of defraying the cost of rebuilding. It was desired that the north-west portion of the churchyard should be laid out as a playground for the scholars attending the schools, and it was proposed to separate the portion so laid out from the rest of the churchyard by a paling. The Chancellor of London, in giving judgment, said the application was a somewhat unusual one. It appeared from the evidence that it was quite impossible to obtain any playground for the boys and girls. When the church was rebuilt remains and also thirty-five tombstones were removed from the churchyard to the north-west corner of the churchyard. The Court was asked to sanction the removal of the tombstones to another part of the churchyard, which it was prepared to do, and also to sanction the north-west portion, which covered a space of a quarter of an acre, being appropriated as a playground for the children. The north-west portion would be separated from the rest of the churchyard, and the boys' part of the playground would be separated from the girls'. The Court would decree a faculty as prayed.

Monument to Charles Garnier. The Committee for the erection of the monument to Charles Garnier recently met to choose between several sketches which have been presented to them by M. Pascal, of the Institute. His design consists of a base in red granite enriched by green granite which supports the bust of Garnier, by Carpeaux, between two allegorical figures, one glorifying the master architect and the other studying his work. These figures and the bust of Garnier will be in bronze. The site of the memorial is the centre of the recess formed by the double slope of Rue Auber, Paris. The monument will be distant from the rotunda of the library between three and four mètres. On the front of the monument there will be no other legend than the name of Charles Garnier and the dates of his birth and death, with, at the foot, the plan of the Opera House, cut in the granite.

The Roads Improvement Association. This association has just been incorporated. Its objects are (1) To circulate amongst ratepayers, county councillors, members of boards of works, road surveyors, and others having control of or employed in connection with roads, authoritative information upon all matters concerning the construction, maintenance, and repair of roads; (2) to confer with councils and vestries, gas, water, and electric companies, and other public bodies on all matters affecting roads; (3) to promote improvements in the laws regulating roads; (4) to engage and pay for professional advice, remonstrate with authorities who allow roads to suffer from want of repair or neglect, and, if necessary, take legal action to enforce the rights of the public and ratepayers; (5) to oppose and resist any proceedings calculated to deprive the public of any rights over such roads; and to take up the question of finger-posts and milestones, without which no road can be considered perfect. Offices have been secured at Lonsdale Chambers, Chancery Lane, and Mr. E. Dudley Ward is the hon secretary and treasurer.

L'Academie des Beaux Arts. The Academy has elected M. Philippe Gille as a member in place of M. de Comte Delaborde. The Grands Prix de Rome for Painting have been awarded as follows:—First: M. Louis Roger, born August 26th, 1879, at Paris, the pupil of MM. Jean-Paul Laurens and Benjamin-Constant; Second Grand Prix: M. Victor Guétin, born March 17th, 1877, at Saint Denis (Seine), pupil of MM. Jules Lefebvre, Benjamin-Constant and T. Robert-Fleury; and M. Laurent Jacquot-Defrance, born April 22nd, 1874, at Perthus (Pyrénées-Orientales), pupil of M. Bonnat. The Grands Prix de Rome for Sculpture have been awarded as follows:—First: M. André-César Vermare, born November 27th, 1869, at Lyon

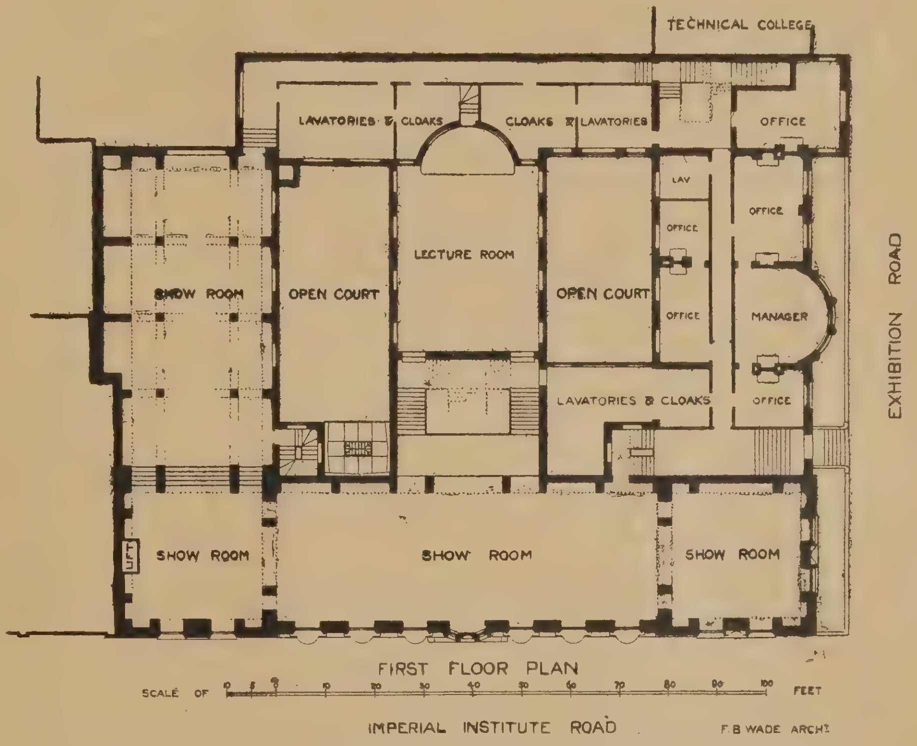
(Rhône), pupil of MM. Falguière, Marqueste and Lanson. Second: M. Alphonse Camille Terroir, born November 12th, 1875, at Marly (Nord), pupil of M. Barrias; and M. Louis-Henri Bouchard, born December 13th, 1875, at Dijon (Côte-d'Or), pupil of M. Barrias. The subject for this prize was the grief of Adam and Eve over the corpse of Abel. The Troyon prize, for which the subject was the harvesting of seaweed along the coast, has been awarded to M. Alphonse Cellier, born September 17th, 1875, at Gardanne (Bouches-du-Rhône); honourable mention has been accorded to M. Didier-Marie Calvès, of Paris, M. Jacques Simon, of Paris, and M. Abel Bertram, of Saint-Omer. The Bordin prize (value 3,000 francs), for which the subject was the influence of the study of archæology in general on architecture, has been divided among the following authors of essays:—1,500 francs to MM. André Berard and Alfred Berthier, of Paris; 1,000 francs to M. Henri Chabœuf, vice-president of the Académie de Dijon, of Dijon; 500 francs to M. Georges, architect, of Lyon. The Houllevigne prize (value 5,000 francs) has been awarded to M. Mayeux, architect, for his work entitled "Fantaisies Architecturales." The Bailly prize (value 1,500 francs) is taken by M. Fauré for his publications on architecture.

Caerwent Exploration Fund. In view of the success attained by the excavations carried out by the Society of Antiquaries at Silchester, the site of the Calleva Atrebatium of the Romans, it is proposed to excavate and explore in a similar way some of the portion of the Roman remains at Caerwent, in Monmouthshire, the site of the ancient Venta Silurum. As is well known the efforts of the Society of Antiquaries at Silchester have met with marked success. A very large portion of the ancient City has been examined, and the streets and houses have been accurately planned. Many very interesting remains of the domestic life of the inhabitants have been found, and the discovery of a Christian Church close to the Forum may almost be said to mark an epoch in this branch of historical research. That the work so ably begun at Silchester, should be carried on with equal energy and care in other parts of the country is, it need not be said, a matter of first-rate importance, and steps have already been taken to excavate and explore the Roman City at Wroxeter, in Shropshire. A strong Committee for the administration of the Fund has already been formed. Donations may be sent to the hon. treasurer, Alfred E. Hudd, F.S.A., 94, Pembroke Road, Clifton.

The City of Venta Silurum. The City of Venta Silurum above referred to is situate on the Roman road between Isca Silurum (Caerleon) and Chepstow, and was one of the stations on the XIV. iter in the Antonine Itinerary. Like Caerleon, it doubtless dates its origin from the time of the subjugation of the Silures by Ostorius and Frontinus in the years 50-75 A.D. The city itself is rectangular (about 500 yards by 400 yards in extent), and a large portion of the ancient city wall is still standing. Relics of the Roman city are constantly being found, including several fine pavements; but the only systematic exploration that has been carried out was done by Mr. Octavius Morgan in 1855, when a house and some baths were excavated in the south-east quarter. A fine set of baths was discovered here, and a pavement which, with other things, was removed to Caerleon. With this exception the Roman antiquities found in this interesting site have perished, and no record has been preserved until the year 1893, when Mr. Milverton Drake, in conducting some building operations, found another house, and planned as much of it as time would permit. The houses and cottages of the more modern village of Caerwent will prevent a large part of the site being explored, but there are still some fields unoccupied by houses, and it is proposed to systematically excavate these and carefully plan the streets and houses, as has been done at Silchester. If possible the cemeteries will also be explored.

Professional Practice.

Aldershot.—The competition for the design for a new Masonic Hall at Aldershot has now been decided. Sixteen designs were sent in. The assessor was Mr. Edwin O. Sachs, whose experience regarding places of public entertainment is so well known. Mr. Sachs accorded the first premium to the design entitled "Labour and Refreshment," recommending the author to be commissioned to erect the building with certain modifications, and the Board of Directors have approved of his report. Mr. Sachs further reported that no second premium could be awarded, as no one design showed sufficient superiority over the remainder to merit this distinction. Mr. Sachs, in his report, pointed to the great superiority of the successful design above the others sent in, and considered that both in practicability and compactness of plan, as well as in its architectural rendering, it was by far the best piece of work presented, and did great credit to the author. On opening the sealed envelopes, the authors of the design were found to be Messrs. Clarence T. Coggin, A.R.I.B.A., and Thos. Wallis, of 15, York Buildings, Adelphi, London, E.C.



ROYAL SCHOOL OF ART NEEDLEWORK, SOUTH KENSINGTON. F. B. WADE, F.R.I.B.A., ARCHITECT.

Bridlington.—The Bridlington Grammar School was opened last Wednesday by Lord Herries, in the presence of a large gathering of persons from several parts of the East Riding. The school is built in the Renaissance style, and is a two-storied building. It is situated on the Bessingby Road, and has a southerly aspect. The block includes the head master's house and rooms for the assistant masters; it stands in its own grounds of about thirty acres, and has a perfectly open situation within view of the sea. The ground floor contains the main hall and schoolrooms, and the dormitories are upstairs. There is accommodation for from thirty to thirty-five boarders, and from seventy to seventy-five day scholars. The main hall is worthy of special note owing to its open timber pitch pine roof, which is entirely plain, straight from the joiner's hands, and there is not a nail or screw visible. The flooring is of the herring bone pattern, in pitch pine. Ventilation and drainage, as is only to be expected, have been brought as near perfection as is possible. The dining-hall is a very fine, open building, and ample kitchen and lavatory accommodation is provided. Attached to the school is a chemical laboratory. The architect was Mr. Bilson, Hull; and the clerk of works, Mr. W. H. Williams, for Messrs. Thompson, of Peterborough; the total cost will be about £10,000.

Gateshead.—The foundation stone of the new Drill Hall for the 2nd Battery of the 1st Newcastle Artillery in Leddell Terrace was laid last Wednesday. The hall is 80ft. long by 47ft. 6in. wide, with the main entrance from Liddell Terrace in the centre. At one end of the hall are officers' quarters, with private entrance from the front street, orderly office, clothing store, armoury, and harness-room, with archway leading to the parade ground. Above these, on the first floor, are the caretakers' quarters, and gallery the full width of the hall. At the other end of the hall are the sergeants' mess, gunners' mess, lavatories, &c., and small yard. The building is of red brick with stone dressings. The contractor is Mr. E. T. George, of Newcastle, and the architects are Messrs. Watson and Curry, 18, Grainger Street, Newcastle, under whose supervision the building will be carried out.

Kensington.—We publish this week a plan and elevations of the Royal School of Art Needlework, the foundation stone of which was laid by the Prince of Wales on June 23rd. The new building is intended for the permanent housing of the school, which has for about twenty-five years occupied temporary premises in the Exhibition Road, next the Technical College. The school is also making arrangements to establish classes for teaching and practising other forms of applied arts. The building consists of large showrooms, workrooms, studios, a quantity of moderate-sized classrooms, and offices for management. The materials used externally are Portland stone and blue pennant for the walling of the principal storey, and Portland stone for the upper part. Mr. Fairfax B. Wade, F.R.I.B.A., of 148a, Sloane Street, S.W., is the architect, and Messrs. G. H. and A. Bywaters are the contractors. The elevations are given in one of our centre plates.

Llandaff.—The house illustrated in one of our centre plates has recently been erected for Wm. Taylor, Esq., M.D., J.P. It stands in a good position on the Llandaff Road, about one and a-half miles from Cardiff. It is built of best red bricks (Dennis, of Ruabon), the dressings being of Bath stone. The walls are built hollow, the walls of cellar cavity being filled up with White's rock composition, the windows are glazed with plate-glass, roof is covered with red tiles from Lewis, of Cannock, the soil drains are laid with Macfarlane's 4in. glass-glaved iron pipes, and careful attention has been paid to ventilation, both inlet and outlet. The hall runs up to the roof, and is lighted by a large window, filled with tinted ambetti glass, in scroll design, by Savell and Co., London. The hall and passage floors are laid with oak and teak blocks, and the porch with mosaic. The baths, closets, &c., are from the works of Doulton, of Lambeth, on the latest improvements. Hot water pipes are of copper. The work has been carried out by Messrs. E. Turner and Sons, of Cardiff, from the designs, and under the supervision of, Mr. C. B. Fowler, F.R.I.B.A., of Cardiff. The cost of house, boundary walls, gates, and laying out ground amounts to close on £4,000.

Perth.—A new hall is to be erected at Almondbank under the supervision of Messrs. M'Laren and Mackay, architects, of George Street, Perth. The building is of simple design, and consists of a public hall having accommodation for nearly 300 people, a committee-room, a ladies' room, and other conveniences. The front elevation is of terra-cotta bricks with stone facings, while the roof is of green Craigielea slates with red tile ridges. The building is properly ventilated, and well lighted from the front and sides. The main entrance will be from the front, while there are also entrances from the sides which communicate with the committee and ladies' rooms. A large and commodious platform will be erected at one end of the hall, while the interior will be suitably varnished and painted.

Plymouth.—Public services were held at the beginning of last week to mark the completion of structural alterations at George Street Baptist Church. The alterations consist of a new organ chamber, 52ft. long, between the church and the lecture hall, a new vestry and a blower chamber for the hydraulic engines without the main walls. The main east wall of the church has been cut through in three places for the transmission of sound and for the central organ case. The side apertures have been filled with carved and moulded teak tracery frames, enclosing artistic wrought metal work. The central opening is occupied with the organ front, the chief feature of the scheme. This front consists of an elaborately carved oak case springing from the rostrum floor and ascending to the ceiling with three separate tiers of pipes, each surmounted with a carved canopy. The pipes are decorated in a manner to harmonise with the general features of the oak case and its surroundings. The whole of the central work has been designed and executed entirely in Plymouth, Messrs. Hele and Co. having executed the organ and organ case, Messrs. Trevenen the carving, Messrs. Harris and Son the decorations, and Mr. W. Partridge the structural alterations. The designs for the whole of the work were by Mr. A. S. Parker, architect, Plymouth.

Weston-super-Mare. — The foundation stone of Weston-super-Mare Free Library and Museum was laid recently. The estimated cost of the building is £6,000. The first section will consist of two stories, and will occupy an area of some 3,000 square feet. The ground floor accommodation comprises a ladies' room, librarian's room, reading room, lending and reference departments, and the entrance hall; also lavatory accommodation for both sexes. The museum and picture gallery will occupy the upper floor, and will be approached by a wide staircase. The building will have fireproof floors and staircases. The materials employed in the structure will be local blue stone up to the plinth level, and red Cattybrook bricks relieved by freestone dressings and carvings. Messrs. Hans F. Price and Wilde and Fry, of Weston-super-Mare, are the joint architects, and Mr. Charles Addicott is the contractor.

Wigan.—The New Royal Court Theatre has been remodelled from designs by Mr. John P. Briggs, of Effingham House, Arundel Street, W.C. The entire auditorium has been gutted and reconstructed. The dress and family circles are entered from King Street. A glass canopy has been erected along the whole of the front of the theatre for protection in inclement weather. The two tiers are supported by iron columns, and the sight lines have been carefully worked out to enable every occupant to obtain a clear and uninterrupted view of the stage. The foyer, dress circles, and bar saloons have been decorated and placed well away from the auditorium. A complete installation of electric light has been erected. The decoration of the theatre has been carried out in French Renaissance style. The prevailing tints are cream, buff and gold, relieved by rose-pink and smoky blues. The centre portion of the ceiling is domed and divided with open scrolls, worked with bold cornices and enrichments. The proscenium opening is flanked on each side with an enriched frame from which springs ornamental bracketing. The walls of the auditorium are covered with Japanese paper. The joinery work has been done by Messrs. Lomax Bros., of Platt Bridge; the foyer and saloons, seating, upholstering, fibrous plaster, draperies, and general decoration of the auditorium and saloons have been carried out by Messrs. A. R. Dean, Ltd., of Birmingham and London; electric light installation by the Corlett Electrical Engineering Co., Wigan and Newcastle; and the grand entrance and general painting by Messrs. Lea and Sons, Rodney Street, Wigan.

Tennyson Memorial.—At the beginning of last week the Bishop of Ripon unveiled a window which has been placed in Haslemere Parish Church, as a memorial to the late Lord Tennyson. The subject of the window, which has been adapted from a design by the late Sir E. Burne-Jones, is "The Attainment," and represents Sir Galahad at the little chapel where the vision of the Holy Grail first comes to him.

The Leaning Tower at Wendlebury, which is attached to the old church, is to be pulled down. The church dates back quite 600 years, and its leaning tower at one time caused a good deal of discussion, but an examination showed that its declination from the perpendicular arose, not from any intention of the architect, but from subsidence. Lately it got so much worse that it is considered dangerous, and as underpinning is impracticable, it will be pulled down.

Proposed New Municipal Buildings for Walsall.—The report of a special committee of the Town Council, who have under their consideration the proposal to erect municipal buildings in Lichfield Street, recommends the erection of a town hall, municipal offices, and a public hall. The total cost of the scheme is considered to be about £55,000. The advisability of including an art gallery was considered, but the committee came to the conclusion that the outlay could not at present be afforded, although ample space would be left on which to erect an art gallery at some future date.

Ventnor Consumption Hospital.—The new Battenberg block of the Royal National Hospital for Consumption was opened last Wednesday by Princess Henry of Battenberg. The block, which comprises three houses, provides for the accommodation of twenty-one additional patients in as many separate sleeping apartments, all facing the south, the sitting-rooms (also facing the south) being in the proportion of one room for seven patients. The building was commenced in 1897, from designs by Mr. Theodore Saunders, architect, of Ventnor, and contains many improvements upon the old blocks.

New Patents.

The following abridged description is specially drawn for the Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all patent matters.*

988. Door Knobs, Attaching.—Patentee: C. A. Conder, of Elm Park Road, Finchley, N. —The lock spindle is of angular section, and fits into a corresponding hole in the handle. The spindle is screwed on its edges to receive a rose. The inner end of the handle and the part of the rose are externally screwed, and are connected, when adjusted in proximity, by a union. Rotation of the rose is prevented by some such engaging device as pins and holes, and the union is locked in its tightened position by a pin on a spring ring engaging a recess in the union. The pin can be pressed out of engagement when it is desired to unscrew the union. The other handle may be attached in a similar manner, or may be a plain fixed handle.

7,284. Fastenings and Furniture for Windows, Doors, &c.—Patentees: T. Burgess, of Thomas Street, and J. J. Burgess, of Fox Street, both in Congleton, Chester. A guide bracket fixed to the framework supports a sliding bolt. A worm mounted on a spindle on the bracket engages with a rack on the bolt. By rotating the worm the bolt is moved either into or out of the hole in the hasp or staple, the bolt abutting against the back of the hasp and staple, and so preventing rattling of the parts fastened. Used as a blind-cord adjustment, the bolt described above is fitted at one end with a knob or pulley, round which the cord is passed.

7,297. Moulding Bricks, Tiles, &c.—Patentee: R. Stanley, of Manor Court, Nuneaton, Warwickshire.—Moulding bricks, tiles, paving blocks, fuel, &c. The cam, which is mounted on the power-driven shaft, acts upon two rollers carried by frames connected by four slide rods; the rods are also united at the bottom by a frame. The cam is so shaped that it moves down the upper die plunger to compress the material in the die box, then raises it slightly, and finally lowers it still further; meanwhile the lower die plunger remains stationary, resting upon a fixed bridge piece, but spring supports of the die box are withdrawn, as the die nears the bottom of its stroke, by rods actuated by cams, and the die box is pushed downwards by pressure blocks. The feed box is also reciprocated by the cam by the gear shown. When the crosshead comes to its lowest position it is automatically latched to the spindle of the lower plunger, and on rising lifts the die with it and discharges the pressed article. Projections on the rods then lift the die box to its normal position, and a plate actuated by the feed box releases the latch connecting the crosshead and plunger so that the latter falls back upon the bridge. A screw adjustment allows the plunger to be raised above the bridge, when the crosshead is in its highest position, to regulate the amount of material received in the die box. To ensure the descent of the plunger when released, it is connected by a chain passing over a pulley to the operating lever of the plate; the chain is drawn tight as the feed box nears the end of its forward stroke. For forming perforated bricks, &c., the bridge carries a number of perforating-rods passing through the plunger and die and adapted to enter sockets in the die as it descends.

A New Wesleyan Church at Worthing is being erected in the Gothic style. The foundation stone was laid last Wednesday. The church will accommodate about 600 persons, and on the right of its doorway will be a square tower terminating at a height of 70ft. in an octagonal carved pinnacle.

Keystones.

The Bells of Bere Ferrers Church have been rehung at a cost of £112.

The Collossal Statue of Ferdinand de Lesseps, the work of Frémiet, has been cast.

The Grand Hotel Continental at Cairo is now being erected from the designs of M. Francesco Battigelli, architect.

A Stained-Glass Window, which has cost about £60, has just been placed on the north side of St. Paul's Church, Brighlington.

New Schools for the Enfield School Board are to be erected from plans by Mr. G. E. T. Lawrence, of 181, Queen Victoria Street, E.C.

The New Hospital at Millport is estimated to cost about £4,000. The ceremony of cutting the first sod took place last Wednesday.

A New Wesleyan Chapel is to be built in Parchmore Road, Thornton Heath, according to designs by Mr. F. Ledger, of 8, Philpot Lane, E.C.

Lauderdale House, Aldersgate Street, E.C., has been pulled down in order to give place to business premises of a more modern character.

A Free Picture Exhibition at Deptford will be opened at Sayes Court Hall on August 21st, and will remain open until September 3rd, Sundays included.

The Statue of the Duc d'Aumale by Gérôme, will be erected at Chantilly, at the end of September. The pedestal has been designed by M. Daumet.

The Members of the Sussex Archæological Society held their annual excursion last Thursday and spent a very pleasant time touring through West Sussex.

A New School is to be erected in Silver Street, Upper Edmonton, by the Edmonton School Board, from plans by Mr. H. W. Dobb, of 54 and 55, London Wall, E.C.

A New Wesleyan Chapel and Schools are about to be erected at Sandgate from designs by Messrs. Gordon, Lowther, and Gunten, of Finsbury House, Blomfield Street, E.C.

The Monument to Victor Hugo by Barrias, which it is proposed to erect at Paris in the square bearing the name of the great poet, will not be ready for three years.

The New Park at Benwell was opened last Wednesday by Mrs. Hodgkin. The park is the gift of Dr. Thomas Hodgkin to the people of Benwell, which is a suburb of Newcastle.

A New Fever Hospital for Perthshire is to be erected at Burghmuir. The contractors are Messrs. Spiers and Co., engineers, of Glasgow, and the total cost of the building is expected to be about £3,000.

New Factory Buildings, in connection with the Electric Railway and Tramway Carriage Works, Limited, Preston, Lancashire, are being erected on "The Marsh" by Messrs. T. Croft and Sons, from plans by Messrs. Garlick and Sykes.

Munificent Gift to Keighley. — Mr. Andrew Carnegie has expressed his willingness to give £10,000 to Keighley for a free library if the town will provide a site and adopt the Free Libraries Act. The offer has been cordially accepted.

Mr. Edwin O. Sachs has moved his general and private offices from No. 11, to No. 3, Waterloo Place, Pall Mall, to which address all communications should in future be directed. Mr. Sachs' telephone numbers are :—Nos. 5164 and 5165 "Gerrard."

New Church Hall at Newcastle.—At a meeting of the Town Improvements Committee of the Newcastle Corporation last Wednesday plans were submitted for the building of a church hall, &c., in connection with Blackett Street Presbyterian Church, on ground adjacent to College Road. The committee decided to make a survey of the site, and again consider the matter at their next meeting.

The Newcastle Society of Antiquaries recently visited the residence of Mr. Robert C. Clephan, South Dene Tower, Low Fell, to inspect his interesting collection of ancient weapons and defensive armour, and to hear a paper read about them.

A Fire at Sheffield Fever Hospital.—While painters were at work last Thursday on one of the administrative blocks the flame from one of their benzoline lamps set fire to the tar felt lining between the double wooden walls. There was no loss of life.

The New Smallpox Hospital at Leeds is to be built from plans by Mr. E. T. Hall, of London. It will accommodate 104 patients, and will consist of three large pavilions and two small isolated pavilions. The cost of the buildings is estimated at £61,781.

The Memorial Stones of a New Infant Department of the Sunday School at Wombwell were laid last week. The style of architecture is Early English, and the building will be of brick. Mr. A. B. Linford, of Wombwell, is the architect. The contracts are let for the sum of £506.

The Restoration of York Minster.—The fund for the restoration of York Minster now reaches £11,792 10s. 10d. The restoration of the east end will be finished in a few weeks, and as soon as the scaffolding at the west front is completed the restoration of the stonework will be commenced.

Quarry Accident at Thornton.—Last Wednesday morning a youth, named Irvine Robertshaw, met with an accident at Law Quarry. He was hewing a stone on a banker, when the banker gave way, rolling the stone suddenly on to his leg. His leg was severely crushed, and the bone broken above the knee.

A New Bank at Stratford-on-Avon.—The new banking premises of Lloyds, Ltd., at the corner of Bridge Street and Union Street, have been erected at a cost of about £6,000. Messrs. J. A. Chatwin and Sons, of Birmingham, are the architects, and Messrs. Collins and Godfrey, of Tewkesbury, are the builders.

The Millais Memorial.—A report by the Millais Memorial Sub-Committee issued last week shows that up to July 27th the subscriptions received amounted in the aggregate to £2,100 3s. The intention is to erect a bronze statue of the late Sir John Millais in front of the Tate Gallery. Mr. Thomas Brock, R.A., is the sculptor.

The Foundation Stone of a New Parish Room at Christ Church, Tunbridge Wells, was laid recently. The new building is to be of white brick, and will cost about £1,200. The parish room will be 55ft. by 25ft. with a class-room and kitchen at the rear. Messrs. Cronk are the architects, and Messrs. Strange are the contractors.

A Statue of the Virgin Mary is to be erected on the peak of Rocciamelone in the Italian Alps. This peak is always covered by snow and is 3,537 metres above the sea level. Queen Marguerite, of Italy, who has started the subscription list, will unveil the statue this month. The statue is the work of the sculptor Stuardi, and will be cast in bronze.

Gas and Allied Trades Exhibition.—The first annual Gas and Allied Trades Exhibition is announced to be held at the Royal Aquarium, Westminster, S.W., from Thursday, December 21st, 1899, to Tuesday, January 23rd, 1900. Mr. Josiah Ritchie is the president and managing director, and Messrs. M. J. G. Ritchie and T. G. S. Hersey are the organizers.

The Opening of a New Park and Hospital at Hebburn took place last week. The park is situated in the south of the town. The cost of the park is about £4,000, and the work has been carried out by Messrs. Cowper and Henderson, contractors, Jarrow, under the supervision of Mr. J. B. Renton, the surveyor. The hospital stands upon two acres of ground, and consists of administration block and wards. It is intended to accommodate about thirty patients. This building has been erected by Messrs. Cowper and Henderson, Jarrow, at a cost of £4,000, according to plans by Mr. J. B. Renton.

Extensions at the Keighley Workhouse.—The Keighley Board of Guardians at their meeting last Wednesday accepted tenders for the enlargement of the board-room, offices, and dining-hall at the workhouse, amounting to £1,144 16s. 11d. The individual contractors are :—Masonry, Mr. Edward Smith, Keighley; joinery, Mr. Ineson Taylor, Cross Roads; slating, Mr. Thomas Nelson, Bradford; plastering, Messrs. H. Spurr and Sons, Bingley; plumbing, Mr. J. Harrison, Keighley.

The New Stained-Glass Window in Dunbar Parish Church was designed and executed by Mr. Edward Frampton, of London. The window occupies the centre of the apse looking eastwards. On the tracery are figures of Faith, Hope, and Charity, and below is a six-light window, the three upper lights representing the Ascension, and the three bottom lights the Nativity.

The New Church at Stanton Hill, the foundation stone of which was recently laid by the Dowager Countess of Carnarvon, is to cost about £1400. Seating for 360 persons will be provided, and there will be nave, chancel, vestry, organ chamber, and west porch. The roof is to be open timbered, covered with red tiles, and surmounted with a small belfry. The architect is Mr. Percy H. Curry, of Derby, and the builder is Mr. R. Wilson, Skegby.

Tablet to Shakespeare.—It is proposed to erect a tablet to Shakespeare on the New Post Office Savings Bank, the ponderous pile of buildings running back from Queen Victoria Street to Carter Lane. The tablet will bear the following inscription: "Upon this site formerly stood the 'Bell in Carter Lane,' from whence Richard Quiney wrote the letter to William Shakespeare, dated the 25th October, 1598. This is the only letter extant addressed to Shakespeare, and the original is preserved in the Museum at his birthplace, Stratford-upon-Avon. This tablet was placed upon the present building by leave of the Postmaster-General, 1899."

The Atbara Bridge Contracts. — The reason the Americans obtained the contract for the superstructure at the Atbara Bridge is stated to be because the English could not do it quickly. This statement is contained in a Parliamentary paper just issued. Lieut.-Col. Gordon, who was asked to report on the circumstances of the contract, says, in his despatch, that the whole question was one of quick delivery For the final specification only one English firm made any offer, and that was the Patent Shaft and Axle Co., who required six months. The Pencoyd Iron Works, of Philadelphia, undertook complete delivery in six weeks and secured the order. Lieut.-Col. Gordon, in his despatch says: "I wonder that comment has not been made on the fact that the more expensive portion of the bridge was contracted for by an Italian firm; the answer to this being that there is only this single firm in Egypt possessing the required plant for sinking cylinders, &c., and until a British firm sets up a plant in this country I conclude that all bridges whose sub-structures are built as those of the Atbara and others will continue to be contracted for by this Italian firm."

A Canadian Engineering Feat.—The River St. Lawrence at the Travers is eight to nine miles wide, and it has been decided to substitute a lighthouse for the lightship which at present acts as a guide. The establishing of a foundation in 45ft. of tide-water was found to be no easy task, and to accomplish it a large pier was built of heavy timbers filled with rock and sunk on a bed prepared with stone. The pier was held in position by heavy anchors and by five steamers. It was then a stationary block upon which the superstructure could be raised. The next thing was to secure permanently the stationary block by surrounding it with masses of stone, and immense quantities were sunk, forming a protection which is confidently expected to prove solid enough to resist the heaviest weather. The stationary block is 28ft. deep, and at low tide is in 26ft. of water. The superstructure will stand 30ft. out of the water at high tide

CURRENT PRICES.

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ...	per cwt.	1 5 8	1 16 2
Colza Oil, English ...	per cwt.	1 3 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 8 9	1 9 0
Linseed Oil	per cwt.	1 1 0	—
Neatsfoot Oil	per gal.	0 2 6	0 4
Petroleum, American ...	per gal.	0 0 6¼	—
Do., Russian ...	per gal.	0 0 5¼	—
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 5 0	1 7 3
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 6 3	—
Glue	per cwt.	1 14 0	2 18 6
Lead, white, ground, carbonate	per cwt.	0 19 0	—
Do. red	per cwt.	0 17 3	—
Soda crystals	per ton	2 15 0	—
Shellac, orange	per cwt.	3 4 6	3 5 0
Do. sticklac	do.	2 2 6	2 15 0
Pumice stone, ...	do.	0 8 9	—

METALS.

Copper, sheet, strong ...	per ton	88 0 0	—
Iron, bar, Staffs. in London	do.	8 10 0	9 0 0
Do. Galvanised Corrugated sheet ...	do.	13 0 0	13 10 0
Lead, pig, Spanish ...	do.	14 15 0	—
Do. English common brands	do.	15 0 0	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	16 10 0	—
Do. pipe	do.	17 5 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 0 0	10 0 0
Do. floor brads	do.	8 15 0	9 15 0
Tin, Foreign	do.	142 2 6	142 12 6
Do. English ingots ...	do.	145 10 0	—
Zinc, sheets, English ...	do.	140 0 0	28 10 0
Do. Veille Montaigne ...	do.	31 0 0	—
Do. Spelter	do.	24 5 0	24 12 6

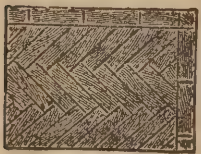
TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	do.	4 7 6	6 5 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Deals, Petersburg	do.	4 0 0	6 10 0
Do. Archangel 2nd & 1st	per P. Std.	10 10 0	—
Do. do. 4th & 3rd.	do.	12 0 0	12 5 0
Do. do. unsorted	do.	12 5 0	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	10 10 0	16 0 0
Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	10 0 0	10 15 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	9 5 0	16 10 0
Do. White Sea	do.	12 5 0	—
Do. Quebec Pine, 1st...	do.	18 0 0	19 0 0
Do. do. 2nd	do.	12 0 0	—
Do. do. 3rd &c.	do.	7 15 0	9 15 0
Do. Canadian Spruce, 1st	do.	9 0 0	10 5 0
Do. do. 3rd & 2nd	do.	6 5 0	7 15 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	7 0 0	8 10 0
Flooring Boards, 1 in. prepared, 1st	per square	0 9 6	0 12 0
Do. 2nd...	do.	0 8 9	0 10 9
Do 3rd &c.	do.	0 6 9	0 9 6

HARD WOODS.

Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4	0 0 4½
Do. Honduras	do.	0 0 3½	—
Do. Tobasco	do.	0 0 4¾	0 0 5½
Elm, Quebec	per load	4 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 4 7/8	—
Do. African ...	do.	0 0 3½—4 5/8	
Do. St. Domingo ...	do.	0 0 5 9/32	—
Do. Tobasco ...	do.	0 0 4 15/16—6 1/32	
Oak, Dantzic and Memel	per load	3 5 0	3 5 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	8 15 0	13 15 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown...	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 2 6	0 4 2



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COMING EVENTS.

Wednesday, August 16.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Ordinary meeting of the members. 8 p.m.

Saturday, August 26.

EXHIBITION OF WORKS OF ART AT KENDAL.—Last day.

Tuesday, Aug. 29, to Saturday, Sept. 23.

SANITARY INSTITUTE.—Eighteenth Congress and Health Exhibition at Southampton.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

EDMONTON.—For beerhouse at Edmonton, for Messrs. Whitbread and Co. Mr. A. Dixon, architect:—

Humphreys and Sons	£4,293	Salt and Sons	£3,979
Knight and Sons... ...	4,235	Godfrey and Sons ...	3,849
Howell J. Williams ...	4,029		

ENFIELD CHASE.—For rebuilding the "Little Wonder" beerhouse, Enfield Chase, for Messrs. McMullen and Sons, Limited, Hertford. Mr. James Farley, architect, Old Cross, Hertford:—

W. Barrett	£2,188	L. and W. H. Patman	£1,600
Hobbs and Son	2,077	Carnells, Limited ...	1,586
Lawrence and Son ...	1,779	Matthews and Son ...	,572
Fairhead and Son ...	1,655		

LONDON, N.E.—For rebuilding the "King's Arms" public-house, and shops and flats, Pritchard-road, Hackney, N.E., for the Lion Brewery Company, Limited. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural and Fittings.

Godson and Son	£5,993	Sheffield Bros.	£5,439
Whitehead and Co. ...	5,725	Ansell and Son*	5,353
Hooper and Son	5,577	Courtney and Fairbairn	5,229
Edwards and Medway	5,555		

Gasfittings.

Biggs and Co.	£155 13	Buckley and Beach*	£153 19

Pewtering.

Warne and Co.	£112 0	R. E. Lane*	£93 0
H. and F. Warne ...	103 10		

*Accepted.

LONDON, S.E.—For alterations, additions, and repairs to St. Paul's Schools, Walworth, S.E., and the erection of a manual instruction centre for the managers. Quantities by Messrs. J. Leaning and Sons, 28, John-street, Bedford-row, W.C. Mr. Philip A. Robson, architect, Palace Chambers, 9, Bridge-street, Westminster:—

		Allowance for old materials.
Lathey Bros.	£3,278	£30
Burman and Son...	3,150	Nil.
C. Ansell	2,940	£32
Holliday and Greenwood ...	2,894	Nil.
Balaam Bros.	2,866	£110
Garrett and Son*	2,691	50

* Provisionally accepted.

LONDON, S.W.—For a new boys', girls', and infants' school, St. John's, Clapham Rise, for the Board of Managers. Mr. Philip A. Robson, architect, Palace Chambers, 9, Bridge-street, S.W.:—

Jerrard and Sons ...	£3,500 0	G. F. Wright	£2,730 8
Rice and Son	2,811 0	Garrett and Son* ...	2,590 0

* Provisionally accepted.

LONDON, E.C.—For erecting new stores and workshops at the Flemming-street Depôt, for the Shoreditch Vestry. Mr. J. Rush Dixon, engineer:—

J. Ivory	£2,882	J. Godfrey and Son ...	£2,787
Thomeroon and Son ..	2,875	Jarvis and Son	2,767
R. Schooley and Son...	2,798	J. Weibking and Sons*	2,490

* Accepted.

LONDON, W.C.—For rebuilding Nos. 35, 36 and 37, Verulam-street, W.C. Mr. F. W. Foster, architect, 41, Bedford-row, W.C.:—

Bush	£1,927	Marsland...	£1,765
Lapthom	1,798	Whitehead	1,745
Woodrow...	1,797		

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Polished Granite Manufacturers,
ABERDEEN, N.B.
London Office: 64, FINSBURY PAVEMENT, E.C.
Quarries: PETERHEAD, N.B.

LONDON, S.E.—For rebuilding the "Masons' Arms," Besson-street, New Cross, S.E., and shops and flats adjoining, for the Forest Hill Brewery Company. Mr. W. M. Brutton, architect, 5, Green-street, Leicester-square, W.C.:—

Structural.

Hooper and Son	£1,215	J. Byrne*...	£1,030
Pritchard and Renwick	1,094		

Fittings.

Burman and Son ...	£280 0	Hooper and Son... ...	£225 0
Pritchard and Renwick	232 0	Byrne	167 10

Pewtering.

H. and F. Warne ...	£56 0	McPherson	£34 10
R. E. Lane	42 0		

Gasfittings.

A. Nathan	£63 10 0	Biggs and Co.... ...	£52 7 6

*Accepted.

LONDON.—For the substructure of Kennington (St. Gabriel's) College for training mistresses, for the executive committee. Quantities by Messrs. J. Leaning and Sons, Bedford-row. Mr. Philip A. Robson, architect, Palace Chambers, 9, Bridge-street, Westminster:—

Norris and Son	£3,795	Parnell and Son	£3,408
Dove Bros.	3,555	Garrett and Son* ...	3,200

For the Superstructure (with certain exceptions).

Parnell and Son... ...	£31,368	Lawrance and Son ...	£31,368
Patman and Fotheringham	31,980	Foster and Dicksee ...	30,780
		Garrett and Son* ...	30,565

* Accepted.

LONDON.—For new footbridge over the North London Railway, Poplar, for the Board of Works for the Poplar District. Mr. Oliver E. Winter, Engineer. Quantities by Mr. Jno. R. Hunt, Bridge House, 181, Queen Victoria-street, E.C.:—

For Brick and Stone Abutments.

Dolman and Co.	£1,498	Engineer's estimate ...	£1,138

For Steel Bridge.

Matthew Shaw and Co.	£1,314	Jukes, Coulson, & Co.	£1,036

[Engineer's estimate, £905.]

LONDON, E.—New underground convenience, Bow-road, E., for the Board of Works for the Poplar District. Mr. Oliver E. Winter, Engineer. Quantities by Mr. Jno. R. Hunt, Bridge House, 181, Queen Victoria-street, E.C.:—

Dolman and Co.	£2,100	W. Johnson*	£1,700
Jennings and Co. ...	2,050	Finch and Co.	1,689
Thomas and Edge ...	1,927	* Accepted.	
A. E. Symes	1,915	[Engineer's estimate	1,900]

LONDON, S.W.—For the erection of a sub-station for the Chelsea Electricity Supply Company, Limited, at Milner-street, Chelsea. Mr. Alfred Roberts, architect, 18, Nelson-street, Greenwich, S.E.:—

Higgs and Hill	£5,124	F. and H. F. Higgs ...	£4,617
Killby and Gayford ...	4,694	Holliday & Greenwood	4,544
B. E. Nightingale ...	4,635	Lole and Lightfoot*...	4,496

*Accepted.

LONDON, S.W.—For repairs and decorations at No. 59, Christchurch-road, Streatham-hill, S.W., for Mrs. Annie Slade-Jones. Messrs. Clarke and Hutchinson, architects, 28, John-street, Bedford-row, W.C.:—

J. Selway and Sons ...	£263	Chas H. Marrison	£176
Crabb and Son...	203	Philip Clark*	145

* Accepted.

LONDON, S.E.—Accepted for the rebuilding of shop and premises, No. 911, Old Kent-road, S.E., for Mrs. M. A. Chalk-Caterham, Surrey. J. Halsted Waterworth, architect and surveyor, 281A, Queen's-road, New Cross Gate, S.E.:—

Sidney R. Best, Brockley £751

LONDON, S.E.—Accepted for the rebuilding of shop and premises, No, 899, Old Kent-road, S.E., for Mrs. M. A. Chalk-Caterham, Surrey. J. Halsted Waterworth, architect and surveyor, 281A, Queen's-road, New Cross Gate, S.E.:—

Sydney R. Best, Brockley £855

LONDON, S.E.—Accepted for the erection of an addition to "Buchanan," Queen's-road, New Cross Gate, S.E. J. Halsted Waterworth, architect and surveyor, 281a, Queen's-road, New Cross Gate, S.E.:—

Sydney R. Best, Brockley £349 10

LONDON, S.E.—For sundry alterations and additions to No. 289, Queen's-road, New Cross Gate, S.E., for Mr. R. Wilson Cameron. J. Halsted Waterworth, architect and surveyor, 281a, Queen's-road, New Cross Gate, S.E.:—

Sydney R. Best ...	£289 0	J. and A. Oldman, New Cross *... ...	£158 0
G. Simmonds & Son	235 10		

* Accepted.

LONDON, W.—For additions and repairs to a house, Gt. Charles-square, W. E. J. Paine, architect. Quantities not supplied:—

Whiteley, Ltd. ...	£1,448 0	Colley and Son ...	£1,112 15
Stimpson and Co....	1,208 0	T. D. Steed and Son	1,043 10

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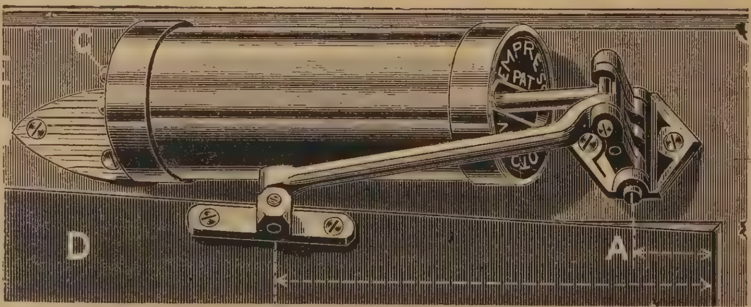

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THE VENTILATION OF SEWERS AND DRAINS.*

By R. READ, Assoc.M.Inst.C.E.

(Concluded from page iv., No. CCXXXV.)

At the Westminster district meeting of this Association in February, 1898, an important discussion occurred upon the subject of sewer ventilation, with a view to deciding the course of action to be taken by the metropolitan surveyors at a conference which had been arranged between them and the medical officers of health to the London vestries. At this district meeting, two propositions were discussed, the one to increase the number of the road surface ventilators, by placing them every 50yds. apart on the sewers, and the other to pass a law compelling every building owner in future to provide a shaft in the front of his house, to ventilate the drain on the sewer side of the interceptor. After considerable discussion both propositions were carried, and at the conference afterwards held with the medical officers of health, Sir Alexander Binney in the chair, the shaft proposal was adopted for recommendation to the London County Council.

Proposed Reforms Criticised.

These two propositions are somewhat destructive of each other, because the ventilation will take place in the direction of the line of least resistance, and if you increase the number and area of the road surface gratings in proportion to the outlet shafts above the houses, you weaken the velocity and get a liability to stagnation or reversal of current, owing to its feebleness; that is to say, the greater the number of shafts between each pair of manholes, the stronger is the initial velocity of the air entering the manhole gratings, especially if the latter are kept small; and a strong initial velocity at the road surface inlet is necessary to enable the current to reach the furthest outlet shaft between the two inlets. To take an ordinary example in a suburban district, in a distance of 100yds between a pair of manholes, it is possible to have fifteen houses on each side of the street, and if each house drain was ventilated by a 4in. soil pipe carried up above the roof, the sum of their outlet areas would be 12½ square inches by 30=375 square inches. These would all be drawing air in at the upper manhole, having, say, 36 square inches of surface grating openings, or a ratio of more than ten to one in favour of the shafts being outlets; and a velocity of, say, 1ft. per second discharging from the thirty outlet shafts, would cause the air to enter the 36 square inches of manhole grating at the road surface, with a velocity of not less than 10ft. per second,—without any allowance for friction through the pipes. There is no occasion for alarm at this proposition, as the popular idea that the more ventilation the more sewer gas is entirely wrong, because the more perfect the ventilation the less sewer gas is formed. The proposal agreed to by the London Conference increases the number of ventilating shafts to be provided by the house owner while retaining the intercepting trap, and is a compromise which does not strike at the root of the evil; the owner is more likely to consent to abolish the trap as it would be less expensive to him, and in the author's opinion more beneficial both to the owner and the community at large. The soundness of the drain should be tested when the trap is taken out, especially if the drain passes under a house.

Need for Fresh Air.

Decomposition is the fate of all organic matter, and if this takes place in a confined space with imperfect ventilation, putrefaction is the result, as distinguished from decomposition, but in the presence of an abundance of fresh air or oxygen, decomposition is effected without producing a nuisance. But, as has before been stated, the sewage itself should not remain long enough in a sewer to decompose, and the only thing which the ventilation has to deal with in a system of well designed and constructed sewers and drains is the vapour-laden air, and it is to prevent this from becoming putrified by stagnation that the ventilation is absolutely necessary. As an illustration of this a considerable quantity of manure can be spread on a garden in the open air without creating a nuisance, but a very small quantity indeed shut up in cupboard would make any house untenable.

Conclusion.

Good ventilation cannot be obtained by surface gratings only, nor by shafts only, especially if the latter consist of one 6in. shaft at the top end of the sewer, but it can only be obtained by a combination of both proportioned and located in the manner described by the author. Then come in the legal and sentimental difficulties, because the law says the sewers belong to the local authority and the drains belong to the householder, and must be treated separately; but this is contrary to the great laws of Nature which govern the subject, and so long as this antagonism exists, so long shall we have complaints of sewer gas.

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* A paper read at the annual meeting of the Incorporated Association of Municipal and County Engineers, held at Cardiff, June 29th, June 30th, and July 1st, 1899.

SANITARY INSPECTORS' CONFERENCE AND HEALTH EXHIBITION.

BY OUR SPECIAL CORRESPONDENT.

LINCOLN was this year selected by the Sanitary Inspectors as the city wherein to hold their annual congress, and the worthy Mayor (Alderman Wyatt), ably assisted by the City Member (Mr. C. H. Seely, M.P.), the City Sherriff (Mr. J. H. Foster), Dean Wickham, Dr. Lowe, and the City Council, gave the Congress a right royal welcome; and everything possible was done for the comfort and pleasure of the visitors.

The conference opened on August 3rd with a reception in the Guildhall, after which Mr. T. J. Moss-Flower, C.E., M.S.I., the Chairman of the Sanitary Inspectors' Association, in the absence, owing to illness, of the President (Sir John Hutton), read the annual address, of which the following are a few of the salient points:—

The Association's Work.

The Association was founded in 1883, incorporated in 1891, and the membership now numbers upwards of 700. There are five branches operating in various parts of England, from the extreme south-west to the farthest northern portion. It is expected that a branch for Ireland will be shortly formed. In addition to several other committees for carrying on the work of the Association, there is a Parliamentary Committee, the duties of which are to carefully watch all Bills brought into the House of Parliament which in any way bear upon the work of sanitary inspectors; these are carefully examined and the progress they make carefully noted, and when it appears to the committee, acting on instructions from the Council, that amendments or modifications of them are necessary, representations pointing such out, are made to the proper authorities; members of Parliament are interviewed by deputation and otherwise, and other action is taken according to the requirements of the case. A scheme for benevolent fund has been prepared and it is expected that either in its present form or as may be modified by the Council, it will be approved. The fund does not partake of the nature of a sick benefit fund, nor is it to be in any way dependent on the funds of the Association. It is to be supported by voluntary contributions from the members, donations, bequests, &c. The object of the fund is to give relief in necessitous cases to sanitary inspectors, or to their wives and families, in times of distress. Thus it will be seen that the Association is doing a very useful work, and such as must commend itself to all who are desirous of preaching and practising the "Gospel of Health."

The Modern Sanitary Inspector.

The time for the old-fashioned inspector has passed. What is now required is a man with a good knowledge of a very large number of subjects, in many of which he must be expert. He must have a good knowledge of the various Acts of Parliament affecting his duties—including Public Health Acts, Food and Drugs Acts, Infectious Diseases Notification Act, drainage by-laws, factory Acts, and all the by-laws and regulations affecting slaughter-houses, dairies, farms, milkshops, offensive trades, canal boats, tents, vans, sheds, and similar structures, and other special premises. He must also have an expert knowledge of drainage, plumbers' work, ventilation, sanitary appliances, water supply to houses, and the sanitary requirements of all classes of dwellings, and many other things too numerous to mention. In addition, he must possess a good nose, and a keen sight: must be resourceful, diplomatic, courteous—sympathetic when dealing with poor people, firm when dealing with unscrupulous evaders of the law—qualities probably necessary in all walks of life, but most essential characteristics to make a good sanitary inspector.

His Relations with Local Bodies.

It is no doubt strange to many, though nevertheless true, that most of the sanitary inspectors throughout the country are elected only for twelve months at a time, and it is left entirely in these cases to the goodwill of the council whether they will elect them again after the expiration of their term of office; and there are many cases on record where great injustice has been done to an officer who has been a little too exacting in his requirements to please certain property owners who are on the council, and he therefore makes enemies of these men, and should they be in a majority on the council, then he has to go, or be subject to no end of tyranny. It is believed, therefore, that the public health suffers by reason of the inspectors being unable to properly carry out their duties for fear of loss of office. We are now seeking to get passed through Parliament a Bill to give to sanitary inspectors secure tenure of office, and we hope that the Town Council of Lincoln will support us in this matter, by requesting their Parliamentary representatives to support the Bill when introduced to the House.

Women as Sanitary Inspectors.

There is one thing I think we should all hail with delight, and that is the appointment of women as sanitary inspectors in some of the larger towns. I do not mean to say that women are fit and capable of discharging the whole of the duties, which under the present legislation men inspectors have to perform, but there are certain spheres of labour in which they can do excellent work, work which cannot be done by men. In inspecting the homes of the poorer classes, and instructing the inmates in the rudiments of the laws of health, cooking, nursing, and the proper care of children, &c., there is much that women can do.

Public Health Acts.

We have been hoping to see some signs of the probability of the unification or consolidation of the various Public Health Acts in one single Statute, with the repeals and amendments, so desirable in the interest of the public health, embodied therein. It is now twenty-four years since the General Act for England and Wales was passed. Since then there have been numerous additions and alterations. I will not, however, weary you by reciting them. It will no doubt be sufficient for me to say that it is most difficult for any one not having a trained legal mind to grasp the meaning and intention of the legislators, and there have been known instances where even legal minds have failed to grasp the meaning. But an inspector, in order to carry out his duties promptly, must clearly know what are his legal rights, powers, &c., and this knowledge, under present conditions, is most difficult for him to acquire. What is wanted is, as I have already said, one comprehensive—yet very clearly worded—Public Health Act, to displace the many bits of Acts we now have.

How the Acts are Evaded.

I am prepared to admit that many of the requirements of the Public Health Acts in many districts are a dead letter. The laws of the land are evaded right and left by the local authorities throughout the land, not so much the Town Councils, but more particularly by the smaller District Councils in rural and semi-rural districts. I could cite numberless cases of evasion if time permitted. I will just take one instance, and this occurs in districts where the inspector and surveyor is one and the same man. The salary perhaps is £150 per annum—£130 as sanitary inspector and £20 as surveyor. The surveyor's work includes, among many other duties, that of superintending the cleansing and repairing of all roads within his district, looking after, preparing, extending or amending sewerage schemes, sewage disposal works, water works, and other similar works, examining plans of new buildings, seeing to the erection of buildings, looking after men, paying wages, keeping a lot of books—many of them unnecessary—&c., &c.; for all this he gets £20 per annum. In many instances he is engaged nearly the whole of his time, and the little time he can spare from his duties as surveyor he gives to the hundred and one things required of him as sanitary inspector, and the result is that the sanitary inspector's work gets neglected.

More Officers Needed.

Now, the point is this, he gets £130 per annum for the little work he does as sanitary inspector. In other words, he gets thirteen-fifteenths of his salary for doing what takes him two-fifteenths of his time, and two-fifteenths of his salary for doing what takes the remaining thirteen-fifteenths of his time. Why not put £130 down for performing his duties as surveyor and £20 as inspector? The reason for doing this is, the Local Government Board allows from the County Council a remittance to the officer's District Council of half the amount paid to him for performing the duties of sanitary inspector. So that by making the inspector's salary £130, the District Council pockets £65, whereas, if the salary attached to the sanitary inspector's office was £20, they would only get £10 returned. Thus the intentions of the legislators are defeated, and many districts which are thought to be subject to efficient sanitary inspection, get very little. The remedy is to separate the offices or furnish the chief official with qualified assistants to perform the necessary inspection. It may well be said then, that what is required now more than increased legislation, is a more effectual carrying out of the present Acts of Parliament, which as I have already said, are lying dormant in many districts. Truly, there are not enough officers employed to do what is required. There is many a district in this country which satisfies its conscience by allowing its sanitary authority to employ a man to give a part of his time at a salary of from £20 to £50 per annum. A separate Health Department, with a Minister with Cabinet rank at its head, might deal successfully with important matters of this kind, and it is hoped that such a Department may soon be established.

The Health Exhibition.

Later in the day the Health Exhibition was opened by the chairman of the District Council (Mr. W. Embleton-Fox), supported by the Mayor, the Dean, the city member, and other influential citizens. In the evening the Mayor gave a garden party at the Arboretum, which was well attended by the visitors and many of the leading citizens of Lincoln.

The exhibition consisted of fifty-eight stands of trade exhibits, besides which there was on view a most interesting and instructive loan exhibition, contributed to by Dr. Wight Mason, medical officer of health for Hull, Prof. Windbe, of Mason's College, Birmingham, Dr. Robertson, health officer, Sheffield, Dr. Carline, of Lincoln, and others. We noticed many old exhibitors, whose specialities have on previous occasions been favourably noticed in our columns; one or two new features, however, merit a few words.

Messrs. J. F. Ebner, of 150, Old Street, London, E.C., showed some excellent samples of oak flooring, laid direct on the concrete bed by a patent hydrofuge system. This exhibit had already done duty at the Chicago Exhibition, where it obtained the highest award for ingenuity and efficiency.

The Sanitas Co., Ltd., of Bethnal Green, had a large and varied display of their various excellent preparations, which were much admired.

Messrs. Tomlinson and Hayward, of Lincoln, also had an interesting display of their specialities, such as disinfectants, &c., and also their butter powder and Danish Butter Colour—vegetable compounds for which they claim fifty years' successful use.

Messrs. Peter Spence and Sons, of Manchester, had a large and varied display of aluminoferric, and their many extracts from sewage sludge, such as "Concentrated Fertiliser," sewage effluent, &c.

Messrs. Burroughs and Welcome had a very handy, and most useful, "Water Analysis Case."

Messrs. Twyford, Limited, of Hanley, whose various exhibits occupied nearly half the large hall, were drawing particular attention to their sinks, slop hoppers, and wash tubs. A most interesting and, to our mind, useful exhibit, was their doctor's sink and wash basin, so constructed that by a system of pedals the hot or cold water, disinfecting tap, or waste pipe, could be turned on or off, thus avoiding the necessity of the hands coming in contact with any part of the basin or taps until thoroughly disinfected and washed, a most important factor in the case of operations, &c., in a large hospital or infirmary. Great interest was shown by many of the inspectors in the slop hoppers also exhibited at this stand. The simplicity of work was specially noticed, and the perfect prevention given to the possibility of sink pipes becoming fouled or choked by refuse carelessly thrown with slops into the sinks. Messrs. Twyford's adamant urinals, Twycliffe syphonic, and other wash-down closets are too well known for us to mention them further. This stand, No. 12, was decidedly one of the best features of the exhibition.

Messrs. Oates and Green, Ltd., of Halifax, had a good display of their salt-glazed ware, and a large variety of pipes, gullies, feeding troughs, and wash tubs. To this firm has been awarded the silver medal, the highest award, for general excellence of sanitary exhibits.

The Septic Tank Syndicate were again to the fore. We were pleased to notice that their present model is a great improvement on that which we saw at Birmingham last year. The process seems simplified, and is certainly more easily appreciated by interested visitors.

The Wade Disinfectant Syndicate, who seem to contract for and supply all branches of the Government, had a varied display of their simple closet automatic disinfector, patent sulphur candles with asbestos covering, and other popular and powerful germ killers.

Messrs. Doulton and Co., Limited, who also had a large exhibit, were showing some handsome ware and vases, mantlepieces, tiles, &c., in addition to their usual display of baths to meet all classes and requirements.

Messrs. Battle, Maltby, and Bower, Lincoln, showed a large assortment of fluid and powder disinfectants, fumigating powder, carbolic soaps, &c.

Mr. Chas. Duckering, Waterside Works, Lincoln, had an excellent collection of their various goods, such as mantlepieces, grates, stoves, fenders, &c., all finished in the highest style. One open and close kitchener deserves special notice, with its bright fittings, tiled covings, tiled oven bracket shelf, adjustable bottom grate with tile hearth and curb complete.

Edinburgh Glaziers have obtained the advance asked for, of ½d. per hour on their wages. The standard wage is now 8½d. per hour.

Masters and Men.

The Strike of Joiners at Huddersfield is now over. At a recent meeting the joiners of Huddersfield and district considered a report as to a meeting of the representatives of the men and the employers on the previous Thursday, and to determine whether the terms of settlement provisionally agreed upon should be accepted. After discussing the matter for nearly two hours the terms were unanimously ratified. The men's demand for an advance of ¾d. per hour is acceded to, making their wages now 8½d. per hour. The men resumed work last Wednesday.

The Danish Labour War.—At a general meeting, last Monday week, of the representatives of the trade unions affected by the great lock-out in Copenhagen it was decided, after eight hours' debate, to accept the draft of a general settlement arranged by the Presidents of the Employers' Federation and the Joiners' Union, 128 votes being given in favour of its acceptance, and 99 against it. The reservation was, however, made that the points in dispute in the joiners' trade should first be settled in detail, and that no workshop regulations should be introduced without a consultation between the mens' and the employers' organisations. The directors of the Employers' Federation last Wednesday informed the trade unions affected by the lock-out that the reservations made at the general meeting could not be accepted, and that the lock-out could not be ended until they had been withdrawn.

The Building Trade Dispute.—In accordance with a suggestion made at the conference in London just over a fortnight ago, a meeting between representatives of the Yorkshire Federation of Building Trade Employers and representatives of the London Order of Bricklayers was held at Leeds at the beginning of last week. The masters were represented by Mr. W. Nicholson and Mr. Henry Hodgson (Leeds), Mr. G. H. Walters and Mr. T. Goates (Hull), Mr. Mansfield (York), and Mr. Ullathorne (Selby); while the delegates for the men were Mr. J. Batchelor (the general secretary of their order), Mr. Geo. Carr, and Mr. T. Newlove (Leeds), Mr. M. Emmerson (Hull), Mr. H. H. Diver (Sheffield), and Mr. C. Spence (York). Mr. Nicholson presided over the meeting, which lasted nearly five hours. Among the towns where disputes exist are Hull, Selby, Leeds, York, and Sheffield. The dispute was considered in all its phases and it was decided to make recommendations to the masters' and mens' unions concerned, with a view to arranging a settlement. A similiar conference between representatives of the Yorkshire Federation of Building Employers and representatives of the Amalgamated Society of Carpenters and Joiners was held at Leeds last Wednesday. Mr. Nicholson, of Leeds, presided, and the other masters present were Messrs. Bray and Marsden (Hull), Charnock (Halifax), Umpleby (Leeds), and Dawson (Huddersfield). The men were represented by Messrs. Wilson (Bolton), Chandley (Manchester), and Hall, Cuttell and Gould (Hull). The point which caused the greatest discussion was the refusal of the men to work with the imported non-society men. The masters state that the unions cannot supply them with sufficient men, and they are, therefore, obliged to use imported men. The disputes are both over the question of wages, while at Halifax the question of rules also enters. It was stated at the conclusion of the conference that the question of wages had been practically agreed to, on condition that the men would return to work with the imported men, and agree to minor local alterations of rules. The conference between master builders and representatives of the Bricklayers', Joiners', and other unions at Hull last Thursday was an abortive one. The meeting was in private, but we hear that both masters and men showed a very determined attitude.

Settlement of the Halifax Joiners' Strike Case.—The application for a perpetual injunction on the whole case of Charnock and others v. Court and others, the previous proceedings of which were reported in our issues of April 12th and 19th and July 26th, was considered at the West Riding Assizes last Tuesday week before Mr. Justice Grantham. Mr. Tindal Atkinson, for the plaintiffs, stated that the case had been settled. The effect of the arrangement which had been made was that the injunction applying to part of the case should be extended to the whole of the case, with certain additions which were to be agreed upon, and which would be handed in to the Associate to be entered up as judgment for a perpetual injunction against the defendants in respect to the matters included in the terms. It was understood that there were to be no costs allowed to either side. Mr. Lawson Walton, for the defendants, said his clients had been anxious to observe the law, and they were wishful to observe the law. Unfortunately there had been an industrial struggle at Halifax, lasting for some time, and although, so far as he could gather, there had been no suggestion of harsh or violent conduct, the line of policy which had been pursued by the union representing the men had, in some cases, no doubt, infringed the law, as defined by a recent decision. Mr. Justice Stirling, in a very careful judgment, gave his grounds for coming to the conclusion that, in one matter, the defendants had brought themselves within the operation of the law, having regard to the recent decision in the House of Lords. Mr. Walton said he felt the justice of that decision, and the defendants had no objection whatever to the order being made perpetual. Their wish was that their conduct should be strictly within legal limits, and, so far as they could do so, they intended to keep within those limits. Mr. Atkinson then applied for judgment for a perpetual injunction on terms agreed upon. His Lordship said he was aware that the case had been sent down by Mr. Justice Stirling, and that a perpetual injunction was sought. He was very glad that counsel had been enabled to arrive at an agreement, because, unquestionably, whilst there was a prospect of peace and goodwill between masters and men, which he hoped would be the outcome of the conference, it would be most unwise to embitter the feeling between them by going into the merits or demerits of that action. The special jury which had been empanelled for the hearing was then relieved from further attendance, and judgment was entered for a perpetual injunction on the terms agreed upon.

Hull Strike Case.—In the Chancery Division on July 21st, the case of Walters v. Green was heard by Mr. Justice Stirling. This was a motion launched on similar lines to those in the case of Charnock v. Court in regard to the Halifax Joiners' strike. It was to restrain defendants from watching or besetting Hull railway station and other places for the purpose of preventing persons engaged by the plaintiffs from working for them. Mr. Upjohn, Q.C., stated the case for the plaintiffs. Mr. Crawford, for the defendants, contended that the action was not properly constituted, and argued that it was against the rules of the Court for the plaintiffs to combine to bring the action. It was arranged that the statement of claim should be amended. At the resumed hearing on August 3rd, Mr. Upjohn stated that the statement of claim had been amended. Mr. Stewart Smith appeared for Hall and Cuttell, two of the defendants, and contended that there was an act of agency shown, or that they had authorised the acts of the other defendants. There were allegations that they were members of the trade union, but there was no evidence as to their responsibility for any of the acts done. Mr. Hartley, in dealing with the case for the other defendants, for whom he appeared, said there was no proof that the imported men would have worked for any of the plaintiffs whose names were on the record, or that the plaintiffs would suffer any damage by their leaving Hull. He submitted that unless the plaintiffs proved that these imported men were to be employed by one or other of the plaintiffs in the action, the plaintiffs could have no right of action against his clients. At the sitting on Wednesday last his lordship delivered his revised judgment. He said that amongst the defendants two were very prominent, Tighe and Emerson. The former, it seemed clear, had been guilty of acts which brought him within the Act. He appeared to have attended the railway station for the purpose of persuading men not to work for the plaintiffs and other members of the Builders' Association. It had been urged that all the defendants must be taken to be parties to the acts complained of, as trade unions were organised bodies, and these men were prominent members or officials. He could not, however, take any such view. Trade unions were lawful bodies, and *prima facie* their officers could not be presumed to have done, or authorised others to do, anything but what trade unions might lawfully do. The acts complained of had been proved against Tighe and Emerson alone, and he granted an injunction against them, similar to that which was granted in "Charnock *v.* Court."

Engineering Notes.

The Tender of Messrs. Dawson and Co., of 9, and 10, Pancras Lane, for the electric lighting of the city has been accepted by the Municipal Council of Port Louis, Mauritius.

The Tender of Messrs. Kerr, Stuart, and Co., of 20, Bucklersbury, E.C., has been accepted by the Wimbledon Urban District Council for the supply of 425 yards of 2ft. gauge tramlines, and six tip wagons.

The New Poplar Electric Lighting Works, the foundation stone of which was laid recently by Mr. Valentine, the chairman of the Electrical Committee of the Board, are to cost about £80,000. The mains will be laid through twenty miles of streets.

The Hambledon Schools, Henley-on-Thames, are being warmed and ventilated by means of Shorland's patent Manchester grates, patent exhaust roof ventilators, and inlet panels, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Horsfall Furnace Syndicate, Limited, intimate that the growth of their business as engineers and contractors for refuse destructors, smokeless boiler furnaces, &c., has necessitated their removal to more commodious premises, which have been secured at No. 5, Greek Street, Leeds, where all communications for the head office should be addressed.

New Electric-Power Works at St. Helen's.—The formal opening of the extensive electric-power works erected by the St. Helen's Corporation, at Boundary Road, St. Helen's, was performed by the mayor (Colonel Pilkington, M.P.) at the beginning of last week. The new generating station has been erected in conjunction with the refuse destructor plant, the contract for the buildings having been placed in the hands of Messrs. John Rothwell and Sons, of St. Helen's.

Port Arthur Improvements.—The first works to be undertaken in the improvement of Port Arthur, for which the Russian Government has assigned a sum of 11,000,000 roubles, will be the construction of two moles and a considerable deepening of the dock, and afterwards of the roadstead and entrance channel. After these operations are completed, storehouses on a large scale are to be erected. The floating plant is to be increased, the existing dry dock lengthened, and the construction of a new one begun. The programme also includes the erection of a hospital, a church, houses for the commander and for the harbour officials, baths, warehouses, barracks, and dwelling houses for medical officers.

Alterations at Waterloo Station.—The extensive alterations which are shortly to be carried out at Waterloo Station will increase from 15½ to 23 acres the area covered by the terminus. Four additional platforms will bring the total to fifteen, and the length of platform facing lines will be increased from 3523 yards to 5737 yards. Seven passenger lines will be laid down in addition to the seventeen now existing. It is also intended to construct a new road of 60ft. in width for vehicular traffic entering and leaving the terminus. The total capital expended will probably amount to about £700,000.

Extension of Electricity Works at Halifax.—Last Wednesday night a special meeting of the Halifax Town Council in committee was held, presided over by the Mayor (Mr. J. T. Simpson), to sanction the application for tenders for the works required in extending the electricity works of the Corporation. Plans were produced by the architect, Mr. W. H. D. Horsfall, for making an addition to the present buildings. The new erection will be 100ft. long by 60ft. broad, and will be practically a doubling of the works. The additions will be capable of holding fully £60,000 worth of machinery, and the estimated cost of the building is about £3,700. The meeting passed unanimously a resolution sanctioning the application for tenders and proceeding with the works.

Bradford Extensions.—At the Bradford Town Hall last Wednesday an enquiry was held into the application to the Local Government Board by the Bradford Corporation for permission to borrow £67,500 under the Public Health Act of 1875 and the Electric Lighting Act of 1882, for the construction of a new Central Fire Station, and electric lighting and works extensions. For the new fire station £11,835 was needed for the purchase of land, and the station itself was to cost £12,390. The Corporation proposed to borrow £37,500 for electricity extensions, powers having already been obtained for £185,194 for electric works purposes. The bulk of the money now proposed to be borrowed would be expended in enlarging and improving the old and the new works; £10,000 would be devoted to new mains, and £1,790 to public lighting. The application was not opposed.

The Annual Meeting of the North of England Institute of Mining Mechanical Engineers was held on August 5th at the Wood Memorial Hall, Newcastle, Mr. W. Armstrong in the chair. The annual report stated that the net increase of membership was thirty-nine. The alterations and additions to the Wood Memorial Hall had been completed for about £2,200, a sum somewhat in excess of the estimated cost. The Finance Committee reported that the total receipts were, from July 1st, 1898, to June 30th, 1899, £3,943 8s. 2d. Of this amount £128 2s. was paid as life compositions in lieu of annual subscriptions, £86 2s. represented subscriptions paid in advance, and there was £1,150 withdrawn from the deposit account at the bankers, leaving £2,579 4s. 2d. as the ordinary income for the year. The ordinary expenditure amounted to £2,210 16s. 7d. There was also paid on account of the alterations to the Wood Memorial Hall, £1,900 12s. 6d., the total payments thus amounting to £4,111 9s. 1d. During the year the sum of £35 14s. had been written off the list of subscriptions and arrears as irrecoverable. The balance sheet showed the capital of the Institute at June 30th, 1899, to be £8,145 15s. 10d., but this did not include either the original value of the Wood Memorial Hall or the amount recently expended in its alteration. The following elections took place:—President, Mr. W. Armstrong; vice-presidents, Messrs. T. Forster Brown, J. L. Hedley, J. H. Merivale, U. W. Parrington, J. G. Weeks, and W. O. Wood. Council: Messrs. H. Aytoun, H. Armstrong, R. Donald Bain, G. Fred. Bell, T. E. Forster, T. E. Jobling, Philip Kirkup, A. C. Kayll, H. Lawrence, H. Louis, J. H. Merivale, H. Palmer, J. Morison, R. E. Ornsby, J. A. Ramsay, F. R. Simpson, J. Simpson, and C. Berkley.

Builders' Notes.

Shifnal Builders' Failure.—A meeting of the creditors of John Bradney, Harry Lloyd, and William Leppington, who carried on business as builders at Shifnal, Wolverhampton, and Albrighton, was held at the Wolverhampton Official Receiver's office on Tuesday last week. The statement of affairs showed liabilities amounting to £3,251 3s. 9d., and assets £2,305 6s. 4d., deficiency £945 17s. 5d. In his observations the Official Receiver stated that the bankrupts, Bradney and Lloyd, commenced business as builders as Bradney and Lloyd at Shifnal in March, 1893, with a joint capital of £500. Mr. Leppington joined them in 1897, putting in £355 of capital, which was borrowed, and was still owing. John Bradney had previously been in partnership in a similar business with Messrs. Skett and Butler as Bradney and Co., at Wolverhampton. The bankrupts' contracts pending include one at Llandrindod Wells, for £7,934; one at Wolverhampton, £1,590; one at Sutton Coldfield, £1,560; and one at Dawley, £350. They attributed their failure to want of capital, losses on contracts, and increase in the price of material and wages. —The debtors were adjudicated bankrupts, and Mr. H. P. Smith was appointed trustee.

Improved Construction of Astragals.—We have received particulars of a useful invention relating to an improved system of construction of astragals and means for securing glass in roofs of structures. Mr. George Francis Wright, glass roofing manufacturer, of 23, Paternoster Square, E.C., is the inventor and patentee. The astragals are made of metal, with one or more grooves or channels to serve for escape of water, and they can be made of any length and straight or curved, according to the desired shape of the roofing. These astragals are bored or drilled at intervals for pegs or screws, by which cover strips can be secured, the strips having longitudinal recesses and projections which not only allow the rain-water to flow down them but the edges to bear upon the glass roofing with or without packing strips which, when fitted, prevent beating rains from passing under them; as a rule, however, should any rain beat under the edges of the cover it will collect in the grooves or channels of the astragals and flow down to the eaves gutter or its equivalent. By this invention a roof of great strength can be erected, particularly if the astragals be braced by ties for distancing them, or be set on cross bearers, and in the case of any glass becoming broken, any section of the cover strips can be temporarily removed to facilitate the fitting in of fresh panes, no putty being necessary.

A Building Dispute at Halifax.—At the West Riding Summer Assizes last Wednesday, before Mr. Bosanquet, Q.C., an injunction was sought by Mr. J. Shoesmith, auctioneer and valuer, of Halifax, to restrain Messrs. T. S. Dodd and Co., Ltd., builders, of Halifax, from building on a plot of land between Rufford Road and Prince's Gate in that town. Mr. Scott Fox, for the plaintiff, said that in 1871 the plaintiff became the owner of two lots of an estate adjoining that concerned in the action. Two of the remaining lots were disposed of to another purchaser, while the rest were not sold until several years after. The conditions of sale were that villas or semi-detached villas should be erected on the estate, all of them in accordance with the building line, and the outbuildings, stables, and conveniences placed on the westerly side of the lot. The plaintiff built a villa at a cost of nearly £4,000, and after living in it about thirteen years leased it to Mr. Standeven. Mr. Standeven erected, with his permission, and without objection from anyone, a billiard-room and a greenhouse in front of the 60ft. building line mentioned in the conditions of sale. When the defendant company obtained possession of the adjoining land about a year ago they contended that the plaintiff had transgressed the conditions of the covenant under which the property was sold, and they had plans passed by the Corporation allowing them to erect houses right up to the plaintiff's residence, known as Stoneygate. The billiard-room was pulled down before the writ for an injunction was served. It was claimed that the putting up of such houses as the defendants proposed, to the extreme limit of the carriage road, would seriously depreciate the value of his property. The case was adjourned for further consideration in London.

Cardiff Builders' Affairs.—A meeting of the creditors of Messrs. Ivens and Anderson, builders, Cardiff, took place, on Wednesday last, at Cardiff, Mr. J. A. Orr (deputy official receiver) presiding. The gross liabilities are returned by debtors at £30,577, but they assert that the value of the assets is £3,281 in excess of their debts. The receiving order was made on the debtors' own petition in consequence of having a judgment obtained against them for £671. The debtors have informed the official receiver that they commenced business in February, 1890, with a capital of £350, which they contributed equally, and from time to time they have added to that amount, and they now state that they have altogether placed between £400 and £500 each into the business. They appear to have carried on building speculation extensively in various parts of the town. The whole of the properties, with the exception of six houses in Connaught Road, have been finished, and the majority are let. There are arrears of ground rent amounting to £475 14s. 1d., and rates amounting to £143 18s. due in respect of these properties. With respect to their failure, the bankrupts state that they would be able to pay all their creditors in full if the properties could be realised. They have kept no books of account showing their trading or financial position, beyond rent-books and wages book. They have no separate liabilities, and their separate assets consist of two bicycles, the furniture in each case being claimed by the respective wives. Mr. C. E. Dovey was appointed trustee with a committee of inspection.

Surveying and Sanitary Notes.

Rawdon Sewage Farm.—The Rawdon District Council have received a letter from the Local Government Board sanctioning the borrowing of £2,830 to pay off a mortgage on the sewage farm.

The tender of the Jarrah Timber and Wood Paving Corporation, of Broad Street House, London, E.C., has been accepted by the St. Pancras Vestry for the supply of hard wood paving for Hampstead Road.

Bierly Improvements.—Last Tuesday week a Local Government Board inquiry was held with reference to the application of the Council for sanction to borrow £551 for works of street improvement, and £225 for the provision of public lamps.

Oldbury Sewage Works.—Mr. H. H. Law, Local Government Board inspector, held an inquiry last Wednesday at Oldbury concerning an application made by the District Council to borrow £1,550 for works of sewage, and also £1,100 for the purchase of land for a refuse tip in connection with the outfall works.

Sewage Works and Disposal at Brotherton.—Mr. Ducat held an inquiry last Thursday into the application by the Pontefract District Council to the Local Government Board for permission to borrow £4,600 for works of sewage and sewage disposal at Brotherton. After the usual evidence, the inquiry closed and the inspector visited the site.

Street Improvements at Hull.—At the Hull Town Hall last week Mr. R. H. Bicknell, M.I.C.E., held an inquiry on behalf of the Local Government Board into the application made by the Hull Corporation for power to borrow £20,900, divided into £15,612 for the purpose of land, repayable in fifty years, and £5,288 for sewerage, paving, and flagging, and the substitution of hard wood in place of granite sets in Kingston Square and Jarratt Street.

Black Smoke Nuisance.—At the City of Manchester police court last Wednesday the following firms were summoned at the instance of the Manchester Corporation Sanitary Department for creating a nuisance by allowing black smoke to escape from the chimneys of their premises, viz.:—Phœbe Lomas, Plymouth Grove, fined 20s. and costs; Henry Briggs, trading as Henry Briggs and Co., Hood Street, 10s. and costs; Edwin Birchenall, trading as Birchenall, Wood, and Company, St. Mary's Road, 60s. and costs; and the London and North-Western Railway Company, Kirkmanshulme Lane, 40s. and costs, and an order of abatement was made against the same company in respect of their premises in Sheffield Street. Mr. Rook, sanitary department, prosecuted in all the cases.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—		
Aug. 18	Chartham, Kent—Repairs, &c., to Asylum	....	W. J. Jennings, 4, St. Margaret's-street, Canterbury.
,, 18	Londonderry—2 Dwelling Houses	J. Barr	R. E. Buchanan, 33, Shipquay-street, Londonderry.
,, 18	Welshpool—Rifle Range	....	F. D. Ward, 38, High-street, Welshpool.
,, 18	Filey—Coastguard Buildings	....	Coastguard Station, Filey.
,, 18	Kirkwall, Orkney, N.B.—Coastguard Buildings	....	Watch Room, Coastguard Station, Kirkwall, N.B.
,, 19	Ashbourne—Union Offices	Guardians	Naylor and Sale, Architects, Iron Gate, Derby.
,, 19	Caerphilly, Wales—Hotel	....	E. N. B. Vaughan, Architect, Cardiff.
,, 19	Cockermouth—Bridge	Rural District Council	J. B. Wilson, Engineer, Court-buildings, Cockermouth.
,, 19	Doncaster—Volunteer Drill Hall	....	J. E. Knight, 33, College-street, Rotherham.
,, 19	Great Yarmouth—Alterations to Premises	Co-operative Society, Limited	Stores, 43, Howard-street, North Yarmouth.
,, 19	Trowbridge—Cellars, Subway, &c	J. H. and H. Blake, Limited	W. H. Stanley, Engineer, Market House-chbrs., Trowbridge.
,, 19	Wickham Market, Suffolk—4 Houses	....	C. D. Castell, Cycle Agent, Wickham Market.
,, 21	Enniskillen—Post Office	Office of Public Works	Post Office, Enniskillen.
,, 21	Leeds—Waiting Room, Office, &c.	Corporation	H. Walker, 8, Upper Fontaine-street, Leeds.
,, 21	Whitehaven—Buildings, Boiler Seatings, &c.	Electric Committee	Borough Engineer, Town Hall, Whitehaven.
,, 21	Workington—Seamen's Bethel	Seamen's Christian Friends Society	W.G. Scott and Co., Architects, Victoria-bldgs., Workington
,, 21	Southend—Technical Schools and Fire Station	Corporation	W. H. Snow, Town Clerk, Southend-on-Sea.
,, 22	Manchester—Underground Convenience	Sanitary Committee	City Surveyor, Town Hall, Manchester.
,, 22	Egremont, Cheshire—Sewer Bricks	Wallasey Urban District Council	Engineer to Council, Public Offices, Egremont.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Aug. 23	Dowlais, Wales—Block of Offices	Iron Company	E. A. Johnson, Architect, Merthyr.
,, 23	Londonderry—Platform Shed	Donegal Railway Company	J. Barton, Engineer, Exchange-buildings, Dundalk.
,, 23	Cardenden, Fife—School	Auchterderran School Board	Lyle and Constable, 3, Hill-street, Edinburgh.
,, 23	Cilgerran, Wales—Bridge	St. Dogwells Rural Distict Council	D. Davies, Clerk, Quay-street, Cardigan.
,, 23	Clayton-le-Moors, Lancs.—13 Houses	Co-operative Society, Limited	J. W. Cooper, Secretary, Clayton-le-Moors.
,, 24	Rotherham—Converting to Shops	General Purposes and Parks Committee	J. Platts, Architect, High-street, Rotherham.
,, 24	Halifax—Refreshment House	....	R. Horsfall and Son, 22A, Commercial-street, Halifax.
,, 24	Salisbury—Addition to Infirmary Wards	Workhouse Guardians	J. Harding and Son, 58, High-street, Salisbury.
,, 25	Shoreham, Sussex—Church and Schools	....	Gordon. Lowther and Gunton, Architects, Finsbury House, Blomfield-street, E.C.
,, 25	London, S W.—Latrine and W.C. Accommodation	Kensington and Chelsea School District	C. Sharpe, 11, Old Queen-Street, S.W.
,, 25	London, W.—Repairs and Painting, &c., to Baths, &c.	St. Pancras Vestry	C. H. F. Barrett, Clerk, Vestry Hall, Pancras-road, N.W.
,, 26	Luton—Police Station	Bedfordshire County Council	County Surveyor, Shire Hall, Bedford.
,, 28	Godalming—Municipal Buildings	Town Council	Lanchester, Stewart and Rickards, 1, Vernon-place, W.C.
,, 28	Chesterfield—Schools and Swimming Bath	School Board	Tiltman and Jackson, 29, Knifesmith-gate, Chesterfield.
,, 30	Enfield—Underground Convenience	Urban District Council	R. Collins, Surveyor, Court House, Enfield.
,, 30	Malvern—Sanatorium	Urban District Council	Surveyor, Council Offices, Malvern.
,, 31	Sunderland—Workmen's Dwellings	Corporation	Borough Surveyor, Town Hall, Sunderland.
Sept. 1	Malmö, Sweden—Electric Works	....	Clerk, Gasworks, Malmö.
,, 2	Windsor—Sanitary Convenience	Town Council	Borough Surveyor, Helena-road, Windsor.
,, 4	Hailsham, Sussex—Foundations for Asylum	East Sussex Asylum Visiting Committee	G. T. Hine, 35, Parliament-street, Westminster, S.W.
,, 5	Enfield—Block of Schools	School Board	G. E. T. Laurence, 181, Queen Victoria-street, E.C.
,, 8	Cromarty, N.B.—Coastguard Buildings	Admiralty	Director of Works, 21, Northumberland-avenue, W.C.
,, 9	Rhyl—Intermediate School	....	F. H. Shayler, Architect, Welshpool.
,, 12	Croydon—Superstructure of Asylum	Town Council	Borough Engineer, Town Hall, Croydon.
,, 30	Hallwill, Devon—Cottage Hospital	....	C. F. A. Voysey, 6, Carlton Hill, N.W.
	ENGINEERING—		
Aug. 18	Melton, Suffolk—Bacteria Beds	County Asylum Visiting Committee	A. T. Cobbold, County Hall, Ipswich.
,, 18	Motherwell, Scotland—Electric Lighting	Commissioners	Prof. A. B. W. Kennedy, 17, Victoria-st., Westminster, S.W.
,, 19	Adlington, Lancs.—Sludge Works	Urban District Council	T. S. McCallum, 52, Corporation-street, Manchester.
,, 19	Bury, Lancs.—Lattice Girder Bridge	Waterworks Committee	J. Cartwright, Corporation Offices, Bank-street, Bury.
,, 19	Glasgow—Steamboat Slip	Corporation	J. M. Gale, 45, John-street, Glasgow.
,, 21	Glasgow—Switchboards, Electricity Meters, &c.	Corporation	W. A. Chamen, 75, Waterloo-street, Glasgow.
,, 21	Blackpool—Electrical Equipment of Tramcars	Corporation	R. C. Quin, Corporation Electricity Works, Blackpool.
,, 22	Colwyn Bay—Electric Plant	Urban District Council	W. Jones, Town Surveyor, Council Offices, Colwyn Bay.
,, 22	Sophia, Bulgaria—Passenger Cars, &c.	State Railways	Commercial Department, Foreign Office, S.W.
,, 23	Christiania—Railway Trucks	Norwegian State Railways	Commercial Department, Foreign Office, S.W.
,, 23	Berkhampstead—Bacterial Filter Beds	Joint Sewerage Committee	J. Lemon, 9, Victoria-street, Westminster.
,, 23	Dundee—Tramway Plant	Town Council	W. H. Tittensor, Engineer, Dudhope-crescent-rd., Dundee.
,, 24	Milton—Water Tower, Steel and Cast-iron Works, &c.	West Hampshire Waterworks	R. St. G. Moore. 17, Victoria-street, Westminster.
,, 24	Belfast—Reservoirs	Water Commissioners	B. Hamilton, Water Office, Belfast.
,, 24	Plymouth—Outfall Sewer, &c.	Corporation	J. Mansergh, 5, Victoria-street, Westminster, S.W.
,, 28	Willesborough, Kent—Water Supply Works	East Ashford Rural District Council	Bailey-Denton, Son and Lawford, 9, Bridge-st., Westminster.
,, 28	Perth—Electric Plant	Lord Provost and Commissioners	W. C. C. Hawtayne, 9, Queen-street-place, E.C.
,, 28	Westbury-upon-Trym—Sewage Disposal Works	Barton Regis Rural District Council	A. P. I. Cotterell, 7, Baldwin-street, Bristol.
,, 30	Westbury—Reservoir, &c.	Rural District Council	W. H. Stanley, Engineer, Market House-chbs., Trowbridge.
,, 30	Enfield—Lathe, Shaping Machine, &c.	Urban District Council	T. W. Scott, Clerk, Court House, Enfield.
,, 30	Sophia, Bulgaria—Locomotives	State Railways	Commercial Department, Foreign Office, S.W.
,, 31	Newcastle-upon-Tyne—Boiler Plant	New Tramways Committee	C. Hopkinson, 29, Princess-street, Manchester.
,, 31	London, S.W.—Crane, Electric Lighting, &c.	St. Mary's Vestry, Battersea	Vestry Clerk, Municipal-buildings, Lavender-hill, S.W.
Sept. 2	Carmarthen—Reservoir	Corporation	Borough Surveyor, Carmarthen.
,, 4	Belfast—Widening Dock	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Harbour Office, Belfast.
,, 9	East Ham—Electric Lighting, &c.	Urban District Council	W. C. Ullmann, The Limes, White Post lane, East Ham.
,, 11	Preston—Bridge	Lancashire County Council	W. H. Radford, County Bridgemaster, County Offices, Preston
,, 13	Ilford—Railways	Great Eastern Railway Co.	Engineer, Liverpool-street Station, E.C.
Nov. 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
	IRON AND STEEL—		
Aug. 19	Abercynon, Wales—Steel Work for Bridge	Glamorgan County Council	T. M. Franklen, Clerk, County Offices, Westgate-st., Cardiff.
,, 22	Bury, Lancs.—Cast-iron Pipes	Waterworks Committee	J. Cartwright, Borough Engineer, Bank-street, Bury.
,, 22	Darwen, Lancs.—Steel Rails, &c.	Corporation	Borough Electrical Engineer, Town Hall, Darwen.
,, 23	Southport—Manhole Covers and Pipes	Corporation	R. P. Hirst, Borough Surveyor, Southport.
,, 23	Bradford—Various Stoves	Gas and Electricity Committee	F. Stevens, Town Clerk, Town Hall, Bradford.
,, 26	Bradford—Steel Girder Rails, &c.	Corporation	J. H. Cox, City Engineer, Town Hall, Bradford.
,, 30	Westbury, Wilts.—Cast-iron Pipes, &c.	Rural District Council	W. H. Stanley, Engineer, Market House-chbrs., Trowbridge.
	PAINTING AND PLUMBING—		
Aug. 19	Wolverhampton—Painters' Work	Lighting Committee	J. W. Bradley, Engineer, Town Hall, Wolverhampton.
,, 20	Portsmouth—Decorating Room, &c., at Town Hall	Corporation	A. Hellard, Town Clerk, Town Hall, Portsmouth.
,, 26	Stanley, Durham—Decorating and Painting Chapel	....	W. Forster, Architect, Clifford-road, Stanley, R.S.O.
,, 31	Ulverston—Painting at Cemetery	Urban District Council	J. Atkinson, Registrar of Cemetery, Theatre-st., Ulverston.
	ROADS—		
Aug. 18	Melton, Suffolk—Roads, &c.	County Asylum Visiting Committee	A. J. Wood, 22, Surrey-street, Strand, W.C.
,, 19	Dronfield—Asphalting Yards, &c.	School Board	W. J. Siddall, Architect, Hope-terrace, Dronfield.
,, 19	Colchester—Hire of Steam Roller	Lexden and Winstree R.D.C.	J. Ennals, Surveyor, Copford, near Colchester.
,, 21	Stevenage, Herts—Granite	Urban District Council	W. O. Times, Clerk, Council Offices, Stevenage.
,, 22	Cork—Ballast	Harbour Commissioners	W. Donegan, Secretary, Harbour Office, Cork.
,, 22	Portsmouth—Paving, Gravel, &c.	Corporation	A. Hellard, Town Clerk, Town Hall, Portsmouth.
,, 22	Darwen, Lancs.—Granite Setts, &c.	Corporation	Borough Engineer, Town Hall, Darwen.
,, 23	Royston, Herts—Kerbing, &c.	Herefordshire County Council	County Surveyor, 41, Parliament-street, Westminster, S.W.
,, 25	Blandford—Road Works	....	C. Hunt, Architect, Blandford.
,, 25	Scarborough—Hire of Steam Roller	Rural District Council	J. A. Iveson, 155, Prospect-road, Scarborough.
,, 26	Bradford—Granite Setts, and Wood Blocks	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.
,, 26	New Malden—Materials, &c.	Urban District Council	T. V. H. Davison, Public Offices, Cambridge-rd, New Malden.
,, 29	Stanley, Durham—Street Works	Urban District Council	J. Routledge, Surveyor, Council Offices, Stanley.
Sept. 6	Sutton, Surrey—Road Works	Urban District Council	C. C. Smith, Surveyor, Council Offices, Public Hall, Sutton.
	SANITARY—		
Aug. 21	Leigh-on-Sea—Town Sewerage Works	Urban District Council	Bailey-Denton, Son & Lawford, Palace-chbrs., Westminster.
,, 23	Congleton—Cutting Main Drain, &c.	Common Land Trustees	C. R. Hall, 1, West-street, Congleton.
,, 24	Plymouth—Sewerage Works	Corporation	J. Mansergh, 5, Victoria-street, Westminster.
,, 29	Epsom—Sewerage Works	Rural District Council	Beesley, Son, and Nichols, 11, Victoria-street, Westminster.
,, 31	Penmaenmawr, Wales—Sewering	Urban District Council	E. Worrall, Surveyor, Council Offices, Penmaenmawr.
Sept. 4	Lyme Regis, Dorset—Sewers	Town Council	Town Clerk, Town Hall, Lyme Regis.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Sept. 1	Otley—Isolation Hospital	£30, £15	C. V. Newstead, Clerk, Wharfedale Union Joint Hospitals Committee, Union Offices, Boroughgate, Otley.
,, 4	Northfleet—Schools	£15 15s.	Clerk to School Board, 49, Windmill-street, Gravesend.
,, 15	Workington—Town Hall	£40, £20, £10	W. L. Eaglesfield, Surveyor, Town Hall, Workington.
,, 15	Dumfries—Public Library	....	J. Grierson, Town Clerk, Dumfries.
,, 16	Norwich—Bank	£52 10s., £21, £10 10s.	Secretary, Norfolk and Norwich Savings Bank, C.E.Y.M.S. Rooms, Norwich.
,, 30	Tunbridge Wells—Designs in Tunbridge Ware	£3 3s., £2 2s., £1 1s.	Technical Education Committee.
No date.	Leeds—Masonic Hall Buildings	£50, £20, £10	C. Scriven, 9, Albion-street, Leeds.

Property and Land Sales.

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SALE DAYS for the Year 1899.

Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, Sept. 21
Thursday, Oct. 12
Thursday, Oct. 26
Thursday, Nov. 16
Thursday, Nov. 23
Thursday, Dec. 7
Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

MOTE PARK, MAIDSTONE.

MESSRS. SEYMOUR and WARING (in conjunction with Messrs. R. WATERMAN and SONS) are favoured with instructions from the Council of the Royal Agricultural Society of England to SELL by AUCTION, on AUGUST 21st and 22nd, 1899, the whole of the SHOW YARD ERECTIONS used at the Royal Agricultural Show, exceeding 1,000,000ft. of Timber, 10,000 Railway Sleepers, 400 Buck Gates, Quantity Iron Tanks, and other effects. Sale to commence at 11 a.m. precisely each day.

Catalogues may be obtained of Messrs. SEYMOUR and WARING, Auctioneers, 46, Earl-street, Maidstone; Messrs. R. WATERMAN and SONS, Auctioneers, No. 20, Week-street, Maidstone; and of Mr. R. S. BURGESS, Show Yard, Mote Park, Maidstone.

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The Directors are prepared to receive PROPOSALS for the SALE or LETTING of SITES for Private Houses on this property, which is being developed by the Company as a high-class Residential Estate.

The land lies high with a deep gravel subsoil, and has a frontage of over half a mile to Wimbledon Common, and is well timbered.

The Estate, which until lately was the residence of the late Sir Henry Peek, is situated in the best part of this much sought after suburb, and commands extensive views over the Common to the Surrey Hills, and the excellent service of trains makes it peculiarly convenient to gentlemen whose pursuits command their presence in London.

Plans and further particulars may be had by applying to the SECRETARY, at the Estate Office, Parkside, Wimbledon, or to the Surveyor, GEORGE HUBBARD, F.R.I.B.A., 85, Gresham-street, E.C.

WEYBRIDGE, within few minutes of station, overlooking river, beautifully situated. FREEHOLD PLOTS, suitable for good residences, will be offered by AUCTION, on the ESTATE on THURSDAY, 17th AUGUST, at TWO p.m. Free deeds, instalments (if desired).

For particulars, plans, and tickets, apply to THE NATIONAL LAND CORPORATION, Limited, No. 18, Adam-street, Adelphi, W.C.; or to the AUCTIONEER, F. G. WHEATLEY, 263, Strand, W.C.

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MAPLE and COMPANY have received instructions to SELL by AUCTION, at the Bay Hotel, Seaford, on THURSDAY, AUGUST 17th, 1899, at TWO o'clock precisely, the THIRD PORTION of the SUTTON ESTATE, comprising about 100 exceedingly desirable Plots of FREEHOLD BUILDING LAND, suitable for the erection of houses at a cost of from £600 to £800, fronting the Eastbourne and Southdowne roads and Sutton-avenue, and commanding sea views; overlooking the Seaford Golf Links and about five minutes from the railway station and esplanade. Terms of payment, ten per cent. deposit, balance in nine half-yearly instalments, with interest at four per cent. and free conveyance.

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Offers may be sent to Mr. H. PORTER, Surveyor, 16, Russell-square, W.C., or to the undersigned, W. ARNOLD HEPBURN, Clerk to the Leathersellers' Company, Leathersellers' Hall, St. Helen's-place, E.C.

HARROW RECREATION GROUND.—FOR SALE, by Private Treaty, the valuable FREEHOLD FRONTAGE of the above for Building Purposes, comprising about 680ft., varying from 150ft. to 125ft. in depth. Within a few minutes' walk of three lines of railways. Faces the main road from Harrow to Pinner, which is made up in every way and taken over by the local authorities, the rear overlooking the recreation ground of 26 acres.—Apply to Messrs. W. B. WALKER, High-street; A. L. LLOYD, Headstone-road; or F. W. STEVENS, High-street, Harrow.

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ANSELL and MALLOWS, Architectural Draughtsmen and Quantity Surveyors, 21, Buckingham-street, Strand, W.C.

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PLANS, Applications, &c., Prepared by an experienced Architect. Advice given in Building Act questions, and disputes settled.—Address, "Architect," 17, Algarve Road, Earlsfield, S.W. 3

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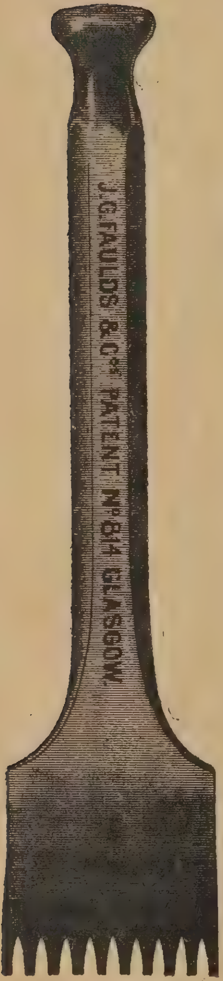
TO MASTER BUILDERS, CONTRACTORS, AND ALL ENGAGED IN STONE-CUTTING.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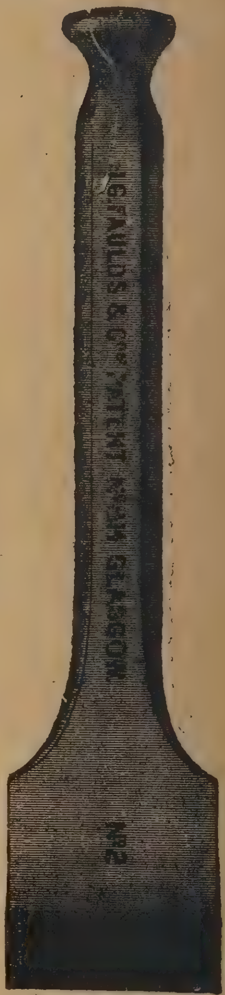
2" Drove, showing Cutter in Slot.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Reversible Cutter, with "Drove" Edge out.

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Any person manufacturing these Tools will be liable to prosecution for infringement of Patent.

THESE IMPROVED TOOLS for stone-dressing combine lightness with great efficiency in working, with perfect freedom from the annoyance of bad sharpening, tempering, or other defects. They possess *double* the advantages of the AMERICAN TOOTHED TOOL, by having, in a handy and convenient form, double teeth, or a chisel and "tooling drove" combined, the efficiency and economy of which a PRACTICAL MAN WILL SETTLE IN A FEW MINUTES.

The outstanding merits of the MULTIPLEX STONE-CUTTER are its simplicity and economy. They are simple in construction. The Handles are made with a slot (see below) in which the Cutter is inserted, and the Tool is complete. There are no screws or joints in the Handle to give trouble in fixing or removing the Cutter. They are economical. By the use of these Tools a great saving is effected, all the loss of time, trouble, and expense incurred in getting the ordinary tools sharpened being avoided.

Owing to the handiness and durability of these Tools they are in constant use throughout the whole of the United Kingdom.

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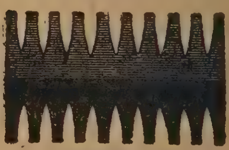

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N.B.—Like every other useful invention, this is imitated, but none are genuine except

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS

August 23, 1899.
No. CCXXXVII.

Effingham House,
Arundel Street,
Strand, W.C.

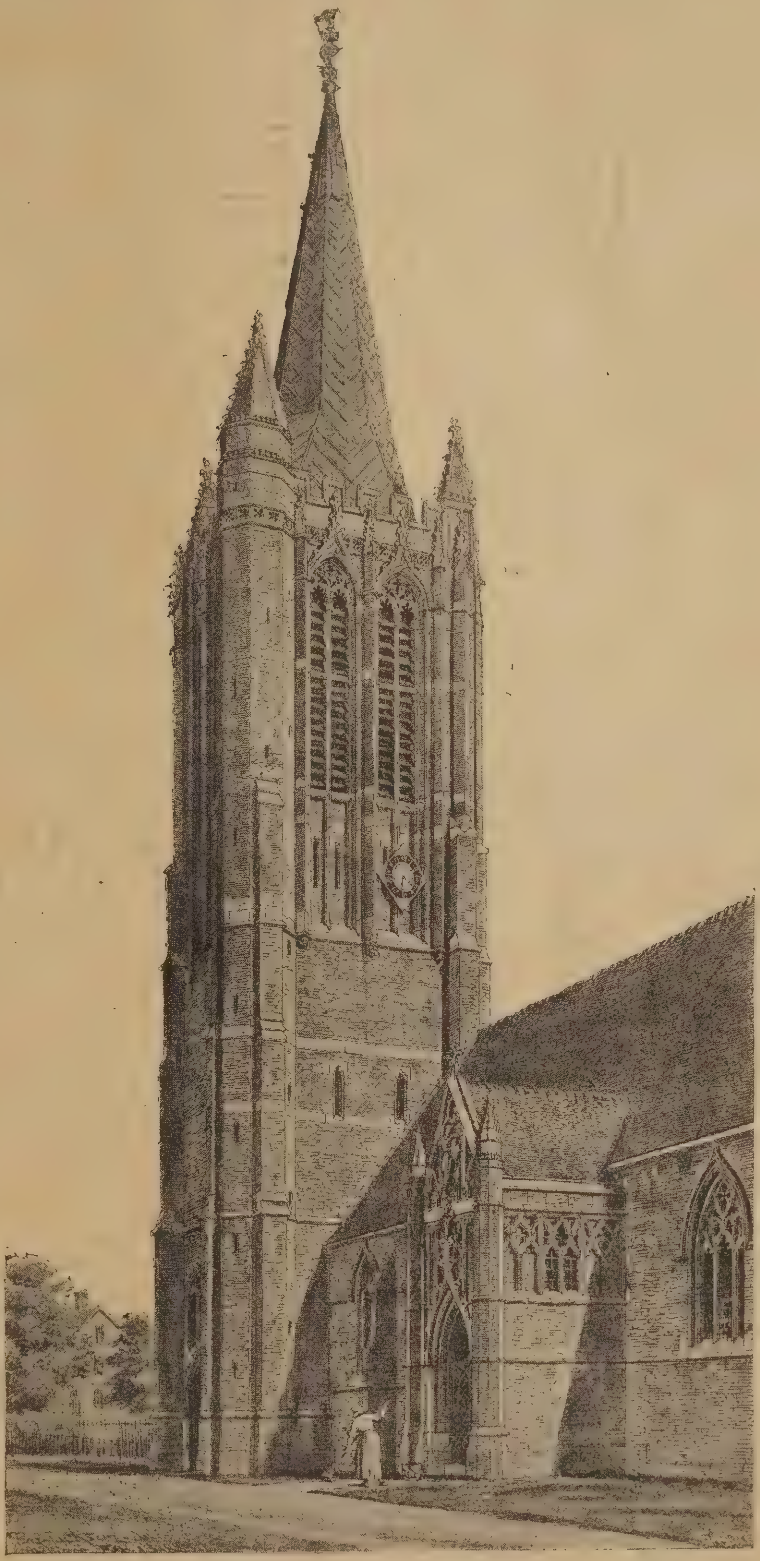
An Architectural Causerie.

A New Use for Town-House Roofs. A most interesting set of experiments has been brought to a successful issue at Paris, and may possibly prove suggestive to British architects and house-owners. It is no less than an attempt to realise the delights of the famous hanging gardens of Babylon. Of course, in most Oriental countries, where the roofs are flat, more or less serious efforts at floral cultivation are attempted on those not very elevated crowns of buildings. This is partly to afford distraction to the ladies, and partly to act as an additional screen. Well, the idea occurred to a certain M. Tabary, who owns large houses in the Rue des Valois and the Avenue Suffren, Paris, that the roofs of his tall and crowded edifices could be turned into rivals of the Luxembourg and Tuilerie gardens, and far more convenient, as instead of a long trudge by dusty, noisy streets, a mere going up aloft by means of passenger lifts would bring the tenants to bosky groves and glowing floral borders. It must be said that modest gardens amidst the chimney pots are not new things for Parisians; the citizens of gay Lutetia have ever been prone to dispute the region of tiles and smoke stacks with the reprobate grimalkin and impudent sparrow. But now, as in pre-revolutionary days, the efforts are generally restricted to a few flower boxes and pots, arranged close to parapets, and clustered round diminutive arbours. M. Tabary's venture differs from others mainly owing to its magnitude and thoroughness. On the top of his many storied houses he has veritable gardens, with not only beds of flowers, but small groves of flowering shrubs, fruit trees, vines, &c., fountains and big arbours. Some of the trees are over 12ft. high.

Let us consider the Rue des Valois example. Here we find that the available space amounts to little more than 600 square feet. The roof has been levelled, the foundation, as it were, consisting of iron girders, closely interlaced; over this is a layer of cement, then a layer of fine sand, upon which are placed large sheets of absorbent mill-board, heavily impregnated with creosote and other preservative and waterproofing substances. On this is another layer of sand, 4in. deep; now comes the rich garden mould, which is 2ft. deep. Of course the weight of all this is considerable, but then Paris tenement houses of the better class are most substantially built, having deep foundations, and thick walls, both outside and partition. The Tabary gardens in the Avenue Suffren are a still more formidable undertaking, as they extend over three big houses. The parapets are somewhat high, and the drainage is managed by giving the gardens a slight incline outwards, all water finding its way to the gutters and water-pipes covered with gratings. The gardens are laid out in most approved style with flower beds, gravelled paths, sparkling fountain, and trellised arbours. Not only are there fine magnolias in full bloom, but peach trees bearing fruit, and flourishing vines, promising abundant crops. In both the instances dealt with the houses are tall and on excellent sites, so that splendid panoramic views can be enjoyed by the happy tenants, who, moreover, are brought up to the central arbours in passenger lifts.

Whether such extensive gardening operations so high up in the air are possible, advisable, or needful, in London and our other crowded cities is a question open to discussion. No doubt few of our modern bee-hive mansions, or "flats," could bear such an experiment, though a roof terrace, with floral boxes, is certainly easy of attainment, both for the highly rented mansions and the popular barracks, which are known, for some unexplained reason, as "model dwellings." One thing is quite certain, during the recent heat wave which prostrated the metropolis such roof gardens would have been a boon, and would have brought blessings on the heads of the architects who had placed such retreats within the reach of the scorched, gasping Londoners.

G. C. R.



DESIGN FOR TOWER TO ST. JOHN'S CHURCH, WIMBLEDON. T. G. JACKSON, R.A., ARCHITECT

St. John's Church, Wimbledon. The above illustration is from a design made some years ago for a tower to St. John's Church, which Mr. T. G. Jackson, R.A., erected at Wimbledon. The tower has never been carried out for want of funds.

The Architect's Note Book.

EVERY business man is fully alive to the value of a properly kept and regularly entered diary, containing exact details of all the occurrences of his business life, the time occupied upon each detail, and the out-of-pocket expenses incurred. But the architect in general practice needs something more than this. As with the doctor, so with him, much of that of which most accurate record is necessary occurs outside the four walls of his office, and must be noted at once if it is to be remembered and acted upon with certainty; while, if he be a man of method, his diary will be entered up but once each day, just before leaving office. A pocket note book thus becomes an essential, and if the habit of carrying one be once adopted, it is found available for a multiplicity of uses, and the further useful habit of consulting it when diarising will often lead to matters being attended to which otherwise might, in the multiplicity of affairs, have been overlooked. Its usefulness will generally, however, be apparent much earlier in the day than this. When the letters are opened in the morning, and the plan of work for the day is decided, the note book is handy for entries of appointments, times of trains, and of works to be visited, and under each of these heads further entries will serve as reminders of the various points to be discussed at interviews, nearest routes for journeys, and details needing adjustment or consideration on the various buildings in progress. Then during an interview, or on the work itself, notes can frequently be made which are of the highest value—answers to doubts or queries for solution when the office is reached again. Notes of this sort, too, are not only useful in the assistance they afford to the successful "running of an office," but have a high legal value also in the quite possible event of the note taker having to give evidence on oath; and, having this in view, it is well that the notes should be made in some more permanent medium than lead pencil. Liquid ink is generally out of the question, but a blue copying-ink pencil will serve the purpose admirably, and can easily be carried, with other pencils, scales, and rule, in the rule-pocket which many architects wear inside their coats.

The habit of carrying and using such a note-book is not one which can be adopted and laid down at will. Granted its expediency, it needs to be cultivated, and should never be abandoned; and a great aid to its early adoption is found in its value to the youthful pupil or assistant as much as to the active practitioner, particularly when sent away from the office with messages or upon inspections. Its importance is recognised in the demand, upon the part of the R.I.B.A. Examination Committee, for the production of evidence of the actual inspection and supervision of works in progress by candidates for the Final Examination for Associateship, such evidence being exceedingly difficult to compile and produce if a regular system of note-taking has been adopted. Some few short-sighted principals have been known to discourage the keeping of such notes by their pupils; but discouragement of this sort is fortunately confined to the few who are still possessed of the old idea that a pupil ought not to be allowed to know too much—ought not, in fact, to be allowed to pick up knowledge which he has paid a premium to be taught. An enlightened man uses a note-book himself, and acknowledges the value, both to himself and them, of similar books being regularly kept, always accessible and in the pockets of all in his employ.

G. A. T. M.

On Reflection.

The Vandyck Celebration.

DURING the past few days the hub of the artistic universe has been at Antwerp. Three hundred years ago Antony Vandyck was born within its precincts, and in paying honour to his memory Antwerp has been honouring itself, and exhibiting to the world a striking example of that combination of artistic and civic enthusiasm to which its burgomaster referred with justifiable pride at the opening of the tercentenary celebration. For Englishmen this celebration has an interest only second to that which it has for the Flemings themselves. For not only have a large number of the pictures now being exhibited at Antwerp been culled from English collections, but it may fairly be claimed that the great portrait painter was himself half an Englishman. As court painter to Charles I. he lived for many years in this country, he married an English wife and was buried on English soil. Then, again, while we share with all the world the purely artistic interest which attaches to Vandyck's pictures, they have for us a peculiar attractiveness by reason of their association with one of the most interesting and turbulent periods of English history. It would be an interesting inquiry for the student of history how far the glamour of romantic interest which has surrounded the House of Stuart is due to the fact that the charming and graceful characteristics of the members of that house and their aristocratic supporters have been perpetuated in Vandyck's wonderful gallery of portraits. However that may be, there can be no doubt about the supreme place which Vandyck holds amongst the portrait painters of the world, and it is therefore satisfactory to know that as the Rembrandt Exhibition at Amsterdam last year was followed by a winter exhibition of Rembrandt's works at the Royal Academy, so we are to have next winter a Royal Academy Exhibition specially devoted to the works of Vandyck.

A Word about Pageants.

ONE feature of the Vandyck celebrations must have afforded matter for astonishment to most English people who witnessed it or read about it. Four times during the period of the celebrations there passed through the streets of Antwerp a "cortège artistique," so elaborate, interesting and beautiful as to call forth expressions of practically unanimous admiration from those who saw it. It represented with wonderful completeness the most notable art epochs of the world from the Egyptian and Assyrian down to the age of Vandyck. On its preparation the municipality of Antwerp spent £4,000, and eminent artists and craftsmen devoted many months of ungrudging labour to the perfecting of its details. Such a thing would seem to be an impossibility in this country. We have not the genius for outdoor pageantry; we are too literal, too unimaginative, too undramatic. Our street processions are occasionally impressive, more often simply grotesque, but never by any chance artistic. Even the great Jubilee procession of 1897 was a failure from a pictorial point of view, and as for the annual effort of the Corporation of the City of London on November 9th, that is a spectacle that might well move the artistic soul to tears, were it not so utterly ludicrous. It is true that there has been seen within the past few months an artistic experiment which suggests that even in this country a street procession, which should be neither offensive nor ludicrous, might be carried out if only the right people could be engaged in its preparation. The recent revival of the masque by the Art Workers' Guild, revealed the existence of latent possibilities in this direction that had not, perhaps, hitherto been suspected. If the Art Workers, having successfully revived the old English masque, are sighing for more worlds to conquer, we would suggest that they should devote their energies to the preparation of an outdoor pageant which, in celebration of some worthy occasion, should afford many thousands of Londoners the same kind of artistic enjoyment and stimulus as a select few gathered in the Guildhall derived from that beautiful stage picture, the Procession of Fair Cities. We are a prosaic and a practical people, and we do not want our omnibuses and cabs to be often displaced by dolphins, cupids, and symbolical cars; but if it should happen that with the growth of intelligence and artistic sensibility the Lord Mayor's Show should die of ridicule, it would not be a bad thing if its place might be filled by an annual pageant (say on St. George's day) in which poets and musicians, art workers and craftsmen, might join hands to attain a worthy artistic object such as has just been achieved in Antwerp.

Spoiling the Royal Exchange Frescoes.

FRESCOES and advertisements jumbled together do not, as a rule, look very artistic. On the inner walls of the Royal Exchange they certainly look very much out of place. The advertisements are much more numerous than the paintings, and the Royal Exchange bids fair to become a mere advertisers' exhibition. Fortunately the feeling in the City is against the growth of advertisements, and the Gresham Committee state that no others are to be admitted, and whenever presentations of paintings are made the panel required will always be cleared of the offending advertisements. That is some consolation, but it does not do away with the present incongruity of gilded advertisement letters hanging on the same walls with beautiful works of art. Such paintings as Mr. J. Seymour Lucas's "William the Conqueror granting a charter to the Citizens of London," the picture of King Charles I. demanding the five members at the Guildhall, and the picture of Queen Elizabeth on her white palfrey, cannot be seen to advantage in proximity with coloured posters of ships in mid-ocean, insurance companies' advertisements, and the like.

"A Labour of Love."

AGHADA is in Ireland; and it must be a very charming spot, both by reason of the natural beauty of its surroundings and the Arcadian simplicity of its inhabitants. The Presbyterians of the town (or is it a village?) have just built themselves a new iron church. The correspondent of the "Belfast News Letter," which records the important event, waxes eloquent over the beauty of its situation: "It overlooks the harbour, and the music of the waters steals in through the open windows. Close at hand are the woods of Rostellan, and away in the distance undulating hills and sunny inlets blend in perfect harmony." And when he comes to describe the building itself our scribe's enthusiasm is unabated, though his language is more prosaic—and less grammatical: "There is (*sic*) a convenient vestry, a platform, a reading desk, a stove, and comfortable seats for the worshippers, all finished in a style which shows that with the contractors it was a labour of love." There is something delightfully primitive in this expenditure of enthusiasm on a corrugated iron conventicle and its simple furniture. In some such terms, one may suppose, the natives of Fiji or Tahiti might have expressed their admiration for the first rude chapel erected in their midst by pioneer missionaries. Happy Aghada, where all the geese are swans, and the contractors work for love.

DINING HALL, TRINITY COLLEGE, DUBLIN.

THIS is a very interesting old building of the last century, built from the design of a German named Richard Cassels, who settled in Ireland, and who is also responsible for several buildings of a similar type and style both in and around Dublin.

It may be of interest to mention that, on the site of the present hall, there previously existed a building which was designed as a dining-hall, but owing to the foundations having sagged to a dangerous extent, it was pulled down in 1755, very soon after its erection. This first building was carried out under the superintendence of the college bricklayer, whose name is peculiarly appropriate to his calling. He was a Mr. Plumber.

After the demolition Cassel's advice was sought by the college authorities, and the present building was erected from his plans. It is stated in the college books that although he died before its completion, his design was carefully carried out.

The building stands detached in a fine open square, presenting a front nearly 80ft. wide, facing south. Its detail is peculiar in character; the mouldings generally of the stonework are bold and heavy, the angular pediment is supported by four Ionic pilasters of granite peculiarly built up in courses, the caps and bases are of Portland stone. The main entrance is reached by a flight of ten steps, rising to a height of five feet above the ground level. The dining-hall proper is approached through a spacious ante-hall or vestibule. It is a fine, well-proportioned room, measuring 84ft. long, 35ft. in width, and 35ft. high; it is panelled in oak to a height of 12ft. round the four walls, with a plain but effective capping cornice.

The hall is abundantly lighted by four windows on the east side over the panelling, and in the north end is a well designed Venetian window; in the centre of the west wall is a very interesting fireplace in stone with an overmantel in oak richly carved. There is a well arranged flight of stone stairs leading to the Fellows Club or common room over the ante-hall, and some good examples of bent iron work are here to be found; an example is given in the illustration on this page. A series of very fine full-length portraits of some of the many distinguished graduates of the University, including Chief Justice Downes, Lord Avanmore, Gratton, Flood, and Prince Frederick, father of George III., occupy all the available wall space of the dining-hall. The ceiling is covered 10ft. all round the plaster work, and the wood work, as well as the detail generally of the interior, is very pleasing and effective. The building as now existing was commenced about 1758 and finished in 1761.

DUBLIN FOR THE ARCHITECTURAL STUDENT.

AN ADDRESS TO STUDENTS.

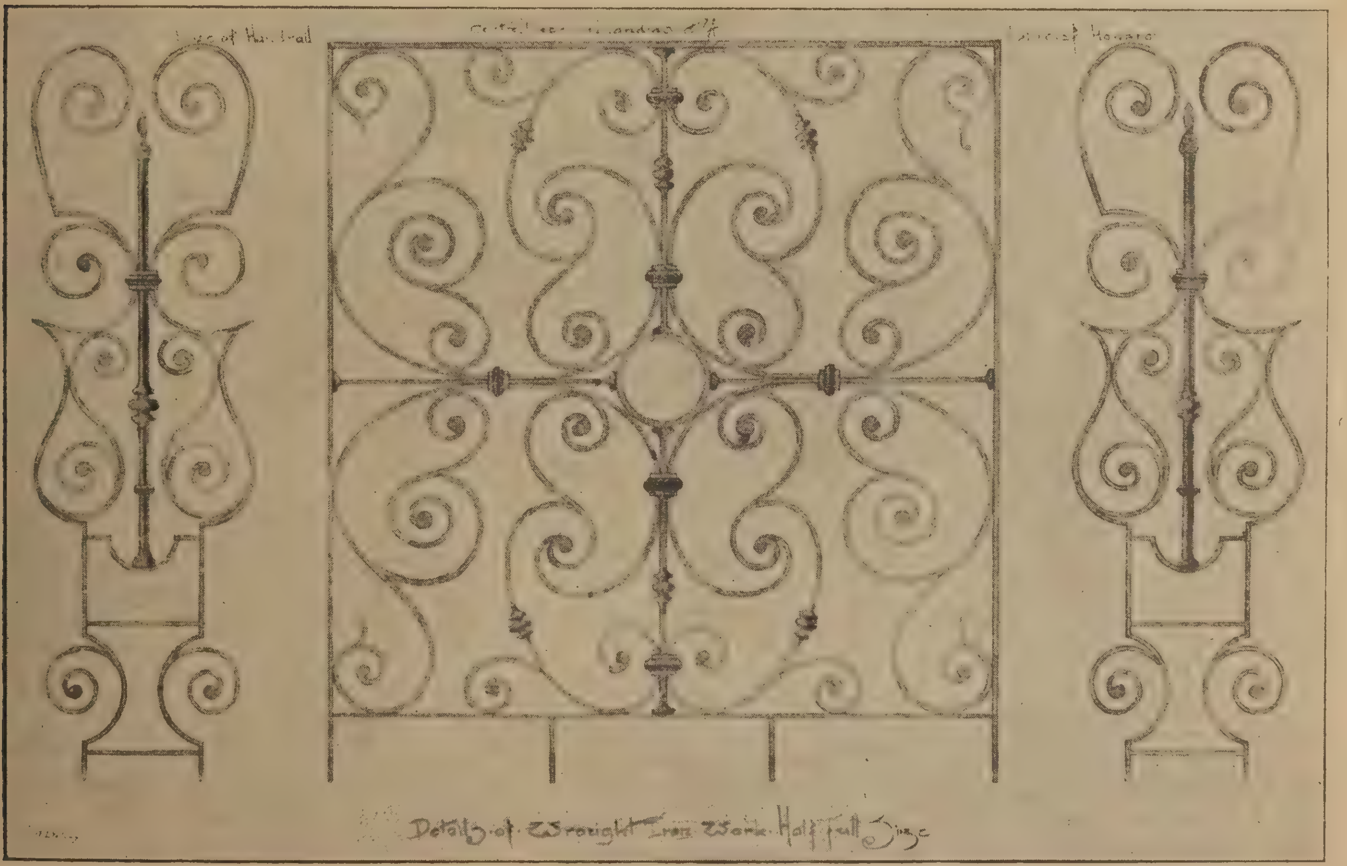
By THOMAS DREW, F.R.I.B.A., Pres., R.I.A.I.

ENOUGH has been said—and more than enough—of the disabilities and grievances of those whose architectural lot is cast in this somewhat isolated old provincial capital. There is a great deal to be said on the other side. Is it nothing to live in a pleasant city with a good climate and a beautiful country environing it, in a city of 350,000 people, too large to be provincial in a vulgar sense, not too large to be sociable; abounding in companionship of many who are following literary, scientific, artistic, musical or antiquarian pursuits; with sympathetic welcome for every man whose tastes may draw him into congenial bye-paths? Has it not fine libraries and museums, and some specially unique ones, ancient records, MSS., &c., &c., all lying open and free to all comers, and for the most part on Sundays as on week-days? To mould and shape the wild, untutored architect-man through a liberal education, and to inspire intellectual instincts in him, there is no influence wanting. That is something.

And when it comes to architecture proper, and comparison is to be made with some other cities of the Empire, is Dublin despicable? For the architect, is there not something in the luxury of living in an old historic city, having many dignified and respectable monuments—a local metropolitan city of past times with much picturesqueness of architectural effects, spontaneous, unstudied, of unconscious evolution, as it could not be in any brand new city? Think of Birmingham, Leeds, Bradford, Wolverhampton, even Manchester or our northern Irish manufacturing City of Belfast; would they be as good as this? What is there in such cities to inspire an architectural student with one spark of enthusiasm as he comes and goes in their streets?

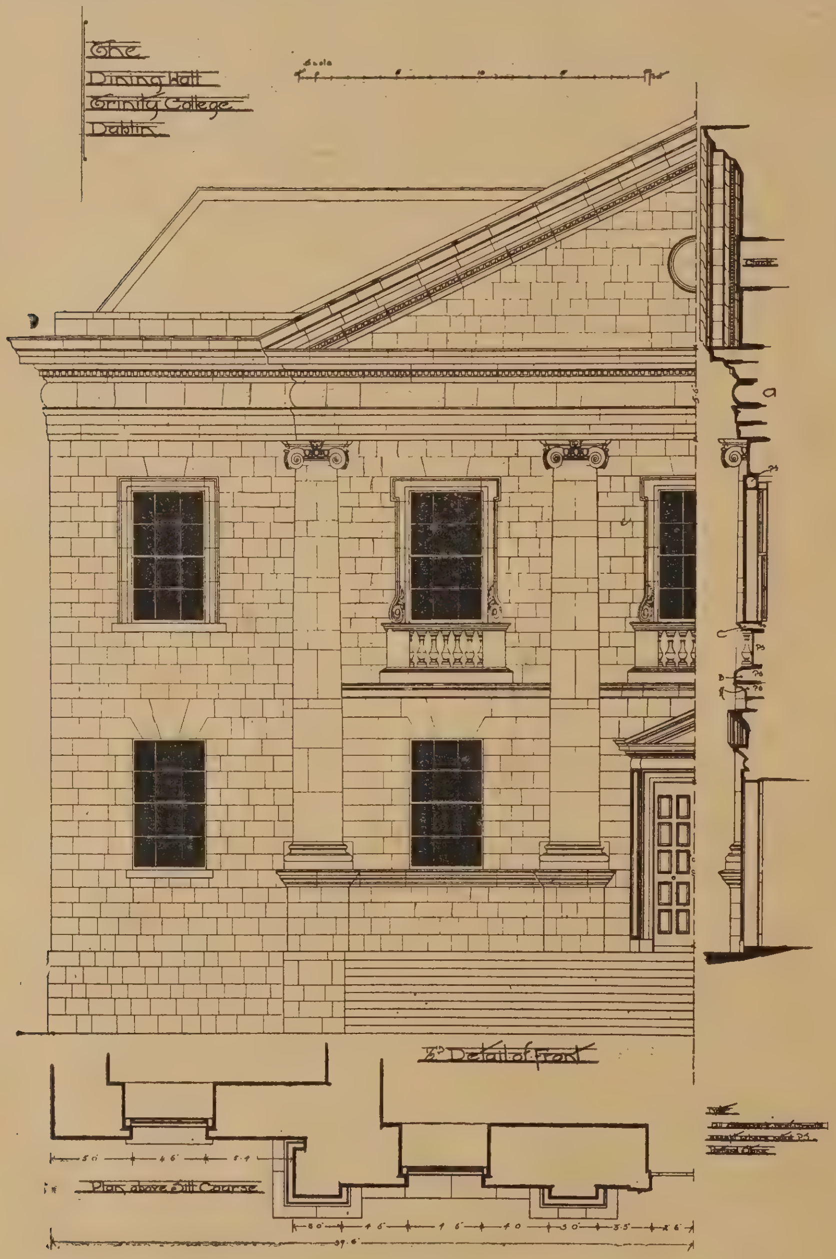
London has, of course, its amazing wealth of noble and illustrative old architecture, from its Abbey of Westminster through all the gamut of styles of the Middle Ages up to the grand chord of the Renaissance in St. Paul's Cathedral; but it is greatly scattered. It is hard to be found out by the student in his limited leisure. He does not, as a matter of fact, seek it out. It is all overflowed by a teeming modernism and the sordid flood of building of a new old city.

Edinburgh has its charms, and they are not in the category of those of any other city of this old land. It has its wonderful beauty of picturesque, almost theatrically-imagined groupings of mountain and architecture and aerial enchantment, though one may think at times of a vision of Durham valley to compare with it, seen once under a supernatural effect of heavenly beauty. If there be not romance, history, and pictorial charm in the architectural grouping of Edinburgh to inspire a student as he passes through Prince's Street to his day's round of mornings, and returns in its sunset effects of evenings, there is no spirit within him. Its architecture, however, taken soberly in items, is of moderate interest and



IRONWORK IN DINING HALL, TRINITY COLLEGE, DUBLIN. DRAWN BY J. F. DELANY.

value. Clear cut out against the sky, on the Calton Hill, is a fragmentary reproduction of ancient Greek architecture—a fine thing but exotic on Scottish soil. Looking another way is a finer monument—the towering pile of Edinburgh's ancient fortress. It has an ancient cathedral, interesting and somewhat characteristic of Scottish peculiarity, but not a great or grand church. It has a modern cathedral, too, of nice and respectable architecture, but of limited interest. The Scott monument is a beautiful and happily placed composition notwithstanding its barbarous detail, and the untutored genius of its architect, putting to shame many professors of cultured and academic design. So, one might go through the monuments of Edinburgh, taken as educational examples for an Art student, without finding any which are great. What it has is, however, piled together to make an incomparable Edinburgh, an architectural dream for the architectural scene painter and poet.



DINING HALL, TRINITY COLLEGE, DUBLIN. DRAWN BY J. F. DELANY.

Give me *Dublin* in fair comparison with other cities of our three Kingdoms, as a satisfying home for a student of architecture if he will only open his eyes. It has in a small circle of streets good architecture, ancient architecture, highly illustrative of architectural styles. It affords groupings of architecture unworked and unpainted, which might make the fortune of an architectural artist.

As to architectural study, I do not believe in a chronological system, that is, beginning at the beginning—say, starting with the bee-hive hut and working the way through the centuries up to Fountains or Canterbury.

Our unequalled English language is as glorious a heritage as our English architecture, and affords an analogy. Who studies English literature according to such pedantic method? We begin with the study of correct vernacular English. If the student is a philologist, he travels backward into the delightful eighteenth century English of Addison, Steele, Johnston, or our own dear old Oliver Goldsmith—farther back through Milton to the glorious literature of the Elizabethan era and the English classic Renaissance—Spencer and Shakespear; further back to Chaucer, representative of English middle ages—further, as the philologist pursues his study, it is even backward through the language of the Norman, Saxon and Celt, Roman, Greek, Hebrew, Sanscrit, to the origin of speech.

The Dublin student may profitably begin his course with latest Dublin architecture, *i.e.* Dublin vernacular, which is to be found in such thoroughfares as Dame Street, and College Green. There are not wanting respectable, and even bold and striking specimens of the modern architect in various moods. Criticism stands silent, for the designers of most of these modern notable buildings are yet with us. It may be said that there is to be studied a good deal of refinement of design. It is at least for the student to exercise criticism as to what is congruous, what incongruous, what to imitate, what to avoid. All study, however, should be in generous and Catholic spirit. It is a characteristic evil habit of smart Dublin people to be Heaven-born critics of architecture as of other arts which they are particularly ignorant of; among professional architects carping criticism is a hateful thing.

After the vernacular or up-to-date buildings of Dublin, the student falls back on the main architectural wealth of the city which distinguishes it, and sets its stamp on it all over—its Classic architecture of the eighteenth century. There is no example that is absolutely uninteresting, and it has a characteristic of its own in abounding beautiful decorative details imported into it by the colonies of Italians and fugitive Huguenots who made Dublin their home in the last century. There is much variety of genius evinced in the works of different architects. These qualities give an interest in the lives and personalities and histories of the buildings of these past masters. To one who has made a study of them for thirty years they become instinct with life. For myself, I could nearly persuade myself that I knew Francis Johnston, architect, as a boy, and had a pinch of snuff from him. Mr. Gandon, the gay and well-mannered French gentleman, I seem to have known. Mr. Cooley I am not well acquainted with; but as for Dean Swift, who cast his keen epigrams and gibes about every public building of his time in Dublin, he is a familar everywhere. I can believe I have met him one day in Ship Street, Dublin, going by way of the castle steps to the Rose Tavern in Castle Street to sup with his knot of the Friendly Brothers of St. Patrick. Arrived at Castle Street, with a side glance he takes in that something is being done at the rival cathedral, relieves himself by an unprovised gibe at his archbishop:—

> Cursed Cobbe from Christchurch the Cross has pulled down,
> And planted what still he more worships—the Crown.

As he turns in the opposite direction where a new gateway has been added to the upper castle-yard it is but to observe that it is surmounted with a petty statue of Justice, which serves to point another gibe at ruling powers. "Her face to the Castle, her back to the people." Many of such yet-remembered epigrams hang about the buildings of Dublin, more specimens of which I may recall hereafter.

Yet another characteristic in which Dublin "has the pull," so to speak, over the new British town of commerce is the presence of picturesque and pictorial capabilities. About its streets and in its cathedrals are bits of pictorial surprises; architectural forms to which time has imparted a happy and softening glamour of colour. They wait for the architect artist when he will break away from the monotony of his squares and drawing-board. Some have asked impatiently where is this beauty to be seen, for instance, and the answer is—everywhere, if you have not been Heaven-afflicted with colour blindness at your birth. Cultivate the faculty of realising beauty by the wayside. Think of what an architect like Ernest George could make of pictorial Dublin. Some have had the privilege, some years ago, of seeing a collection of his drawings at a local exhibition. Study what such an artist would make of a commonplace London thoroughfare—say, familiar Bow Steeple—familiar objects, common cabs, and commonplace shops, when the over-familiarised eye would see nothing in passing by to admire. Mark how the artistic intelligence takes it in, with a delightful play of colour and form and sky, warm reds, and pleasant-toned greys.

There is one piece of advice that may be interpolated here. Never study Irish street subjects anywhere in wet or gloomy weather. Local colour in all Irish towns, and light and shadow—which can be as lovely there at times as anywhere in the world—are only paintable when skies are bright, and roofs and stone and bricks and streetway foregrounds are dry.

And if it be asked by some of the sightless ones where they can be directed to a subject, I would say, for one: Pass the short distance from one cathedral to another as you leave Christ Church by Nicholas Street, and, as you cross the line of the old city wall at Back Lane, take in the picture that squalid, patristic street makes, with Minot's great steeple towering in a sunny haze in the centre, and the pent-house roofs of the middle distance, and the foreground street strewn with parti-coloured wares, vegetables, old clothes, and fish and meat—a busy, lively scene of squalid Dublin life, but a picture subject. Or look about the cathedrals where a water-colour artist may find a score of subjects, always premising that he has bright light; or take even the upper castle yard; not much architecture there, but quaint and Dutch-like, and lovely in local colour when the sun shines bright on its north side. Everyone of us cannot go to Rome, or Vicenza, or Venice, but we might find such subjects as they furnish under like sunny effects of skies in several groupings of our Dublin City Hall, the Houses of Lords and Commons porticoes, and about the precincts of Trinity College.

There may now be said something of the names and personalities of the eighteenth century architects of the English Renaissance, who set their mark on Dublin in an era of passing prosperity and metropolitan existence, under the art patronage of a local aristocracy, with a native parliament. I regret that few of them were of native extraction. One of the earliest who set his vigorous impress on a characteristic Dublin was "made in Germany."

Richard Castles, Cassel, Castle, or Castel, was invited to this country by Sir Gustavus Hume, of the County of Fermanagh, says the record. He was a good specimen of a trained Palladian architect, and must have had some genius for construction, for he constructed the Newry Canal and built the first stone lock in Ireland; but, *teste meo*, carpentry was not his *forte*. The great round room of the Rotunda buildings was among his achievements, and I can say that the original carpentry of that roof, over a circle 80ft. in diameter, is one of the most imbecile and helpless essays at covering such an area I have ever seen.*

The name of Castle brings one in a somewhat inconsequent way to gossip about the first and greatest of Dublin's eighteenth century monuments which Swift, in his pleasantly caustic manner, begins by qualifying as "a building large and lofty" and goes on—

> Not a bowshot from the College,
> Half the globe from sense or knowledge,
> By the prudent architect
> Placed against the Church direct,
> Making good my grandam's jest,
> "Near the Church"—you know the rest.

This is the famed Parliament House of the Kingdom of Ireland, and the terrible Dean goes on, in his scorn of its legislators, to consign them with his good will to a warm location, and would contemptuously permit them—

> Let them, when they first get in,
> Sell the nation for a pin.
> Let them rave at making laws,
> While they set a-picking straws.

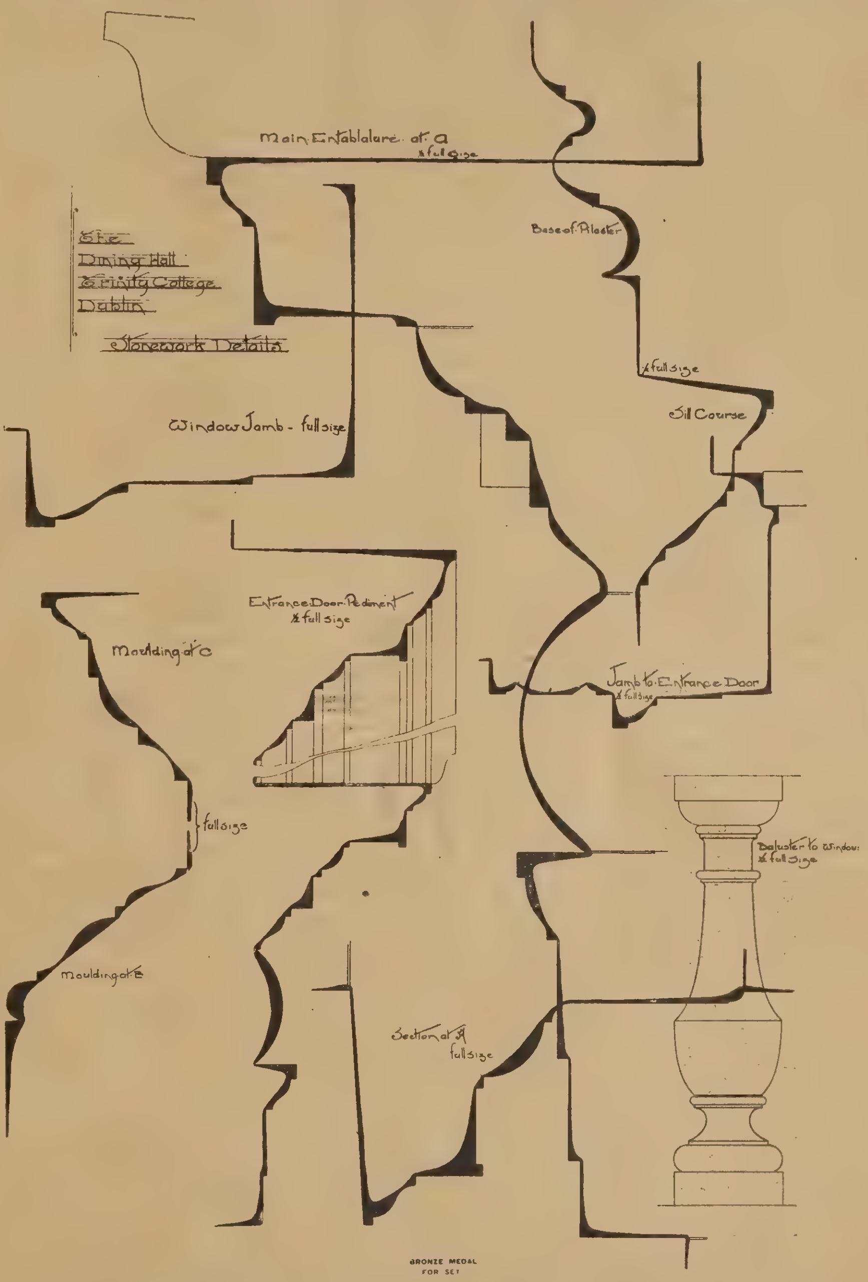
Whatever the legislators may have been, they started a fine monument on a noble and liberal scale about 1728-9. They cleared away old Chichester House, with its gardens running down to the Liffey, and laid the foundation of the Irish House of Parliament. The question is naturally asked: who was the original architect? and here, as history repeated itself in the later building of the Imperial Houses of Parliament, we have a professional scandal and controversy. Captain Edward Lovat Pearce, Surveyor-General, gets the credit in official records; but even in his day there were detractors—one especially who, in correct Latin verse, plainly shadowed the existence, 167 years ago, of the more lately known architectural ghost! Castle, or Castellus, as he calls him, he plainly says was the real architect ghost if people only knew it. A young captain of Neville's troop of Dragoons, and straight from campaigning in the Low Countries, must have been a very remarkable young military man if he had time to acquire such erudite and academic knowledge of Classic architecture as is evinced in the beautiful half-quadrangle court of the Bank of Ireland, with its grand flanking pedimented wings and excellent detail. I don't believe in Captain Pearce. The ghost was somewhere. We are carried back for a parallel to an official superstition of our own day attaching an innate and Heaven-born genius to the corps of Royal Engineers. We carry back our memory to a young Captain Fowke, R.E., architect, born not made, without any architectural training, and who, under a South Kensington ghost system, developed the "Brompton boilers" of 1863, and also spoiled an able architect's design, our Irish National Gallery.

The history of the grand complete design of this Bank of Ireland as we now have it is curious and humiliating to our scholastic prejudices about "composition." In fact, no one designed it. It *grew* by a series of happy accidents, or rather, the four or five architects who in a century's course followed Pearce or Castle, were wonderfully sympathetic and self-suppressive.

The original conception was but the Centre Courtyard design, flanked and hampered by mean houses abutting on each side. Daly's famous club-house shouldered it on the west; other mean neighbours upon the east, for Westmoreland Street and College Street were not to come for eighty years after.

The first architect to go beyond this was Robert Parkes, who in 1787 had the ground cleared for him of Daly's Club, and Foster Place became possible. With great judgment he invented the quadrant sweep, in his day an open loggia of detached Ionic columns, curving towards the western portico which now fronts Foster Place. A little later, James Gandon had the chance to erect a lords' entrance at the east. He followed Parkes' idea of the quadrant sweep, but in his work treated a solid plain wall with mock window recesses. I have lately deposited in the National Museum, Gandon's original drawing by his own hand which makes this clear. We all in Dublin know the story of him and the use of Corinthian columns under an Ionic entablature in his west portico, and his reply when he was twitted with questions as to what order of architecture this was. "The order of the House of Lords and be d——d to them."

(To be continued.)



DINING HALL, TRINITY COLLEGE, DUBLIN: DETAILS OF STONEWORK. DRAWN BY J. F. DELANY.

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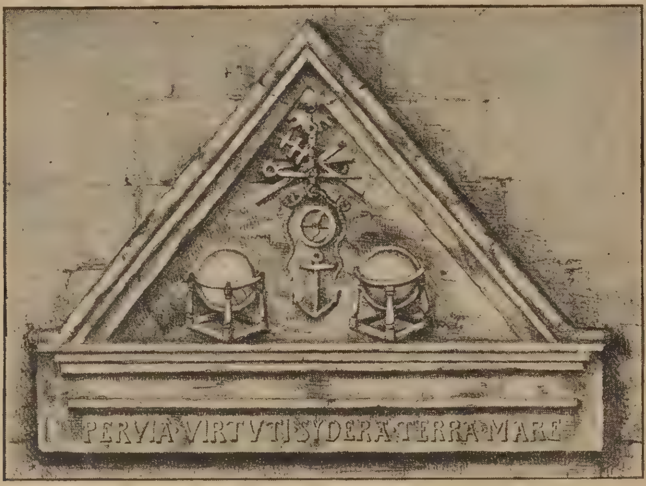
* In connection with the study of roofs to be made in Dublin buildings, the student is advised to give attention to the roof over the round room of the Mansion House, a circle of 100ft. in diameter. It is without lateral tie from the wall-plate to the apex, unpurlined, unstrutted and stable. It is a remarkable but very simple construction, of which detailed drawings would be interesting. It is credited to an architect named Semple, and was said to have been built up within six weeks for the City Banquet given to George IV. in 1821.


PER VIA VIRTVTI SYDERA TERRA MARE

TABLET AT TRINITY HOUSE, LEITH.

THE ARCHITECTURAL ANTIQUITIES OF LEITH.*

By JAMES CAMPBELL IRONS.

THE origin of the Port of Leith is wrapt in obscurity. The first reliable mention of Leith is in the foundation Charter of the Abbey of Holyrood House, granted by David I. in 1128, and it is stated that the first houses erected in Leith were built in the twelfth century on land bounded on the south by the Tolbooth Wynd, on the west by the shore or quay, and on the east by the Rotten Row, now called Water Lane or street. The architecture of these would, no doubt, be adapted to the age in which they were constructed. Such specimens of ancient architecture as survive everywhere reflect, to a large extent, the feelings, thoughts, aspirations, and ability of the inhabitants of the times. Ruskin truly says that "the art of man is the expression of his rational and disciplined delight in the forms and laws of the Creation, of which he forms a part," and so in the measure in which his reason has been disciplined by the wide study of these forms and laws, cultured by the varied knowledge of their beauty and adaptability, will his expression of them in art be rude or refined. This is well illustrated by reference to ancient Greek and Roman architecture, as well as by the more modern examples of Gothic, Byzantine, and Norman architects, but, above all, by the fact that in all the schools the best examples of this art are to be found in connection with the highest and noblest faculty of man—his religion. The Church in all ages has claimed and found the highest and best expression of man's art in the designs and building of her cathedrals and churches. It would be idle, therefore, to go to a small seaport on the east coast of Scotland in search of noble examples of architecture.

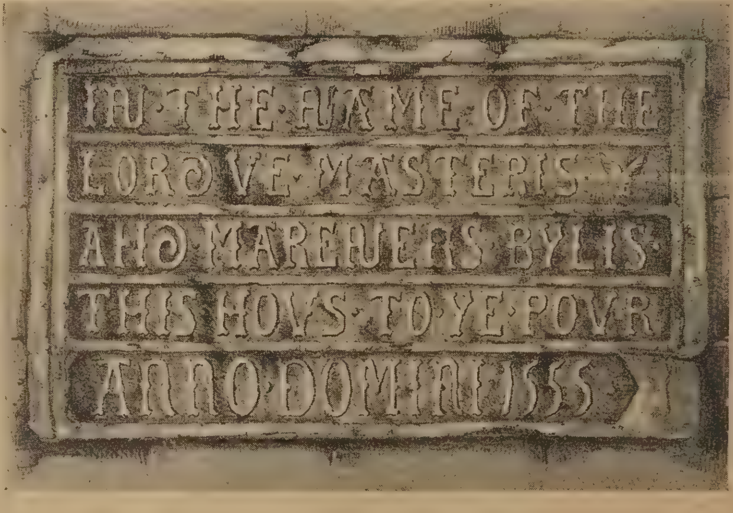
Imagine, then, that instead of sitting here in this beautiful hall, listening to the dilettante day dreams of an over-worked lawyer, you are sitting or walking on the margin of a lovely loch, and desire to pay a visit to the seaport of Leith. You send to-day to book your seat on the coach for to-morrow for the journey to Leith. Starting from the High Street, you wend your way by a road somewhat near the present Easter Road through green fields and pastures gay. On reaching the roadway which now forms Leith Walk, the first building which strikes your eye would probably be Pilrig House. Regarding it Mr. Balfour Paul says in your own transactions that there is not much to be definitely ascertained about the lands of Pilrig in very ancient times. It must always have been a place of considerable amenity, and its proximity both to Edinburgh and Leith would make it valuable both as a residence and for agricultural purposes. There was a curious tradition which lingered in a family, the last survivor of which I, as a boy, can remember. He dwelt as his people had, I believe for many generations, in a cottage with a kailyard attached, at the head of the old avenue, and between it and Leith Walk, as a tenant of the laird. The site of his cottage is now occupied by Balfour Street. The tradition I refer to, which he always maintained to be correct, was to the effect that Pilrig had been a country residence of Mary of Gueldres, the Queen of James II., the foundress of Trinity College. This would take us back to the middle of the fifteenth century. Coming to actual facts, we find a Monypenny in possession of the lands in 1506, and his descendants held them for many years after. They were part of the large barony of Broughton, which David I. had granted to the Abbey of Holyrood. After the Reformation, Adam Bothwell, Bishop of Orkney, got a grant of the barony, which he in his turn surrendered in 1587 in favour of Sir Lewis Bellenden of Auchnowl, the Lord Justice Clerk.

From the Monypennys the lands of Pilrig passed to Gilbert Kirkwood in 1623. He it was who built the house which still stands, a good example of the style of the period—as Messrs. MacGibbon and Ross say (Castellated and Domestic Architecture of Scotland, vol. V., p. 343)—in the absence of all defensive features, and the introduction of Renaissance details in its quaintly formed gables and chimneys.

The original entrance door was on the ground floor, and was surmounted by a carved pediment, containing probably the arms of the founder and of his wife, Margaret Foulis. Their initials, G. K. and M. F., are cut on each side of the shield, and the verse of scripture—"For we know that if our earthly house of this tabernacle were dissolved," &c. The date of the actual erection of the house is 1638, as shown by its being carved on two of the windows. The west gable is of exceptional thickness, having to hold a wide kitchen chimney; this makes space on the first floor for a deep alcove on one side, and a small strong room on the other, at one time probably furnished with an iron door. At present there is within it a fine iron chest, which tradition says was one of the "treasure chests" contained in one of the ships of the Spanish Armada. The door into the garden from the first floor is a later alteration, though it is probably earlier than the time when the new dining-room and drawing-room were built. I do not know whether Gilbert Kirkwood has the credit of planting the long avenue to the south of the house, leading up to Leith Walk, or of laying out the grounds as a whole, but no doubt they were laid out about that time and the whole place must have had singularly pleasant surroundings; indeed, up to quite recent years, when the stone-and-lime demon could no longer be repelled from its vicinity, it continued to be a very pretty old-world spot, and so long as the old house stands, and the garden blossoms and fruits year by year, it will never altogether lose its character.

SEAL OF THE PRECEPTORY OF ST. ANTHONY.

The Kirkwoods disappeared from Pilrig after what must have been a comparatively short reign, for in 1717 it was sold by Sir William Douglas to William Alves. Indeed for the next year or two it changed hands with quite startling rapidity. Alves sold it in the same year in which he bought it to Lord Rosebery, and he in his turn seems to have almost at once disposed of it to James Balfour, merchant in Leith, in whose family it has remained ever since. While the Balfours only became possessed of Pilrig in 1718, some family of the name had lived in the neighbourhood many years before; for we find the lands of John Balfour mentioned as bounding a croft



TABLET AT TRINITY HOUSE, LEITH.

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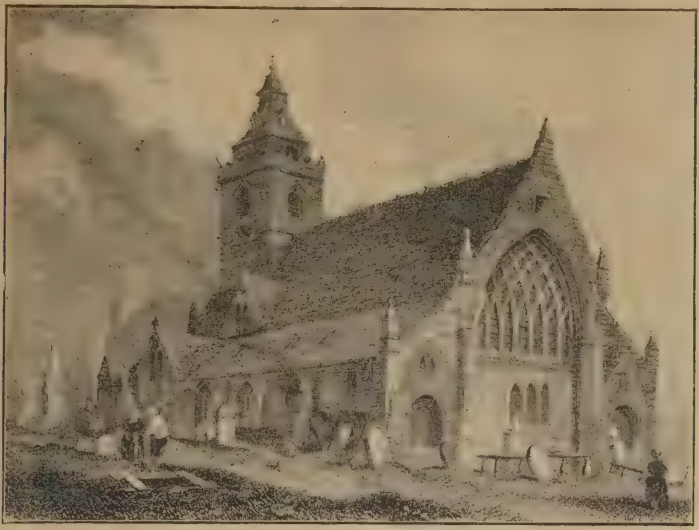
* A paper read before the Edinburgh Architectural Association on March 8th, 1899.



ST. MARY'S CHAPEL, SOUTH LEITH.

granted by Matthew Forrester, the head of St. Anthony's Preceptory, Leith, to David Forrester, in a charter which was confirmed by the King on 23rd January, 1570-1571.

Readers of Robert Louis Stevenson's books (whose mother was the daughter of a cadet of the Balfours of Pilrig) will remember that at the end of "Kidnapped" the heir is left on the point of going to consult his kinsman, the laird of Pilrig, and he figures somewhat largely in the subsequent account of David Balfour's adventures in "Catriona." James Balfour, the laird referred to, was Professor of Moral Philosophy from 1754 to 1764, when he was transferred to the Chair of Public Law, which he held for fifteen years. He was also Treasurer of the Faculty of Advocates. (Trans. Edinburgh Arcitectural Association, Vol. II., p. 204.)

Proceeding down Leith Walk, you enter what is now the Kirkgate. A few yards from the top of this stood the ancient Monastery of St. Anthony, erected by Sir Robert Logan. It was situated near where the Parish Church of South Leith now is, on the west side of the lane known as St. Anthony's Lane. Little or nothing is known of the architectural construction of this monastery, save that it was a building of considerable size and strength. On its tower the French placed their artillery during the siege of 1560, when the building was partially destroyed; it was partially restored and converted into King James's Hospital in 1614. All that remained of this ancient and interesting edifice a few years ago was a portion of the doorway and arch, but even these have now been swept away, and nothing now remains to tell of the existence of this monastery save the revenues of King James's Hospital, which are collected by South Leith for behoof of the poor of the parish.

The Rental Buke of Sanct Anthon's and Newhaven, written on vellum, and consisting of a thin octavo volume of twenty-one leaves, is still preserved in the Advocates' library at Edinburgh. There is not much recorded in it about the rentals or indeed any of the secular affairs of the monastry. It contains a list of benefactors and the form of initiation into the confraternity of St. Anthony, the rules to be kept and the indulgences to be gained by its members. The seal also of the preceptory is likewise preserved in the same library. It bears the inscription *S. Commune Preceptorie Sancti Anthonii prope Leight*, and assumed a very graceful form, representing the saint gowned as a hermit, standing under a canopy. Behind him, and showing chiefly at his right foot is the wild pig with the bell on his neck. The bell is again happily repeated in the lower part of the design, while in its upper part appears the capital T, or Tall Cross, which was made of blue stuff, and sewn on the left breast of the black mantles that were worn as the distinguishing garb of the canons of St. Anthony. It is probably a production of the sixteenth or seventeenth century.

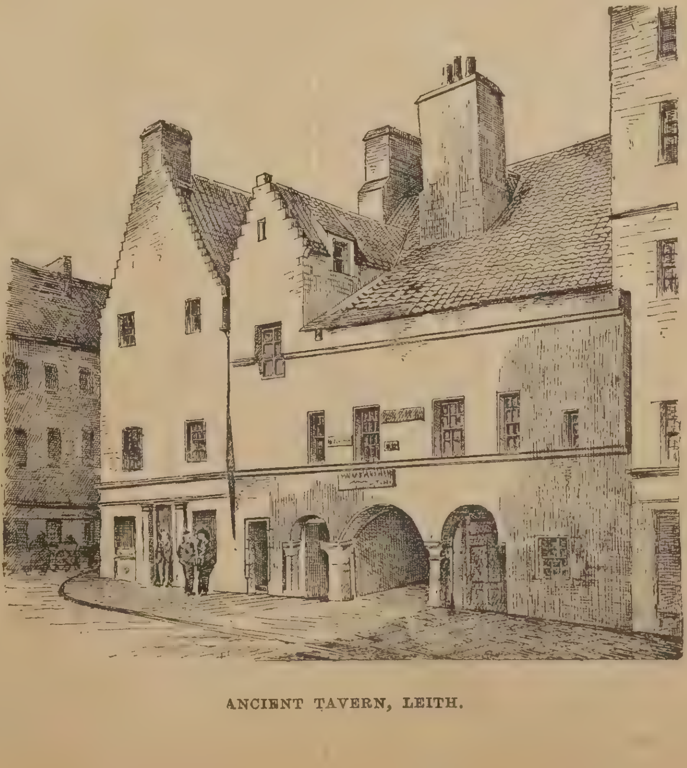
In 1817, on the site of the old building, the present Trinity House was erected on the western side of the Kirkgate, and opposite to St. Mary's Church. Two of the tablets that adorned the ancient hospital were built into the south wall, which faces Giles Street. One of them, surmounted by a pediment elaborately sculptured with an anchor, globes, and a group of nautical instruments, is inscribed :—*Pervia . Virtuti . Sydera . Terra . Mare.* On the other is cut in large ornamental characters of that olden time the following inscription : —*In . The . Name . of the . . Lord . Ve . Masteris . and . Mareneris . Bylis . this . Hous . To . ye . Pour. Anno . Domini*. 1555.

In 1848, while Mr. George Adinston McLaren was provost of Leith, and a member of South Leith Church, it was repaired and altered. The architect superintending the restoration was Mr. Thomas Hamilton. A new square tower, terminating in a richly cusped, open Gothic balustrade, was erected at the west end, and around the building were placed buttresses finished with crocketed finials. Wilson says: "St. Mary's Church, as it existed at the time our drawing was made, showed at the east end two of the four great central pillars of the church, and was otherwise finished by constructing a window in the upper part of the west arch of the central tower, much in the same style as was adopted in converting the nave of Holyrood Abbey into a parish church. The date 1614, which was cut on the east gable, probably marked the period at which the ruins of the choir were entirely cleared away. The side aisles appear, for the most part, to be the work of the same period. A range of five dormer windows was constructed at that date above both the centre and side aisles, and, though a novel addition to a Gothic Church, must have had a very picturesque and rich effect. The whole of these, with the exception of the two western ones on the south side of the church, were taken down in 1747" (vol. 2., p. 193), and the remaining ones were removed in 1847, along with the east and west gables of the church. By the removal of the high-pitched roof of the side aisles there was brought to light a range of very neat, square-headed clerestory windows, which had remained concealed for upwards of two centuries, and which have been retained in the restored building.

The hand of the restorer has, during the last fifteen years, been again at work on this interesting old church, which is now one of the most beautiful ecclesiastical buildings in Scotland. The pulpit, which was an old "three-decker," has given place to an exquisite alabaster and marble pulpit—one of the finest to be found out of Italy—of hexagonal shape, with marble figures of the four Evangelists and of the Good Shepherd, on five of the panels, while the sixth side forms the entrance to the pulpit, which rests against the second pillar of the church.

On the opposite side of the street was an ancient tavern or hostelry, stated to have been visited by Queen Mary, Charles I. and Cromwell. It was also said to have been the scene of the murder of two Frenchmen under rather tragic circumstances. The building is rather a characteristic specimen of ancient Scottish architecture. It was for some time a question whether this was the same building as the fine arcaded house we now show you, but I think there can be little doubt that it is the same place.

To the east of the Trinity House, on the north side of the Kirkgate, a very singular building fronted the main street at the head of Combe's Close. The upper storeys appear to have been erected about the end of the sixteenth century, and formed rather a neat and picturesque specimen of the private buildings of that period. But the ground floors presented different and altogether dissimilar features. An arcade extended along nearly the whole front, formed of semi-circular arches, resting on massive round pillars, finished with neat moulded capitals. Their appearance was such that even an experienced antiquary, if altogether ignorant of the history



ANCIENT TAVERN, LEITH.

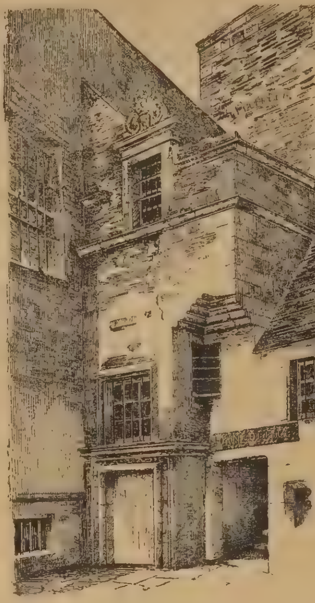
of the locality, would at once pronounce them to be early and very interesting remains, probably of the style of the sixteenth century.

That they were of considerable antiquity cannot be doubted. The floor of the building was several feet below the level of the street, and the ground had risen so much within one of the arches which served as an access to the court behind that a man of ordinary stature had to stoop considerably in attempting to pass through it. No evidence is more incontrovertible as to the great age of a building than this. Other instances of a similar mode of construction are, however, to be found in Leith, tending to show that the style of architecture is not a safe criterion of the date of their erection. The most remarkable of these is an ancient edifice in the Sheep's Head Wynd, the ground floor of which is formed of arches constructed in the same early style, though somewhat plainer and less massive in character, while over the doorway of the projecting staircase are cut in ornamental characters the initials and date D.W. M.W. 1579. The edifice, though small and greatly dilapidated, is ornamented with string courses and mouldings, and retains the evidences of former grandeur amid its degradation and decay. Maitland refers to another building still standing at the north-west corner of Queen Street, which in his day had its lower storey in the form of an open piazza; but modern alterations have completely concealed this antique feature. Here was the Exchange, or meeting-place of the merchants and traders of Leith for the transaction of business, as was indicated by the popular name of the Burss—evidently a corruption of the French term of Bourse—by which it was generally known at a very early period.

Entering from the Kirkgate is the original doorway of Lord Balmerino's house with some very quaint and rather peculiar corbelling bringing a broken angle into the square above and, so far as my knowledge goes, it is a unique specimen of this contrivance which was such a favourite device of the Scottish builders of this period. Considerable picturesque effect is got beneath by placing the window at a curious angle; the dormer window above is of the same quaint design as the windows of Heriot's Hospital, Glasgow College, and Winton House, with the same open fretwork.

On the east front of the house and behind the Roman Catholic Church there is a remarkably fine specimen of pure Renaissance architecture. It appears originally to have been a doorway with Corinthian fluted pillasters with frieze and pediment above—the whole thing being of the most delicate and refined detail. It is now used as a window and has been so for long—the wood work with the tramsome being of great interest, and is the very kind of thing which modern architects are trying to introduce to supersede the plate glass window which ruled in our windows some years ago. This is probably the work of one of the Adams.

One of the earliest dates that has been discovered on any of the old private buildings of the burgh occurs on the projecting turnpike of an antique tenement at the foot of Burgess Close, which bears this inscription on the lintel in Roman characters: "Nisi. Dvs. Frvstra. 1573." There is, however, an earlier date, as we shall see. This date is inscribed on the hand-saw device on the lintel, so characteristic of Italian work. Burgess Close is the earliest thoroughfare in Leith which we find mentioned, being granted to the burgesses of Edinburgh towards the close of the fourteenth century by Logan, of Restalrig, as a means of access to the shore. But the straitened proportions of this narrow alley, as it was then, and through which the whole exports and imports of the shipping of Leith was conveyed, soon proved so inconvenient that the Laird of Restalrig was compelled to grant a more commodious access.



ORIGINAL DOORWAY OF LORD BALMERINO'S HOUSE.

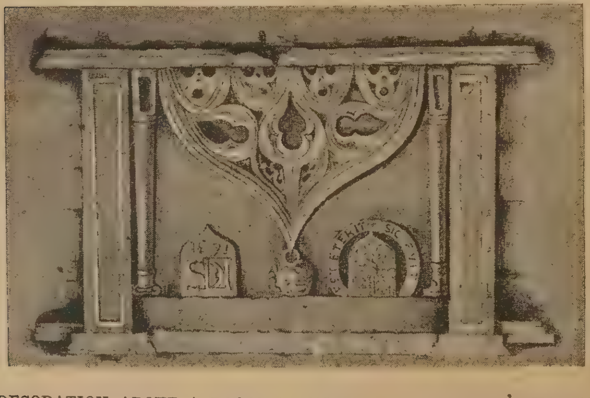
"The inscription," says Wilson, "which now graces this venerable thoroughfare, though of a date so much later than its first construction, preserves a memorial of its gift to the civic council of Edinburgh, as we may reasonably ascribe to the veneration of some wealthy merchant of the capital the inscribing over the doorway of his mansion at Leith the very appropriate motto of the city arms. To this, the oldest quarter of the town, indeed, we must direct those who go in search of the picturesque." But the old Burgess Close has been swept away, and a much wider thoroughfare now occupies its place.

(*To be concluded.*)

Messrs. W. H. Murray and Company, of 47 and 48, King William Street, E.C., have obtained the contract for the supply of 6,000ft. of Yorkshire stone to the Greenwich District Board of Works.

The New St. George's Hall and Schools just erected in the Old Kent Road, by the South-east London Mission of the Primitive Methodists, were designed by the late Prof. Banister Fletcher.

The New Church at Stanton Hill, the foundation stone of which was laid by the Countess Dowager of Carnarvon, is to cost about £1,400. The plans have been prepared by Mr. P. H. Curry, of Derby, who has adopted the Early English style, cruciform, with nave, chancel, vestry, organ chamber, and west porch, open timber roof, done with red tiles. Mr. R. Wilson, of Skegby, is the contractor. The building will seat 360 persons.



DECORATION ABOVE A DOORWAY IN LORD BALMERINO'S HOUSE.

. . A NEW . .

TRADE JOURNAL

(ISSUED TO SUBSCRIBERS ONLY).

There will shortly be published, from the offices of the BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, a trade journal for all interested in Furniture, Decoration, Upholstery, Art Metal Work, Stained Glass, Ironmongery, Brassfoundry, Electroplate, and Art Pottery.

THE FURNISHER,

as the new journal will be named, will be produced in a style never before attained by any trade journal. The paper and printing will be of a superior quality, and the illustrations will be reproduced in a style similar to those in the ARCHITECTURAL REVIEW and other high-class Magazines.

THE FURNISHER will contain articles by

Acknowledged Experts

in their respective trades, and will illustrate the work of the most eminent designers and manufacturers. The subjects treated will include all branches of the furnishing trades, and the journal will be, in fact,

Seven Trade Journals in One.

Suggestions of the greatest practical value to all engaged in the trades, whether manufacturers or retailers, will be given

All trade news will appear in THE FURNISHER, new inventions will be noted, new books reviewed, and questions of interest discussed. Commercial information will be given in detail, and the journal will be indispensable to every person who designs, manufactures, sells or buys what goes to the furnishing or decoration of either public building or private house.

THE FURNISHER will be published monthly, price 6d., but will only be obtainable by Subscribers, who must be connected with the Trade.

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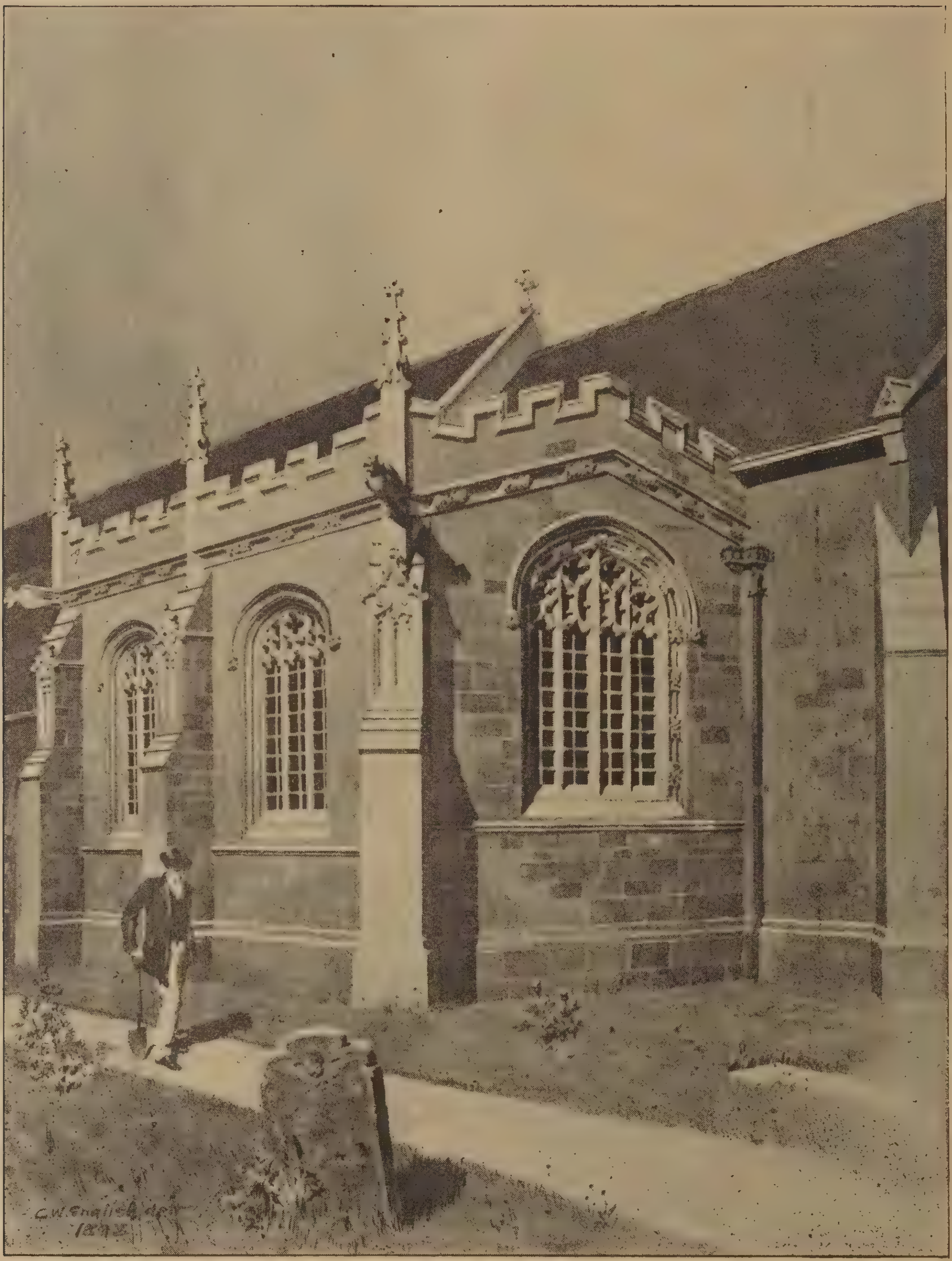

BROCKLEBANK MEMORIAL CHAPEL, HESWELL, CHESHIRE.

J. Francis Doyle, Architect.

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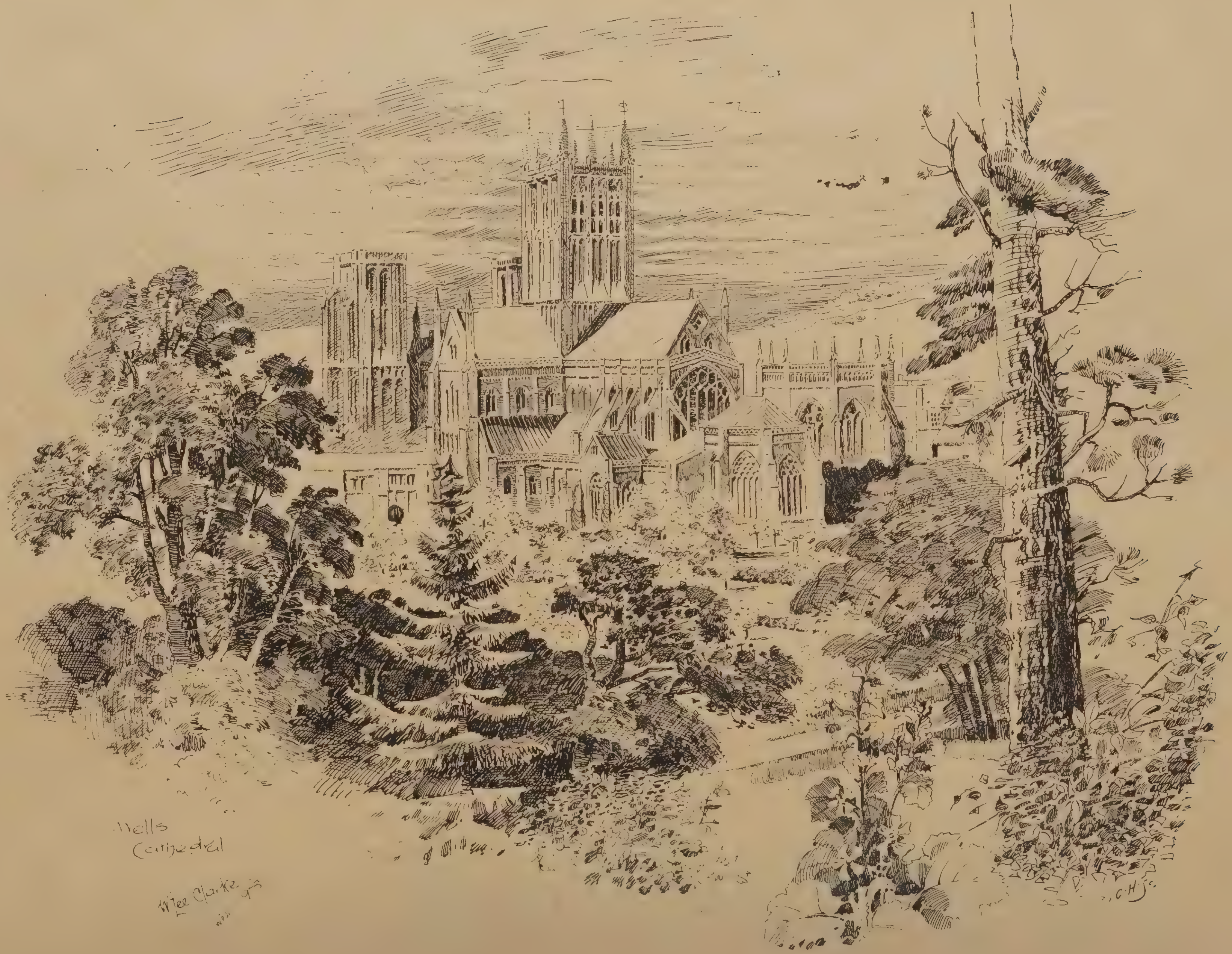
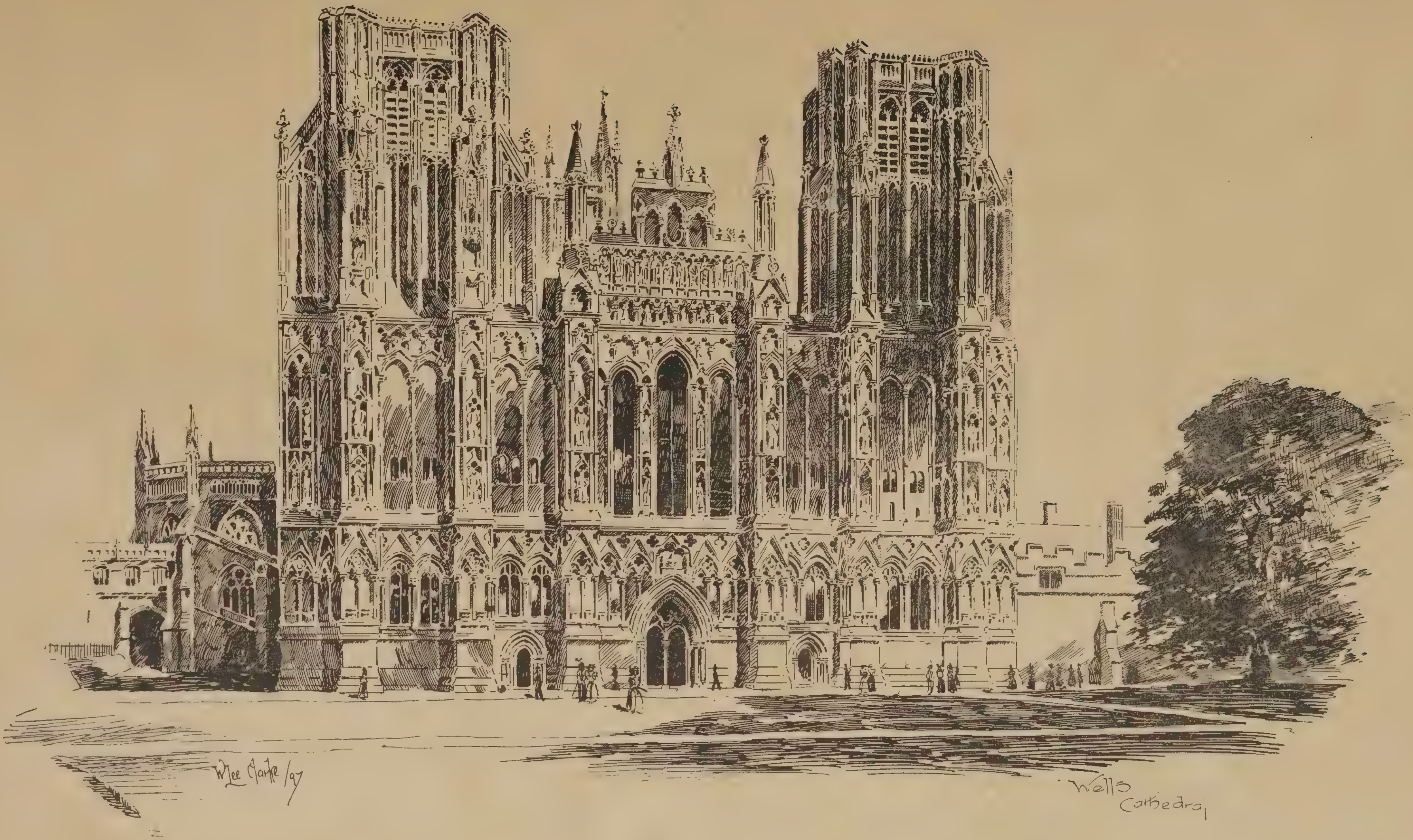


WELLS CATHEDRAL. DRAWN BY W. LEE CLARKE.



WEST FRONT OF WELLS CATHEDRAL. DRAWN BY W. LEE CLARKE.

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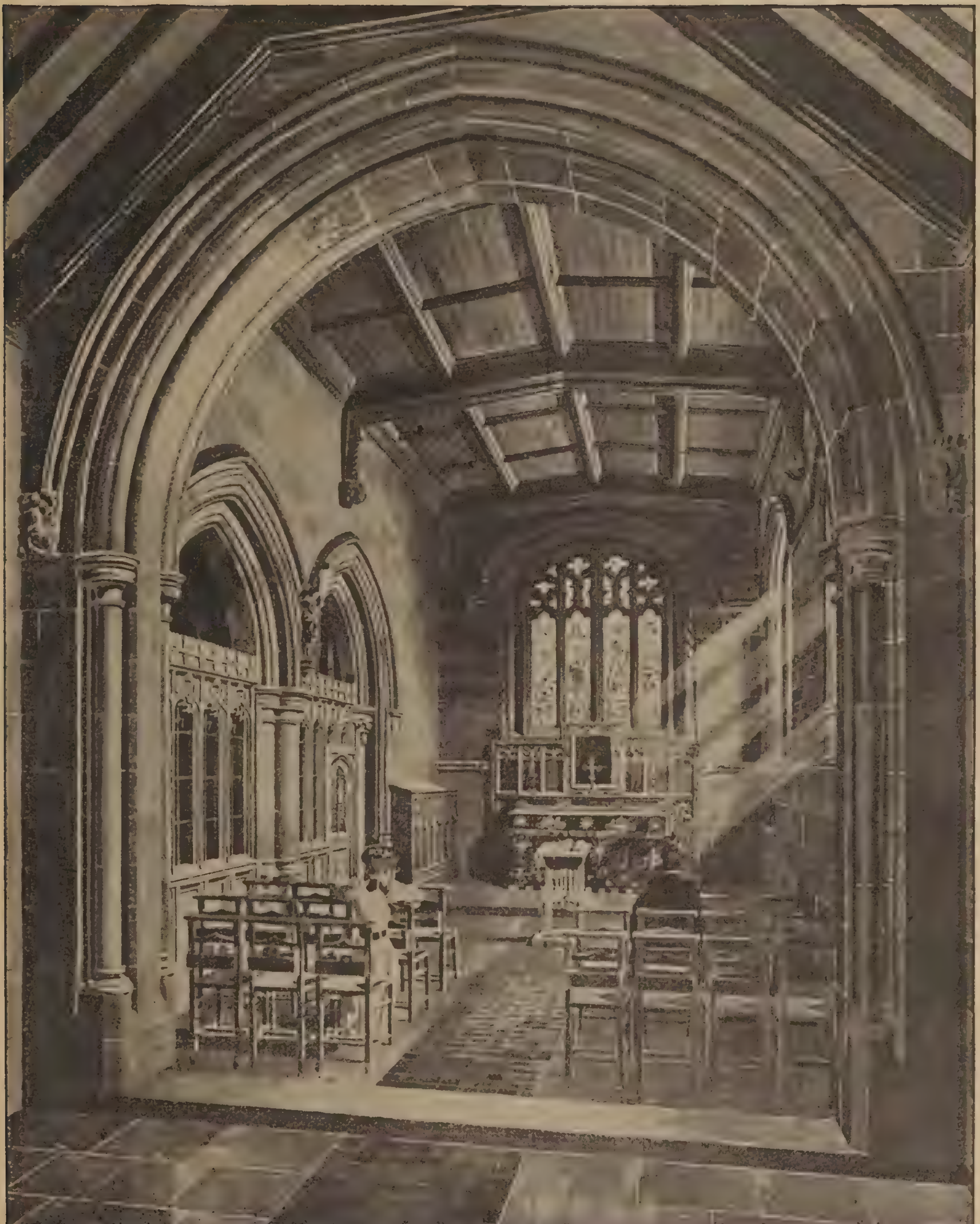

BROCKLEBANK MEMORIAL CHAPEL, HESWELL, CHESHIRE. INTERIOR.

J. FRANCIS DOYLE, ARCHITECT.

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Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

RIGHTS OF LIGHT.

To the Editor of The Builders' Journal.

Hove.

Sir,—I thank you for your esteemed reply in your issue of the 9th inst. The question is printed thus: "There are windows at side of house." It should read, "There are no windows at side of house." Would this fact alter your opinion?—Yours truly,

Conservative.

The answer is correct in regard to the question as originally submitted. The word "no" was omitted by a printer's error.

BOOKS FOR BUILDING CONSTRUCTION STUDENTS.

To the Editor of The Builders' Journal.

Cambridge.

Sir,—I shall deem it a great favour if one of your valuable contributors would kindly inform me what is the best text book on mechanics (practical) in the building trades, or the best on machines in use, such as the winch, derrick crane, pulley blocks, and methods of hoisting and conveying materials. Also works on graphic statics, algebra and mensuration, and simple mathematics, suitable for a building construction student working for Honours Certificate, and encountering difficulties in the formulæ.—Yours, &c.,

JASMINE.

The best books you can have are as follow; they can be obtained for the prices quoted from Mr. B. T. Batsford, of 94, High Holborn, W.C. Tarn's "Mechanics of Architecture," 6s., post free. Middleton's "Stresses and Thrusts," 4s. 2d., post free. Higg's "Algebra Self-Taught," 2s., post free. Mitchell's "Elementary and Advanced Building Construction," post free for 2s. 6d. and 4s. 6d. respectively.

SANITARY CERTIFICATE AND HYDRAULIC LIME.

To the Editor of The Builders' Journal.

Seaforth.

Sir,—I should be obliged to you if you would, in the next issue of the Journal, advise me what to do in the following case: (1) I have for three months been preparing for the Manchester exam. of the Sanitary Institute in December, but I have been told that it is only a waste of time and money, as the Local Government Board are issuing a certificate to candidates successful in examination, and that the certificate of the Sanitary Institute will be of very little use, that the value of the L.G.B. certificate will be so much greater. Would you kindly tell me if it would be advisable to try for the Sanitary certificate in December, or wait and try for the new one. (2) Also in the following: If I went on to a job where hydraulic lime was supposed to be used for the mortar, and the mortar was not ground on the job, what would be the best way to tell whether the lime was hydraulic or not? Thanking you in anticipation, and wishing your paper continued success.—Yours, &c.,

APEXIS.

(1) All appointments of the nature referred to are made subject to the approval of the Local Government Board, such approval being rarely withheld when evidence of competence, in the form of the certificate of the Sanitary Institute can be produced. (2) It would be best to take some of the lime, mix it with sand to a mortar, make a sandwich of it between two bricks, lay in water and await developments. If something more rapid is required, place a little of the lime in a saucer, and pour hydrochloric acid over it, when all the lime will dissolve away with effervescence, leaving a residue of clay if it be hydraulic, of sand if it be poor, and no residue if it be pure.

G. A. T. M.

BOOK ON BUILDING CONSTRUCTION.

To the Editor of The Builders' Journal.

London, S.E.

Sir,—Will you kindly inform me as to the best book I could get on "Building Construction."—Yours truly,

J. C.

The standard work on the subject is Rivington's "Notes on Building Construction," and you cannot do better than obtain this It is published by Longmans, Green and Co., and the price of Part I. (elementary stage) is 10s. 6d.

REVERSE MOULDINGS.

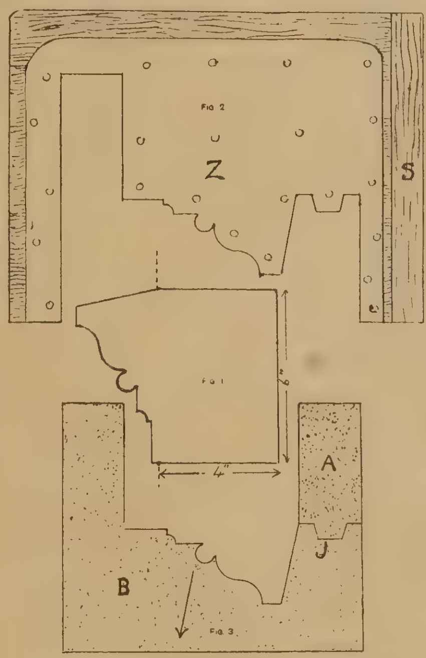
To the Editor of The Builders' Journal.

Sheffield.

Sir,—Could you inform me the best way of making a reverse mould for casting concrete impost moulding? A sketch illustrating method would be useful to me as well as other readers of the Builders' Journal.—Yours, &c.,

F. S.

Cast concrete mouldings for brick façades are usually designed by the architect to fit the thickness of one or more bricks, so as to avoid cutting the brickwork, and to enable the brickwork and concrete mouldings to "course." The concrete mouldings are made with a sufficient breadth so as to form a bond or bed in the wall. Fig. 1 shows a section of a simple moulding sufficient to elucidate the method of setting out a reverse running mould and casting mould for casting concrete impost mouldings. The moulding is 6in. deep, as figured, to suit two courses of brick, and has a bed of 4in. The dotted lines indicate the face of the brickwork. The running mould for forming a reverse casting mould is cut from the inner profile of the given design of a moulding, being the reverse way used for an ordinary running mould, which is cut from the outer profile of the design. Fig. 2 shows the section of the running mould, Z is the zinc plate nailed on to the stock of the mould, and S is the slipper. The running mould is used for running the casting mould; a casting mould made by the reverse method is run direct with a reverse running mould, which is the contrary way employed for an ordinary casting mould, which is always taken from a model or moulding-piece. Some mouldings require a reverse piece mould, as in the present case. The loose pieces are used for under-cut parts on the mouldings, and to enable the cast to be easily extracted from the mould. The setting-out of a reverse running mould requires considerable skill and care, so that the necessary loose pieces will be strong, work freely, and have the joints at the proper places and angles. Fig. 3 shows the section of the reverse casting mould; B. is the body of the mould as run by the running mould. When setting out a reverse running mould having loose pieces, as shown at A, run joggles should be allowed for where space permits. A run joggle, or sinking, is shown at J. The loose piece A is formed on the body of the mould by the aid of two rules, one fixed on the inside and one on the outside of the body of the moulding. The loose piece can be stopped from moving lengthways by filling up two or more parts of the run joggle, each part being about 2in. long. These parts must be well scratched before the plaster is applied to form the stops. The ends of the casting mould are formed with wood stops. Plaster moulds for casting concrete should be allowed to dry, and then seasoned by coating the surface three or four times with a combination of linseed oil and boiled oil. When the casts are filled in and set, a board should be placed on the top of the mould, and then the whole turned over, so that the cast will lie solid on the board. The body of the mould should be drawn off in the angle most suitable to free the mouldings, in the present case as shown by the dart. Beads that are highly undercut may be "humoured" when setting out the running mould, and the undercut formed by the aid of a file while the casts are green. Large beads having deep undercuts may be readily formed by means of a loose piece, but as this method entails a joint on the bead, which is somewhat difficult to clean off the cast, it will in some cases be found advisable to relieve the bead with the aid of a file.



W. MILLAR.

BOOK ON ARCHITECTURAL DESIGN.

To the Editor of The Builders' Journal.

Gravesend.

Sir,—Will you or any of your readers kindly inform me of the title of a suitable text book to study architectural design? I should like a practical book, as I wish to sit for the examination of the Science and Art Department next year.—Yours respectfully,

VESWOR.

The best book you can have is Fletcher's "History of Architecture," published at 12s. 6d. This can be obtained from Mr. B. T. Batsford, of 94, High Holborn, W.C., post free for 10s.

A BOTANICAL GROWTH.

To the Editor of The Builders' Journal.

Loughboro'.

Sir,—I shall be much obliged if you will explain to me the growth of which I send a sample which I have found forcing its way through an old 9in. internal brick wall. Apparently it has originated from an oak lintel, of which I send you a small piece, showing the discoloration on the face. From this point in the wall the growth I have sent you is a specimen of what I have found between the bricks and the mortar joints, both vertical and horizontal for a distance of at least 5ft. from this lintel. It has also forced its way between the joints of the "relieving arch in cement" over same, and the "plaster" on both faces of the wall. In some instances it seems to have destroyed the nature of the mortar, but not in all cases.—Yours, &c.,

A. L. R.

We are indebted to Professor J. B. Balfour, Regius Keeper of the Botanic Gardens, Edinburgh, for the following reply: "The membranous growth is the mycelium of a fungus and, I believe, the dry-rot. It is either that or one of the Polypori, perhaps *polyporus vaporarius*. It is not a robust growth, but it has undoubtedly been growing under the usual conditions which dry-rot affects. The piece of oak lintel has upon it a growth of a fungus belonging to the genus *sporodesmium*, and the black spots are the spores. The pink colour is perhaps due to some change the fungus has brought about in the wood. The plant is probably *sporodesmium polymorphum*, and it grows freely as a saprophyte upon decayed wood."

WELLS CATHEDRAL.

By W. LEE CLARKE.

The City of Wells is situated in a wide, rich valley, with the rocky Mendips backing it on the north side. It is a quiet and clean little place, still it would be worthy of little notice but for its cathedral. This building is admirably placed. When the cathedral green, a large fine lawn, is entered through a gateway from the market square, the finest view of the western façade is obtained, as shown in the illustration in our centre plate.

Of this west front, Collison says, "It is esteemed one of the most superb pieces of Gothic architecture in the kingdom, being loaded with a profusion of beautifully-carved images in niches or recesses, the vaults of which are supported by slender pillars of Purbeck marble." The images are all symbolic. At the top of the central gable stand the twelve apostles; below them is the hierarch. Representations of the resurrection; life-size statues of kings, queens, bishops, &c., are depicted, being examples of the very highest type of Early English carving.

The cathedral is surrounded by the finest collection of domestic buildings to be found anywhere. This may be attributed to the fact that Wells was never a monastic foundation, each official having his own dwelling.

The peculiar charm of this cathedral lies in the union and harmonious grouping of the various parts, palace, cloisters, lady chapel, choir, &c. These parts, if examined separately, may be equalled or possibly excelled in beauty by other cathedral buildings, but as a group of buildings, Wells certainly has no equal. To appreciate this beauty it is necessary to climb to the woods on the Shepton Road, from which spot a fine spectacle is obtained, as depicted in our illustration. In the distance stand the Western towers, seeming more lofty than when viewed from the front; at the intersection of choir and transept rises the fine central tower, with its pinnacles, the octagonal Lady Chapel, the rich Eastern window, the chapter house, &c.; all these are clearly seen. The chain gate or gallery over the road by the north transept (shown on the drawing of the west front) is a very interesting feature. It connects the chapter house with the vicar's close, a set of dwellings designed for the accommodation of vicars, clerical and lay.

It may be interesting to note the size of this cathedral. From east to west measures 385ft., and across north and south transepts, 135ft. It is but four feet longer than Lichfield, which is the smallest English cathedral. The greatest bishop of Wells was Jocelyn, who was among the signatories of the Magna Charta.

A New Baptist Chapel at Plymouth is to be erected from designs by Messrs. Wiblin and De Boinville, of Plymouth, by Mr. J. Paynter, of Plymouth. The new chapel, which will have a frontage of 38ft. 6in. on the North Road, is early Gothic in style. It will be built of brick, with stone dressings, and will seat 240 adults. The plans provide for one large central main entrance and one side entrance, both fronting on the main road. At the rear of the chapel will be two vestries, with lavatories and a back yard and entrance, and in the basement a boiler-house and store.

New Free Church for Cullen.—The foundation stone of a new Free Church at Cullen was laid recently. The style of architecture to be adopted is Gothic of simple Scottish character. The dimensions over the walls are 75ft. in length and 42ft. in width. On the right side there is to be a tower, 12ft. square and nearly 100ft. high, with four dials and bell. The prominent parts of the building will be of rustic freestone. Sitting accommodation will be provided for 410 persons on the ground floor and eighty in the gallery. The interior woodwork is to be of pitch pine.

Views and Reviews.

THE MYSTERY OF THE CATHEDRALS.

What is a reviewer to say of such an extraordinary farrago as this handsome volume, beautifully printed, illustrated with eighty-eight splendid photographs? In the first place, he must humbly confess that he does not know what the writer is driving at, so confusing and desultory is the method in which the subject is presented. So far as can be gathered, it seems to be an attempt to re-write the architectural history of the world from the fourth century onward. It seems that Early Christian, Byzantine, Romanesque, Gothic, Renaissance architecture are due to—what does the reader suppose? To a little trades' union located in the little island of Comacina, near Como. This Comacine guild, moreover, is identified with a collegium of Pagan or Imperial Rome, and apparently with Solomon's Temple, and with our old friends the Freemasons. And what is the evidence for this amazing thesis? It is this: all the architects of Western Europe at any given period were designing in one and the same style, therefore there must have been one and the same governing influence; therefore that influence must have been a guild. We would humbly suggest, on the same line of argument, that in England, Australia, Canada, and the United States just now people are speaking one and the same language; therefore there must be some mysterious guild—and why not the Comacine Guild or the Freemasons'—regulating, unbeknown to everybody, the grammar and literary style of every English-speaking country. The supposition seems to us quite as reasonable as that of the "Cathedral Builders."

Secondly, what are the methods by which the writer tries to establish this amazing theory? They are charmingly simple. Assume—without proof of any sort—that interlacings and crouching lions are the trade-mark of the Comacine guild; then you can attribute to the guild with certainty, as the writer does, every building where lions and interlacings occur; Early Christian churches at Rome, St. Mark's, Venice, S. Ambrogio, Milan, Worms Cathedral, Milan Cathedral, and why not the lions of Trafalgar Square and the common domestic basket of the Covent Garden porters? Thirdly, what are the authorities on which the writer relies? Among them bulks largely that ancient author, Mr. Thomas Hope, whose sympathy with the great Freemason myth endears him to the writer. Cattaneo is quoted only to be ignored and disregarded.

Lastly, what are the writer's own qualifications for the work; what knowledge of architecture does this big book show? Well, here are some choice specimens, culled at random. Page 1, line 5, "Romanesque architecture led to the Renaissance," which is as if I should say "The Elizabethan drama led to Alexander Pope." "In the thirteenth century the mixture of pointed with round arches is found contemporaneously in Italy, France, and England." This is indeed news It was vulgarly believed that the characteristic mark of French and English Gothic in the thirteenth century was the total disuse of the semi-circular arch. In the next paragraph we are told that Salisbury, Beauvais, and Laon were built in the fourteenth century; we had ignorantly supposed that Laon was built in the twelfth century; Salisbury and Beauvais in the thirteenth. On the next page we hear of "the glorious winged flights of the full Gothic of the Renaissance." One might as well talk of the glorious winged flights of the romanticism of Crabbe and Akenside. Here is another: "Just as the interior of S. Michele, Pavia, is the most perfect existing example of the classical form reduced by the Comacines to Christian use and symbolism, so is the façade as perfect a specimen of their mediæval-oriental decoration at this time as can be found." What can this mean? It is cruelty to set such a riddle in such hot weather. The mausoleum of King Pepin is stated to be in the crypt of S. Leno, Verona; it is not in the crypt at all, but in the open churchyard to the south of S. Leno. The writer knows of "very few church towers that are round except that of St. Apollinare in blasse near Ravenna." Why, there are several in Ravenna itself; and it is amusing to find a photograph of one of them, St. Apollinare Nuovo, later in the book. Really one feels a suspicion that the writer has visited neither Ravenna nor Verona. A valuable suggestion to archæology in general is that at Tournus is to be seen "the first step to the vaulted roof of the later Gothic buildings." Will it be believed that the vaults of Tournus are tunnel-vaults, and those set like the arches of Waterloo Bridge all down the nave? What can this extraordinary and almost unique arrangement possibly have to do with the intersecting ribbed vaults of Gothic? An equally valuable suggestion to English archæology is that Prior Rahere may have brought over Comacines with him from Rome to design St. Bartholomew's, Smithfield. We learn also for the first time that Anglo-Saxon architecture is the result of Comacines also, brought over in the seventh century by St. Wilfrid and Benedict Biscop. And, of course, they were there when the Irish round towers were built: exit the Phœnicians and enter the Comacines.

The whole hypothesis of the book rests on rotten foundations, on chronologies of Hope "whose judgment is unerring on all subjects connected with the Lombard style." S. Michele, Pavia, is an eighth-century church. The pulpit of S. Ambrogio, Milan, is of the sixth century; while "the atrium is indubitably of the ninth century." It never troubles the writer that these two great Romanesque churches are as advanced in style as the eleventh and twelfth-century churches of France, England, and Germany; and that if they are of the eighth century, Romanesque architecture actually stood still in Lombardy for more than 300 years. For there is but little difference between these churches and S. Pietro in ciel d'oro, which is certainly a twelfth-century church. Besides, the Longobards could no more have built such churches in the eighth century than could the Zulu Kaffirs to-day. The book is full of chronologies of equal worthlessness, drawn from authorities discredited long ago. Of critical knowledge of the subject the author has none. The preface states that the chief authority cited, Merzario, had to be rewritten, because he was "bewildering in his redundancy, confusing in his arrangement, and not sufficiently clear in his deductions." If the Italian was half as bewildering, redundant, confusing, and obscure as the writer of the "Cathedral Builders," I pity his readers with all my heart.

F. B.

"The Cathedral Builders: the Story of a Great Masonic Guild." By Leader Scott. Sampson Low: 1899.

IRON AND STEEL INSTITUTE.

ANNUAL MEETING.

The annual meeting of this Institute was commenced last Tuesday week at Manchester. The first paper read was on the Use of Finely Divided Iron Ore obtained by Concentrating Processes. The paper was originally written in Swedish by Professor J. Wiborgh, of Sweden, and was translated by Mr. Bauerman. Professor Wiborgh contended that by the introduction of magnetic and other methods of separation the power of enriching or improving iron ores by the removal of barren or undesirable constituents has been greatly increased, and by the use of such methods the waste in working, in the case of magnetic minerals, at least, can be considerably diminished. The advantage arising from such operations is, however, largely qualified by the circumstances that the product or concentrate is usually obtained as a comparatively fine powder, which limits its utility to the smelter when compared with that of similar or even poorer ores obtained in larger masses, and, therefore, the question of how such material can best be applied is now becoming of importance. Powdered iron ores obtained by concentration may be utilised in several different ways — namely, by direct addition to the charges in the blast-furnace, by agglomeration previously to charging in the blast-furnace, as a refining or softening material in the open-hearth furnace, for the production of sponge iron for use in the open-hearth furnace.

Magnetic Separators.

Mr. H. C. McNeill, in a paper on "Some Forms of Magnetic Separators and their Application to different Ores," said the first application of magnetism as an agent for the separation of a magnetic from non-magnetic substances was probably the permanent hand-magnet used in the machine-shop for separating iron or steel turnings, &c., from brass or gunmetal sweepings. Similarly, foreign oats and grain are freed from bits of iron wire, pieces of cutter blades, nails, needles, &c The railway companies and other large employers of horse labour have found it necessary to subject all the materials utilised for horse food, such as maize and oats, to rigorous mechanical and magnetic cleansing. With the introduction and wider application of electro-magnetism, not only have machines been devised whereby naturally magnetic iron ores are freed from admixtures of other minerals, but by a preliminary roasting in the artificial production of magnetic oxide of iron other ores may be rendered suitable for a magnetic separation treatment.

A New Casting Machine.

Mr. R. H. Wainford, of Stoke-on-Trent, then read a paper describing a new mechanical apparatus for casting sandless pig iron, in insulated moulds, so as to maintain a good crystalline fracture, equal to that of the pig iron made in sand pits, at a reduced cost of production. He said that none of the machines hitherto brought forward for the production of pig iron had really met the needs of iron-masters in this country. The great advantages of sandless pig iron were fully appreciated, but hitherto it had been impossible to obtain this iron unaccompanied by inferior results on fracture. The machine described by the author had been experimented with by Messrs. Palmer's Shipbuilding and Iron Company, and by Messrs. Bell Bros., the latter experiments dealing with Cleveland iron exclusively. The machine was capable of dealing with sixty tons of iron per hour, and the labour cost worked out to about ½d. per ton cast. Mr. Hawdon (Middlesbrough) thought the work could be done cheaper by this new method of casting than by hand labour. Mr. Cooper (Jarrow) said the work was very hard, and in the recent hot weather some of their men had fainted on the pig beds. It was work that no man ought to be put to when they could adopt a machine which at small expense could do the work effectually.

The Iron Industry in India.

A paper on the iron industry in the territory of His Highness the Nizam of Hyderabad was next read by Shamsul Ulama Syed Ali Belgrami, secretary to the Nizam's Government Public Works Department, railways and mines. India had always been the home of iron and steel manufacture, as was amply proved by the enormous slag accumulations scattered all over the country; and if her ancient appliances were too primitive to compete with the requirements of modern trade, there seemed no reason why, as a British dependency, English capital and English enterprise should not be forthcoming to utilise her great natural resources in ore, flux, and fuel, and restore her to her former position as one of the greatest iron manufacturing countries of the East. Nothing but English capital and modern appliances was required to establish a thriving iron and steel manufacture in the premier native State of India.

Major R. H. Mahon, R.A. (Cossipore), contributed a paper on "India as a Centre for Steel Manufacture." The object aimed at by him, he said, was to place before the Institute facts relating to the possibility of manufacturing at a profit iron and steel in India. If it could be shown that suitable materials could be collected and worked into steel at a given centre in India, and at a price not exceeding similar manufacture in Europe or America, it must then be conceded that such steel started in the markets of the East with an advantage equal to the freight charges on imported material. This advantage would never be less than 12s. a ton, and would rise at times to 18s. There was, however, to be deducted from this, the freight charges from the selected centres to other ports, but this deduction could not under any circumstances absorb the whole. India alone as a market was capable of taking a very large quantity of manufactured steel, and its requirements were certain to increase for a number of years. The conditions which appeared to offer the greatest prospects of success were the establishment of a steel works on a large scale capable of undertaking the whole or a large part of the requirements of India, both as to rails, sections, and plates, to be situated either on the Hooghly below Calcutta, or on the Mutlah river at or below Port Canning.

In the afternoon the members visited the Lancashire and Yorkshire Railway locomotive works at Horwich, the Barrow Steel Company's collieries, and the Wharncliffe Silkstone collieries. In the evening there was a conversazione and reception by the Lord Mayor and the Lady Mayoress in the Town Hall.

The Microscope in the Steel Industry.

On Wednesday the reading and discussion of papers was resumed in the Town Hall, Manchester. Mr. C. H. Ridsdale, F.I.C., F.C.S., read a paper on "Practical Microscopic Analysis for Use in the Steel Industries." He said that there was no such thing as a "best for all purposes" steel. It was impossible that a steel should be the very best for welding, and at the same time the best for forgings, or for electrical conductivity and for turning purposes. It would be to the benefit of both user and maker if the fullest particulars were always given as to the ultimate purpose and the treatment the material would have to undergo in the intermediate processes. Microscopic examination brought out clearly the vital fact that whilst at a blue heat steel was in a condition of peculiar receptivity or sensitiveness to retain in permanent form the effects of shock or work such as strains and cracks, yet distortion strains existed in all worked material at the time of working, but when worked hot they were dissipated by slow cooling, and were in most cases more or less fixed by chilling. The author went largely into the details of microscopic analysis, illustrated by plates and photographs of steel at various heats.

Pig Iron Fractures.

Mr. James Willard Miller's paper dealt with "Pig Iron Fractures and their Value in Foundry Practice." The author stated that the method of grading pig iron originated in Great Britain several hundred years ago. The art founded 240 years ago had not progressed much beyond its original lines. In the author's opinion the fracture of pig iron was a delusion and a snare, as there was not one man in ten who could distinguish by the fracture a pig of iron suited for car wheels from one fit for stove plates. The sooner grading by fracture was abandoned the better for all concerned. Chemical composition was the only true guide by which iron could be judged as to its quality and fitness for the purpose in hand. The greatest drawback to the practical application of chemistry in the foundry was that with iron cast in the sand in the ordinary way it was almost impossible to get specimens of uniform composition. But this difficulty would be entirely overcome when the old method of casting in sand beds, which had been but little improved since first adopted, is superseded by the more economical and rational method of mechanical handling.

The Chemistry of Iron.

The Institute then proceeded to consider a paper by Dr. A. Stansfield, the object of which was to show that carburised iron is when fluid a solution of carbon of iron, and that under certain conditions the solidified mass also forms a solid solution. Further, that these liquid and solid solutions obey the ordinary laws of solution which have been fully studied in the case of aqueous saline and organic solutions. The solution theory, therefore, he held, could be invoked to explain both the mode of solidification of carburised iron and the molecular changes that take place after solidification.

Steel in Relation to Heat.

Mr. Bennett Brough, Secretary of the Institute, then read a paper by Mr. A. Sauveur, of Boston, U.S.A., on "The Relation between the Structure of Steel and its Thermal and Mechanical Treatment." He said it had been conclusively shown that in the case of finished pieces of unhardened steel the smaller the grains of the metal the more ductile and tough it would be, and as the finest possible structure resulted from heating the metal about 30deg. above the point of recalescence, it was naturally to be inferred that every piece of finished unhardened steel, in order to be in the best possible condition, should be heated to that degree. For numerous reasons, however, such treatment could not always be applied, and the problem was further greatly complicated by the fact that thick pieces could not be furnished at a temperature uniform throughout, the differences of temperature between the central portions and the outside increasing rapidly with the cross-section of the piece. Uniformity of structure, and therefore of physical properties in all parts of a worked piece of steel, together with freedom from distortion caused by cold work, could only be secured by reheating throughout to the temperature indicated, and whilst such treatment, as already indicated, was impracticable in many cases, besides necessitating the use of pyrometers, it remained true that with a clear understanding of the effect of heat treatment and of the work upon the structure of the metal, each manufacturer had it in his power to improve the quality of his product. In the manufacture of costly pieces of steel, when a large output necessitating the highest possible speed of production was not the all-important and absorbing factor—in the production of armour-plate, for instance, and expensive forgings—the metal might be treated on scientific lines, and thus the highest efficiency would be secured.—A paper on

"The Construction of Steel,"

by Professor Campbell, of Ann Arbor, Michigan, was the last to be read. The author contended that steel must be regarded as a porous body, through the pores of which a liquid might be made to filter, provided the cohesion of the liquid is not too great. Oxysulphide of iron was such a mobile liquid that it would enter the pores of the steel and filter through, assisted only by capillary attraction. The results obtained by Professor Arnold showed that the passage of phosphides through steel was a case of true diffusion rather than a case of filtration, as with the sulphides. Dealing with the carbon, Professor Campbell held that the carbon formed with the iron a series of compounds which might properly be termed "ferro carbons," on account of their similarity in structure to hydro-carbons, and he stated that if further experiments succeeded in establishing the existence of "ferro carbons," it was proposed to take up the study of some of the other carbides in order to determine whether or not other series exist. In the afternoon the members visited the Manchester Ship Canal works and other places of interest in the locality.

On Thursday a visit was paid to Oldham, where the extensive engineering works of Messrs. Platt Brothers and Co. and Messrs. Lees and Co. were inspected. A visit was also paid by members of another party to the boiler works of Messrs. Galloway, Limited. On Friday the programme of the annual meetings was brought to a conclusion by a visit to Chatsford House, by invitation of the Duke of Devonshire.

The New Waterworks at Wishaw are estimated to cost close on £100,000, and satisfactory progress is being made with their erection.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"There must be work done by the arms, or none of us would live; and work done by the brains, or the life would not be worth having. And the same men cannot do both."—JOHN RUSKIN.

Parish Church, Heswell, Cheshire.

THE old church shown in our inset plate had long been with the exception of the nave and tower, in a state of serious dilapidation, until it was restored and partially rebuilt in 1879. The south chancel aisle was built at a later date in 1896 by Thomas Brocklebank and Petrina his wife, in memory of their daughter and the late Ralph Brocklebank. The chapel is built entirely of the Heswell red sandstone inside and out, the walls being very thick, giving a girth of over 6ft. to the jamb moulds of the windows. The roof is of oak, and the screen between the chancel and the chapel is of stone. The fittings are entirely of oak. The stained glass is the work of Mr. Kemp, as is also an elaborate iron screen. The brass work and hanging lamp of brass are by Messrs. Barkentin and Krall. The reredos is a very fine piece of oak work, the altar frontals being of Spanish silk needlework, and the picture of our Saviour in the reredos was painted by an old Italian master. The work has naturally been very costly and adds very much to the general effect from the body of the church. When this Brocklebank Memorial Chapel was built, the chancel was extended some 10ft., and since that time the vestries have been enlarged. Mr. J. Francis Doyle, of Liverpool, was the architect, and Messrs. John Thomas and Sons were the builders.

Jerry-Building.

JERRY-BUILDING is an evil which is not yet quite dead, and there is still occasion for vigilance on the part of municipal authorities and their surveyors. The jerry-builder who was such an adept at arranging that the drainage of a house should be as defective as it possibly could, using mud instead of mortar and broken bricks from some old building instead of new, is almost a being of the past. But still there are some builders left who put up houses in which shortly after their erection cracks from basement to roof and bulging walls may be seen, and evidences of the sinking of the foundations may also be observed. What can be done to entirely extinguish the species? The Yardley District Council has hit upon about the only effectual remedy. Whenever jerry-building of a flagrant character is proved, orders are issued for the destruction of the offending structure by house-breakers. This is drastic, but not too severe when the harm resulting from such buildings is considered.

Proposed Electric Lighting at St. Paul's.

IT WAS announced some time ago that an American gentleman, named Mr. Pierpoint Morgan, had offered to bear the expense (about £5,000) of equipping St. Paul's Cathedral with electric lighting, and that this offer was accepted. Since this announcement was made little has been heard of the proposal. The "Daily Chronicle" says that three things have happened. Firstly, experiments have been made with the electric light resulting not at all in its favour so far as St. Paul's is concerned; secondly, the Hooley presentation Communion plate has had to be paid for; and thirdly, the scheme of decoration adopted by the Dean and Chapter on the advice of Sir W. B. Richmond makes illumination by the electric light an artistic impossibility. The experiments, it should be explained, were conducted two or three years ago, before the decorations had reached their present egregious extent. Even then it was seen that the florid mosaics and gilt marking would not bear electric illumination if it were desired to maintain the massive, dignified lines of Sir Christopher Wren's great monument. The first and third objections we can understand, as there can be no doubt that the installation of electric light would throw into hideous prominence the gilded mosaics of the choir and dome; but we cannot see how the fact that the Hooley presentation Communion plate has yet to be paid for would interfere with the electric lighting installation if the money for it is to come from outside sources.

The Demolition of Woodlands, Bradford.

WOODLANDS has for some years been one of the most conspicuous landmarks of the north-west of Bradford, and its disappearance will be regretted by the residents in its neighbourhood. The house was built in 1886, from the plans of Messrs. Milnes and France, of Bradford, in the plain Gothic style then popular. The ground plan of the building is of an irregular "L" shape, the principal frontage, facing the south, having a length of 130ft., whilst the other arm of the "L," facing the east, but protected against high winds by some fine trees, has about the same length. The gates are fine examples of ornamental ironwork by Messrs. Skidmore, of Coventry. The estate, which consists of about thirty acres, will probably be offered for building lots.

A Remarkable Monument.

AMERICA has always been famous for its tall buildings and its tall tales. The city of Detroit now intends to build a statue 250ft. high in celebration of the bi-centenary of its existence. Cadillac, the founder of the city, is to be the subject of the statue. It is to be erected on Belle Isle, a small island in the lake just outside the city, and will really be a great building in the shape of a man. The feet and legs of this huge statue will be large enough to permit of several public entrances being built in them, and of the running of a number of passenger lifts.

A Question of Light.

AT last week's sitting of the Consistory Court of London, the rector and churchwardens of St. George's Church, Bloomsbury, petitioned Dr. Tristram, Q.C., Chancellor of the Diocese of London, for a faculty to sanction an agreement between them and Mr. Truslove, the owner of a building adjoining the church, in reference to the light admitted to the church through the windows on one of its sides, which light, they contended, would be somewhat interfered with by a new hotel which Mr. Truslove proposes to build. Mr. Truslove did not think the new building would diminish the light admitted to the church. He, however, had met the rector in an amicable spirit, and agreed that white glazed bricks should be used for the wall of the new hotel facing the church, and was willing to pay a rent of £1 a year for the use of the light, and to give £1,250 to be invested for the increase of the stipend of the rector and his successors. The Chancellor was satisfied that the agreement was a very fair one, and said he would sanction it by faculty.

The Temporary Bridge at Kew.

SOME time ago the openings for traffic under the temporary bridge at Kew had to be made wider. The result has been far from satisfactory. The central opening, instead of coinciding with the deep channel, is upon one side of it. The result of this was seen the other day, when a shoal pushed its head above water almost in the centre of the fairway from the main opening at low tide. The *Cardinal Wolsey* and the *Queen Elizabeth* were lying side by side for two or three hours opposite Kew, before they could proceed on their way to Hampton Court. The tug owners on the river say that the set of the currents induced by the peculiar construction of the bridge, when the flood water is coming down in the winter, will be such as to render it exceedingly dangerous to take barges through the bridge, and they may possibly be compelled to decline to take the risks. The designing of river bridges seems to be a difficult matter. River navigation does not appear to be one of the strong points of bridge architects. It will be remembered that some time ago the discussion of the merits of the design for Vauxhall Bridge caused a certain member of the Council of the Institute to exhibit what he thought was a better design. He was evidently not versed in the rules of river navigation, as he placed the bridge lamps over the piers instead of over the centre of the arches. The top of the piers of a bridge certainly seems the most natural place for the lamp, but if this was done only in one case and not in all cases, river travellers would have to remember which bridge was so adorned, so as to avoid colliding with the bases of the piers. The lamps are placed over the centres of the arches to serve as a guide to steer for.

The National Physical Laboratory.

THE realisation of the scheme for the establishment of a National Physical Laboratory is primarily due to two addresses delivered before the British Association in 1891 and 1895 by Professor Oliver Lodge, and the late Sir Douglas Galton respectively. A committee, of which Lord Rayleigh was chairman, was then appointed by the Treasury, and, after taking evidence, reported in favour of the establishment of a public institution for standardising and verifying instruments, for testing materials, and for the determination of physical constants. They further recommended that the institution should be established by extending the Kew Observatory in the Old Deer Park, Richmond, and that the Royal Society should be invited to control it and to nominate a governing body, on which commercial interests should be represented, the choice of the members of such body not being confined to Fellows of the Society. These recommendations were approved, and to give effect to them the Government undertook to ask Parliament for £12,000 for buildings, and for £4,000 a year.

The Hands that Control.

THE ultimate control of the National Physical Laboratory is placed in the hands of the Royal Society, but the constitution of the bodies which manage it directly can only be altered with the consent of the Treasury. These are an executive committee and a general board. The latter is a relatively large body, to which the executive committee must report annually, and to which it must submit its scheme of work for the next year. An essential feature in the constitution of the general board is that twelve of its members are nominated by six of the great technical societies—viz., the Institutions of Civil, Mechanical, Electrical, and Naval Engineers, the Iron and Steel Institute, and the Society of Chemical Industry. Six of these representatives of "commercial interests" are also to be members of the executive committee, which will ultimately consist of twelve ordinary and five official members, of whom the latter are the president of the Royal Society, the chairman of the committee, the Permanent Secretary of the Board of Trade, and the treasurer and one of the secretaries of the Royal Society. In the first instance, six members of the existing Kew Observatory Committee will also have seats on the executive committee, but their places will not be filled up when their period of office expires. Finally, it is in the power of the executive committee to appoint sub-committees to superintend particular departments or investigations. The members of these sub-committees need not necessarily be members either of the general board or of the executive committee.

Church Improvement at Arbroath.

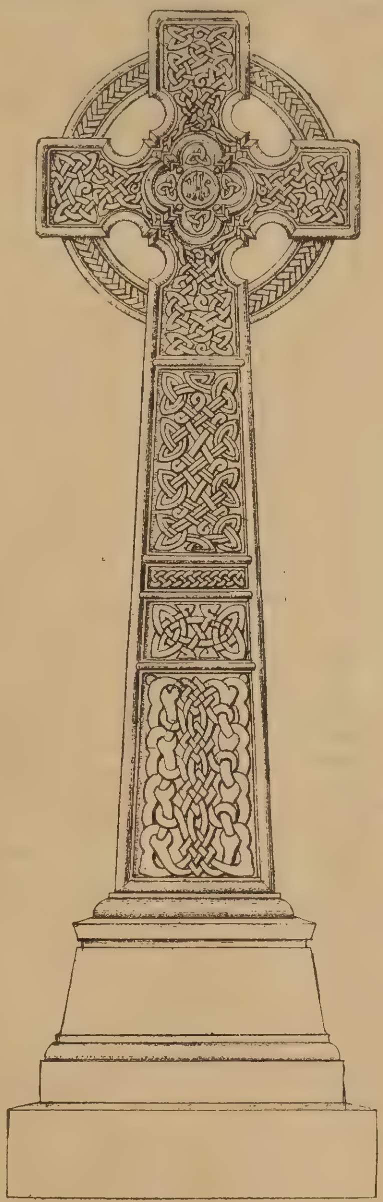
THE High Street Free Church, Arbroath, has undergone a considerable change during the last few weeks. Its walls were somewhat dark and dingy before they were put into the hands of Mr. A. C. Dargie's workmen; especially was the chancel recess in a bad state. The chancel has been artistically painted in an admirable design. The back wall is divided into three panels of reddish-brown, with ornamental bands above, underneath which it is intended to inscribe appropriate texts. The arches and mouldings and the four pilasters of the chancel have been done in a fine tone of light grey, while the upper walls of the chancel proper and the arches are of a pale bluish green; underneath the white mouldings the prevailing colour is dark blue green, relieved at the top and immediately under the mouldings with an ornamental band. The side walls of the church and the end wall above and below the gallery are done in pale yellow and light green, with a buff frieze under the cornice. The ceiling has been painted in pale buff and coloured cream, while a thread of red runs through and relieves the cornice. The gaslight reflectors in the roof have been painted white, with effective gilt edging. The front of the gallery is in yellow-brown, and unrelieved by ornamentation, while the lobby has been done in warm buff colour. The lobby floor has been laid with ornamental tiles, and one of the stone arches at the side of the church outside has been renewed, while the entrance outside doors have also been renewed.

St. George's Church, Liverpool. ST. George's Church, at the top of Lord-street, Liverpool, is undergoing demolition, and the workmen have just come upon a curious relic of bye-gone days. The church stands on the site of a baronial castle said to have been first built by Roger de Poictiers in 1073. After being used for various purposes, the castle was demolished early last century to make room for the church. While at work last Tuesday week the demolishers of the church came upon a large slab in the east aisle, immediately under the stained-glass window facing Lord Street. The slab on being raised disclosed twelve steps cut in rock and leading to a platform, and an arched doorway led to a flight of five steps, at the foot of which was a square chamber about 14ft. in height, also cut in the rock. From this place there is a passage apparently running in the direction of the river, while marks on the walls suggested that the tide flowed in at high-water, though the church is on a high level, and nearly 200yds. from the river. It is supposed that these steps and passages were hewn in the rock to provide an outlet from the castle near the waterside, and that when the castle was removed it was thought easier to cover the entrance than to fill up the passages. Foul air prevented the workmen from exploring further.

Wren's Alcove. Now that Kensington Palace has been restored, why should not the alcove which used to stand in the gardens, facing the south front of the Palace, be brought back to its original position? The alcove is a fine specimen of the stately architectural decoration of gardens which prevailed in the time of Queen Anne. At present it stands by the broad walk between the fountains and Bayswater Road. It is of red brick and stone, ornamented with Corinthian pilasters, and surmounted by a heavy pediment. The keystone bears the cypher of Queen Anne, and the structure is believed to be the work of Sir Christopher Wren. It would certainly look better in its true position, which is in the Dial Walk, the broad road which runs from the Palace to Kensington Gore.

Light. THE "Westminster Gazette" contained the other day an interesting little paragraph on the lighting of a room. It stated that although windows and open doors are, of course, chiefly responsible for the amount of light in a room, holes in the floor and ceiling may be safely depended upon to contribute their quota thereto as well. A good deal, however, depends upon the colour of the paper or other material selected for covering the walls. This, according to the percentage of light reflected thereby, will add to or detract from the darkness of a room in certain fixed proportions. The following table of the different percentages of light reflected by the materials chiefly in use for painting or covering walls is gathered from the results of recent experiments on the subject by scientists: Mirror, 92·3; white paint, 70; orange, 54·8; light green, 46·5; light yellow, 40; blue, 30; dark yellow, 20; light red, 16·2; dark green, 10·1; dark blue, 6·5; black paper, 4·5; black cloth, 1·2; and black velvet, 0·4.

Design for Celtic Cross. THE design here illustrated is original, and may be called a modern adaptation of the ancient Celtic crosses to be found in different parts of Ireland, Scotland, Isle of Man, Iona, &c.



DESIGN FOR CELTIC CROSS. BY. T. W. AYDON, LEEDS.

This particular kind of ornamentation is without question of Irish origin, and distinct from all other styles of art in the civilised world; it was probably first used in the illumination of books, manuscripts, &c., and afterwards to carving in relief. According to reliable authorities, it was established and cultivated in Ireland from the fifth to the ninth centuries. Very few rules or principles are laid down for the guidance of artists in the making of patterns, anything that lends itself to interlacing being taken and adapted to suit the taste or fancy; ribbons, reptiles, birds, animals, hideously elongated and attentuated, and interlaced; fruit, flowers, and figures; sacred symbols and monograms are all admissible, and may by the ingenuity of the artist be formed in the most beautiful patterns of interlaced work. Instances are in existence which show clearly by a magnifying glass nearly 200 perfect interlacings of ribbon pattern in the space of one-quarter of an inch superficial. The design here given is a very beautiful example of this special class of cemetery memorials. It is the work of Mr. T. W. Aydon, who has for many years given special study to such work.

Another Street-Cleaning Animal. IT will be remembered that in our issue of last week we gave some particulars of a machine in the shape of an elephant which was being tested for street cleaning purposes in Chicago. We foretold then that if the fashion spreads the streets of many of our great cities will resemble peripatetic zoological gardens, or parts of a circus parade. It seems likely that this will happen, as the latest American invention is a machine called the "electric goat." It is stated that it will carry away the rubbish that collects in the streets by means of "arms," which reach out and take up whatever comes within their grasp. We are waiting for the next animal machine; perhaps it will be the window-cleaning giraffe we suggested last week.

More Discoveries at the Tower. THE Tower of London is proving to be as fruitful in relics as the Forum at Rome, and recent discoveries have been supplemented during the last few days by others that are second only in interest to the relics supposed to belong to the period of Wyatt's rebellion. By the removal of a Georgian deal chimney-piece from one of the bedrooms in the Queen's House a beautiful specimen of a chimney-piece of the Tudor period has been exposed to view. The structure is of Gatton stone, and bears a number of inscriptions, most of which are, unfortunately, so defaced as to be almost illegible. The only word that can be easily deciphered is "Alpha." It is possible that these inscriptions might throw considerable light upon the history of the building. One of the walls of the apartment has been stripped of its plaster, and the old oak laths, crossing each other at regular intervals and closely bound together with straw, afford a good illustration of the art of the early builder. The initials and inscriptions, such as "Nosce te Ipsum," "Respice Finem," and "Oliver," that have been observed recently on the walls of Princess Elizabeth's walk, are also interesting. In connection with the most startling discovery, viz., that of the subterranean passage and dungeon, however, nothing further has yet been ascertained.

Artistic Honours in France. THE following have been created officers of the Legion of Honour: M. Raphael Collin, one of the finest artists of the French school; and M. Guadet, inspector-general of civil buildings, professor at the School of Fine Arts, architect to the Government, who was made Chevalier in 1878. M. Guadet took the Grand Prix de Rome in 1864, and a medal at the Salon of 1870. He obtained a gold medal at the Universal Exhibition in Paris in 1889, and during his brilliant career has exclusively devoted himself to the duties of Government architect. He was, in this respect, as first under-inspector of the New Opera, the collaborator of Charles Garnier, and he has successfully acted as architect on the Post Offices and the Palais Royal. In 1895 he was nominated inspector-general of civil buildings and of national palaces. The following have been made Chevaliers of the Legion of Honour: M. Agache, a painter who obtained a medal in 1885, silver medal at the exhibition in 1889, and is a member of the delegation of the National Society of the Fine Arts; M. Théodore Rivière, a sculptor, who obtained honourable mention in 1885, and medals in 1894 and 1895; M. Patricot, an engraver, who obtained the Prix de Rome in 1886, and medal of honour in 1898; and M. Vigneron, Commissionare Général of the Society of French Artists. M. Faure-Dujarrie, architect, has been made Officer of the Legion of Honour. He is the inspector of the sanitary services under the Minister of the Interior. He has been for a long time architect of civil buildings, and in this way has erected the School of Bridges and Roads and the School of Oriental Languages.

Professional Practice.

Bordesley, Birmingham.—The Imperial Theatre, in the High Street, at the corner of Clyde Street, will be opened on Oct. 2. The theatre has been designed by Messrs. Owen and Ward, Birmingham, and over £20,000 is being spent upon its erection. A façade, with turrets at either side of the building, fronts High Street on a site close to Bordesley Station. The frontage is 104ft. in height, and the elevation in Clyde Street 134ft. The High Street elevation is of red Ruabon brick with ornamental terra-cotta dressings, with a central figure representing "Liberty." The large hall is domed, and will be decorated by hand-painted panels illustrative of Shakespeare's works; the walls will be decorated with many colours, and the floor laid with mosaic marble tiles. The auditorium is divided into orchestra and pit stalls, pit, dress-circle, balcony, and gallery, and six private boxes, and the seating accommodation will be for 2,500 persons. The stage, which is on the most approved plan, and contains the most modern arrangements, is 69ft. by 40ft., a space in which the most elaborate productions can be properly presented. The scope allowed for scenic effects will be understood when it is stated that the "gridiron" is 50ft. from the level of the stage. Accommodation is provided for the artistes. There will be a commodious green room and ample dressing rooms, and other compartments will include large saloons, a cloak room, &c. Gas and electricity will be used in the lighting and warming of the building. Particular attention is being paid to the interior decorations, which will be principally in the Renaissance style, with the predominating colours of cream, blue and gold. An ornamental and glass verandah will be added to the front.

Felixstowe.—The foundation stone of the new Presbyterian Church to be erected at the corner of Orwell-road and Tomline-road was laid last week by Mrs. Lewis, Ph.D., of Cambridge. The exterior of the building will be of grey Kentish rag-stone with dressings of Bath stone. The prominent feature will be the south front, towards the main thoroughfare of the Orwell-road. A double-arched entrance porch, and a large window above, with traceried head, are grouped beneath a bold arched recess, which springs from the base to an imposing height, while other details are a turret (forming the entrance to the gallery) and massive buttresses. The side walls are arched over from buttress to buttress, each of the spaces between being pierced by three lancet-light windows. From the open entrance, draught-preventing lobbies give access to each aisle; on one side provision is made for a cloak-room, and the interior plan of the building is described as of the open area type, with transepts. The roof, which is to be spanned by moulded hammer-beam principals, with plaster between the rafters, after the old style, forms a prominent feature in the plan, the double purposes of utility and ornament having received careful consideration. There will be a gallery above the vestibule, this gallery being divided from the rest of the church by a bold arch, and the north end of the church will terminate in a short chancel, which is also to be arched over. The interior will be furnished with oak benches, and will provide seats for about 450 persons. The cost of the new church is estimated at about £3,300. The contractor for carrying out the work is Mr. F. C. Thurman, of Walton, and the mason is Mrs. Thomas Strong, one of a family who has been engaged in this special form of work ever since St. Paul's Cathedral was built. The architect is Mr. George W. Leighton, of Felixstowe and Ipswich.

The new chancel of the church of St. John and St. Felix was formally consecrated by the Lord Bishop of Norwich last Wednesday morning. Several other additions were also consecrated. The additions comprise a chancel, a south chapel, which is dedicated to St. Felix, two vestries on the north side, and an organ chamber above, approached by a special staircase from the choir vestry. The east end is throughout a replica of the east end of the church at Great Carlton, Lincolnshire. The reredos reveals a picture of the Lord's Supper, which is finely wrought in mosaic, and the representation is set in a massive framework of ornamental alabaster. On either side there is a large panel of green Irish marble, above this being more ornamental panels of glass mosaic, and in the space between the two is the text, "Peace I leave with you, My peace I give unto you." The lighting is by means of a three-light decorated window, and an excellent effect is produced on each side, by panel windows, which will in future be filled in with glass mosaics. The mosaic work above the altar table is by Messrs. J. Powell, of Whitefriars, London, and the floor of the chancel has been laid by the Rush Vitreous Mosaic Company, of Lambeth. The side chapel is lighted by a window at the east end, which is the gift of the local Lodge of Freemasons. It contains figures of three East Anglian Saints, St. Felix being in the centre, with St. Fursey—the building monk, whose emblem is a model church—on the right side, and St. Edmund on the left.

Govan.—A new school, situated in Katharine Drive, was opened by the Rev. Mr. Smith last Friday. The main entrance of the school buildings faces Katharine Drive, with Hutton Drive on the east, and an unnamed public street on the west. The main building is three storeys high, built of Corncockle stone, and is designed in the Roman classic style in an exceedingly plain but dignified manner. The face of the walls between the window dressings and the rustic corners and cornices is treated with red rock ashlar, over which the roof projects, and is supported by moulded consoles. There are three separate entrances to a large well-lighted central hall, around which there are wide balconies on each floor, with stairs at either end giving access to the several classrooms, of which there are twenty-one, with accommodation for 1,322 scholars. The windows are aptly arranged so as to diffuse the light equally over every part of the rooms. The playgrounds, in which are large covered playsheds, are laid with granolithic. In connection with the school there is a manual instruction workshop, with steam power, as also a cookery room, washing-house and laundry, with all the most modern appliances. The buildings, which were began in March, 1898, are from designs by Messrs. Bruce and Hay, architects, 261, West George Street, Glasgow, the measurers being Messrs. Dansken and Purdie, 241, West George Street, and have been erected under the superintendence of Mr. Samuel Preston, master of works to the Board. Mr. Roddie acted as clerk of works.

Great Easton, Essex.—The Bishop of Colchester recently officiated at the re-opening, after partial restoration of the building, of St. John's Church, Great Easton, near Dunmow, Essex. The portion completed comprises an entirely new dicular stone chancel arch, with a cambered oak rood-beam. The rood, which is supported by the beam, is 9ft. high, richly brattished, and with four panels for the reception of emblems. On the face of the beam are the words, in letters of gold, "God so loved the world." There are also a richly-carved oak altar with painted panels, a new stone font, brass lectern, and oak choir stalls. The work has been executed from the designs and drawings of the architect, Mr. Richard Creed, of Finsbury-circus, London, E.C., by Messrs. Bell and Sons, Saffron Waldron. The modelling and carving were done from the architect's drawings and under his immediate supervision by Mr. Henry King, Mr. Gilbert Seale, and Mr. William Butler. The cost of the work done is £900, of which £340 is still owing, and a sum of about £1,000 is needed for completing the restoration.

New Buildings at Tooting.—Two blocks of four flats each are to be erected at Tooting from the designs by Mr. Theobald, of 26, Budge Row, E.C.

Keystones.

A New Theatre at Norwich is to be constructed according to plans by Mr. Ernest Runtz, of 10, 11 and 12, Walbrook, E.C.

A New Girls' School at Swaffham is to be erected from plans prepared by Messrs. Milne and Hall, of 77, Chancery Lane, W.C.

Lodge Moor Fever Hospital Extensions are to be carried out by Messrs. John Eshelby and Son, of Sheffield, whose tender for the work was £68,750.

The New Market Hall at Ilfracombe is to be erected at a cost of about £4,600. The plans, estimates and specifications were passed at a meeting of the District Council last Thursday.

South Lambeth Orphanage to be Enlarged.—The London and South-Western Railway Servants' Orphanage, South Lambeth, is to be enlarged, at a cost of £3,000, so as to enable nearly fifty more boys to be received.

New Buildings at Stratford.—New buildings are in course of erection at Stratford for the Forest and Victoria Laundry Company. The architect is Mr. Henry Poston, of 39, Lombard Street, E.C.

Mr. W. Ernest Havell, of 23, Moorgate Street, E.C., is the architect under whose supervision extensive alterations are being carried out at the residence of Mr. J. H. Lile, C.C., at 57, Russell Square, W.C.

A New Depot for the London Parcel Delivery Company is to be erected at Forest Gate from designs by Mr. Henry Poston, of 39, Lombard Street, E.C. He has also designed new stables for the Fulham depôt of the Company.

St. Paul's Schools, Walworth, S.E., are being renovated and altered at a cost of about £2,700, from designs by Mr. P. A. Robson, of Palace Chambers, 9, Bridge Street, Westminster, S.W. Messrs. Garrett and Son are the builders.

New Schools at Clapham.—A new boys', girls' and infants' school is to be erected at St. John's, Clapham Rise, at a cost of about £2,500, by Messrs. Garrett and Son, from plans by Mr. P. A. Robson, of Palace Chambers, 9, Bridge Street, Westminster, S.W.

Public Schemes at Burnley.—A Local Government Board inspector held an inquiry at Burnley last Thursday into the proposals of the town council to expend £6,000 in erecting cold-air stores and ice-making plant, and £4,100 for various small street improvements, chiefly the widening of narrow portions of thoroughfares.

The Baths Committee of the Kidderminster Town Council have been instructed to go into the question of providing additional public bathing accommodation, which is urgently needed, and to bring up a report to the Council as to the accommodation to be provided at the proposed new baths, their estimated cost, the estimated cost of maintenance, &c.

Mr. William Simpson, R.I., who died on Thursday last, was one of the earliest special artist correspondents of the London illustrated Press. Born in Glasgow on October 28th, 1823, he was educated at Perth and Glasgow, being destined to follow the architectural profession. He, however, early turned from the pursuit of architecture to that of art, sketching and painting whenever opportunities occurred, and eventually settled on lithography as his vocation.

Samlesbury Church, Lancashire, is being Restored under the direction of Mr. James Berwistle, architect, of Blackburn. The restoration consists of re-roofing the church, filling in the old oak skeleton panels with oak boards, building two new porches, and erecting a tower at the north-west corner of the north aisle. A peal of eight bells will be hung, made by Messrs. Taylor, of Loughborough. The oak work is by Messrs. James Hatch and Sons, of Lancaster; and the building contract has been let to Mr. John Knowles, of Darwen.

The New School at Bannockburn, which has just been opened, has cost £3,400, and will accommodate 368 scholars. Mr. Ronald Walker is the architect.

A New Wesleyan Church for Wolverhampton, in Darlington Street, is to be erected at a cost of £10,500, from plans by Mr. Arthur Marshall, of Nottingham.

A New Wesleyan Chapel at Walsall is being erected at a cost of about £6,550. It is to seat 710 persons. The memorial stones were laid last Wednesday.

The Marble Statue of Professor Huxley, which Mr. Onslow Ford is executing, is practically completed, and is to be placed in the great Central Hall of the Natural History Museum at South Kensington.

The New Grammar School at Bridlington, Yorks., is being erected by Messrs. J. Thompson and Son, of Peterborough, from plans by Messrs. Botterill, Son and Bilson, of Hull.

Improvements at the Bermondsey Town Hall are to be carried out at an estimated cost of £10,000. The Vestry is asking for tenders for the alterations and additions, so as to enable a stage licence to be obtained from the London County Council.

A New Building in Coleman Street, E.C., has been erected from plans by Mr. Ernest Flint, A.R.I.B.A., of 80, Coleman Street. The new building consists of a block of offices running back to, and having another front in, London Wall Avenue. The front to Coleman Street is of Portland stone.

The Death of Mr. W. Beckley occurred last Tuesday week from cardiac failure. Mr. Beckley had been surveyor to the Brierley Hill District Council for over thirty years, and was prominently identified with many of the most valuable public improvements at Brierley Hill during that period.

A Life-size Bust of Mr. Gladstone was unveiled recently at Penmaenmawr, by Mr. Kneeshaw. The bust, which is of bronze, was designed by Mr. Albert Toft, of Chelsea, and stands on a massive obelisk and base of polished granite. The cost of the monument was £160.

The Anniversary of the Restoration of Scarborough Parish Church has just been held. The Bishop of Hull dedicated the chancel stalls and screens, which complete the work that has been carried out by instalments during the past few years in the chancel and the sanctuary, under the direction of Mr. Hodgson Fowler, at a cost of about £12,000.

Improvements at Whitkirk Church.—The Hon. Mrs. Meynell Ingram has offered £1,000 towards the cost of alterations and improvements in the old church at Whitkirk, near Leeds. Mr. Bodley has prepared plans for a new vestry and a large extension of the chancel. The church dates from the thirteenth century.

Tablets in the Blackwall Tunnel.—Two tablets are to be placed in the Blackwall Tunnel, one in memory of the seven men who lost their lives during the construction of the tunnel, and the other to mark the spot where the great steel shield used for compressed air ceased its work after boring a distance of 3,076½ft.

Bedlington New Masonic Hall was opened last Tuesday afternoon. The building is situated at the west end of the town, and has been erected by Messrs. Beattie and Maughan, contractors, at the instance of the St. Cuthbert's Lodge. The hall is 50ft. by 22ft., and has been specially arranged for masonic functions.

The New School at Thorpe St. Andrew, the foundation stone of which was laid last Thursday, is being erected from plans by Mr. A. J. Lacey. The site, which comprises a total area of about 2,700ft., will be utilised in the following manner:—Schoolroom, 38ft. 4in. by 22ft. 4in., cloakroom, 20ft. by 23ft., and commodious offices communicating. The building, which will be capable of holding seventy-five children, is expected to be completed in about three months; it is at the rear of the old schoolroom.

The Cottage Hospital, Dromore, co. Down, is being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

New Central Offices for the Warwickshire Miners' Union were opened last Saturday at Bedworth. A great demonstration took place, in which Mr. Woods, M.P., and Mr. Pickard, M.P., took part. A resolution in favour of the Miners' Eight Hours' Bill was passed.

"Helen Faucit" Memorial.—Sir Theodore Martin, K.C B., has intimated to the vicar of Stratford-on-Avon (the Rev. G. Arbuthnot) his willingness to give £1,000 for a memorial pulpit in Shakespeare's Church in memory of Lady Martin, the Shakespearian actress known as "Helen Faucit." The offer has been accepted, and Mr. Bodley, of London, will be the architect who will furnish a design.

Ribchester Roman Camp.—Recent investigations at Ribchester by Mr. John Garstang, a young Oxford student, have resulted in the discovery of the ruins of a Roman granary. Vast quantities of barley and wheat had apparently been reduced to charcoal, and this seems to confirm the story that Ribchester was sacked and burned by northern barbarians towards the close of the Roman domination.

The Renovation of Cairnie, N.B., Free Church has been carried out under the instructions of Mr. Thomson, of Fife, Keith. The seating arrangement has been altered, the flooring and joists have been renewed in certain places, the walls have been painted, and the woodwork has been stained and varnished. Mr. Christie, of Cairnie, executed the carpentry work, and Mr. Symon, of Keith, the painting and glazing.

Street Improvements and Gasworks at Malvern.—A Local Government Board inquiry was held before Mr. H. P. Boulnois, last Tuesday week, into the application made by the Malvern Council for permission to borrow £20,000 for remodelling their gasworks and £5,490 for street improvements. There was no opposition to the application. The period of the loan for the gasworks asked is forty years, and for street improvements thirty years.

Discovery at Athens.—An interesting archæological discovery is reported from the Promontory of Sunium, now known as Cape Colonna. During the recent excavations amongst the ruins of the temple there, the thirteen marble columns of which give the place its modern name, a stone was found with an engraved inscription which shows that the temple was dedicated, not, as was commonly supposed hitherto, to Athene, but to Poseidon. It would thus correspond to the Temple of Poseidon on the Island of Ægina, which lies over against Sunium.

The New Infectious Diseases Hospital at Pontefract was the subject of a Local Government Board inquiry last Tuesday week, when Dr. R. W. Johnstone investigated an application to borrow an additional £2,500 for purposes of the joint infectious diseases hospital for Pontefract and Knottingley. The hospital is already built, but the application had been rendered necessary by the difference between the original estimate and the lowest accepted tender, which accounted for £1,700, made up chiefly of an increase in the administrative block of £400, £200 for boundary walls, £750 for increase in the price of labour and materials, &c.

Vandalism of the Fourteenth Century.—Whilst removing the old lead flat round the base of the spire of St. Cuthbert's Church, Darlington, preparatory to repairs, on Tuesday last week, there was uncovered a perfect incised foliated child's grave cover, of the thirteenth century, measuring 2ft. 9in. in length by 13½in. wide at one end, tapering to 10in. at the other, and also the remains of another grave cover of the same date, measuring 18in. across the foliations. These two stones had been used to fill up the north-east squinch of the tower. This shows there was vandalism in the fourteenth century, when the belfry stage of the tower was built, between 1360 and 1375.

Whitworth Scholarships and Exhibitions.—The Committee of Council on Education have just issued the list of successful candidates in the competition for the Whitworth Scholarships and Exhibitions, 1899. The four scholarships of £125 a year each, tenable for three years, have been won by engineers of London, and of Horton, Bradford, and by students of Langside, Glasgow, and of Oldham. For the thirty exhibitions of £50 each, tenable for one year, W. T. S. Butlin, student of Bristol, T. E. Heywood, engineering student, Cardiff, and R. B. Matthews, engineer, Swansea, are among the successful.

A Bronze Statue of the Queen has been placed in front of the main entrance of the Albert Museum, Dundee, and will be unveiled by the Duke of Connaught next Saturday. The casting of the statue weighs 6 tons 15 cwt., the height of the bronze die is 4ft. 4in., and the height of the granite pedestal 9ft. The base course measures 21ft. by 19ft., and the complete monument rests on a platform of three steps. A rich Peterhead granite, effectively treated in two styles—fine axed and dull polished—has been used for the pedestal. None of the panels have been polished, so that full value will be given to the high lights of the bronze work.

Belfast Cathedral seems now in a fair way of being built. A contract has been entered into for the building of the greater part of the nave at a cost of slightly over £19,000. This portion will give accommodation for a congregation of about 2,000 persons. The committee have power, if funds are available, to complete the nave within three years by an additional expenditure of about £7,000. What is now about to be erected represents roughly a third of the entire cathedral. The amount of contributions paid and promised comes to over £16,000. The Countess of Shaftesbury will lay the first stone of the new building on September 6th; this will be the threshold stone of the great western entrance. The cathedral is to be of the Basilican type. The complete plan includes a central dome, transepts, and a chancel. The cathedral, whose nave and aisles will be 120ft. long and 88ft. wide, with an internal height of 80ft., will accommodate 4,000 people, and will be larger than any other Irish cathedral.

The Annual Excursion of Messrs. Young and Marten's Employees on Tuesday the week before last was a very enjoyable affair. About two hundred members of the firm went to Margate by "La Marguerite," and shortly after their arrival at that breezy place sat down at the Terrace Hotel to a cold collation which had been provided by the firm. The usual toasts were proposed and suitably answered, "The Firm" being replied to at some length by Mr. E. C. Montague Edwards, who presided at the tables. During the course of his remarks, he made mention of an excellent scheme for the benefit of the employees of the firm. He said a workman sooner or later reaches what may be termed his commercial value, *i.e.,* he reaches the highest wage that the firm can pay him, nor could he possibly obtain any increment elsewhere in the trade. In order that he may augment that figure the bonus scheme will be put into operation, and if by his energy and diligence he with other employees is able to do so much good for the company that a dividend of ten per cent. can be declared upon its ordinary share capital, then he will receive five per cent. upon his wages. Say, for example, a man gets £2 per week, or £104 per year, the bonus would be £5 4s. This of course will not apply to every section of the company's employees: there are some heads of departments who are not paid by results who will have a double portion. The carmen, labourers, loaders, and those of a similar grade will also enjoy the privilege of participation, but upon a lower basis than the salesmen and heads. Naturally they will need to prove to the directorate that they have used their best endeavours in the interests of the firm. The artisans who are paid by the hour or piece work do not participate so far as we have gone at present, but those taking an ordinary weekly wage may share in this new scheme.

Correspondence.

AN OPINION ON OUR COMPETITION.

To the Editor of The Builders' Journal.

Kilmarnock.

Dear Sir,—Allow me to congratulate you on your most interesting and successful feature, "The Builders' Journal Competition," just closing in your paper.

I have followed it with pleasure, and as an entire outsider have been much struck with the (in my opinion) justness of the awards. Further, as I see suggestions are permitted in your columns, is it not possible to have a reprint of the result of this competition, giving the entire literary matter and illustrations? Such a venture, I am sure, would meet with success.—Yours truly, H. S.

[We are obliged to H. S. for his kind expressions. But as regards the suggested reprint, we do not think this is necessary, as all the numbers of the Builders' Journal containing the illustrations and letterpress referring to the competition are still obtainable. The conditions were announced in the issue for May 10th, the assessor's report appeared on July 12th, and some of the designs submitted were reproduced in the numbers dated July 5th, 12th, 19th, 26th, August 2nd and 16th. A further selection of the competitive designs will be published at short intervals.—Ed. B.J.]

The Morecambe Sewerage Scheme has been sanctioned by the Local Government Board, which has given the Council permission to borrow £62,500 for the purposes of the scheme, on condition that the sewage shall not be discharged one hour before or till one hour after high water.

Co-Operators' Festival.—A great co-operative festival was held last week at the Crystal Palace. At the concluding meeting held last Saturday the Chairman, Mr. E. Owen Greening, stated that the co-operators now number 25,000,000—a community in which there are no paupers and few dependents, and in which crime is almost unknown.

A New Court at the Royal Courts of Justice.—Arrangements have now been made and plans are in course of preparation for the creation of a new Court at the Royal Courts of Justice for the use of the additional judge of the Chancery Division, who will shortly be appointed. It was at one time thought it would be necessary to go outside the building (probably to the new Bankruptcy Court adjacent) for the purpose, but space has now been found available for the erection of a large and commodious court within the Royal Courts of Justice. The work in connection with the new court is expected to be commenced very shortly.

The Housing Question.—A great labour demonstration was held in Hyde Park last Sunday, at which the following resolution on the housing question was put from each of the ten platforms:—"That we, the organised workers demonstrating in Hyde Park, emphatically express our condemnation of the majority of the London County Council and other municipal bodies authorised by Part III. of the Housing of the Working Classes Act (1890), for neglecting to avail themselves of the powers conferred, believing that a more general exercise of those powers would have counteracted many of the evils incurred by excessive competition for house room, resulting in rack-renting, disease, and death consequent upon the overcrowded and insanitary conditions under which the workers are compelled to exist. And we further demand the immediate introduction of a Bill giving greater and more extensive powers to the various municipal authorities, in order that they may more effectually grapple with this serious and growing evil. We also demand the establishment of a Rents Court for dwelling houses on similar lines to the Land and Rent Courts of Ireland and the Highlands of Scotland."

New Companies.

Chesterfield Brick Company, Limited.

This company was registered on Aug. 4th, by Messrs. Wynne and Co., 10, New Court, Lincoln's Inn, W.C., with a capital of £3,000 in £1 shares, to acquire the business of the Inkerman Brick Co., and to carry on the business of brick and tile manufacturers, &c. The first directors (to number not less than three nor more than seven) are Messrs. J. Knowles, W. Facer, J. Burcher, and J. Ashmore. Qualification, £25. Remuneration as fixed by the company.

W. A. Millard and Company, Limited.

This company was registered on August 5th, by Messrs. Waterlow and Sons, Limited, London Wall, E.C., with a capital of £2,000 in £1 shares, to adopt an agreement with Mr. Walter A. Millard, of Leeds, for the acquisition of the business now carried on by him, and to carry on the business of joiners, builders, &c. The first directors (to number not less than two nor more than five) are Messrs. Lewis Motley (chairman) and Walter A. Millard. Qualification, £10. Remuneration as fixed by the company.

Liernur's Scandinavian Syndicate, Ltd.

This company was registered on July 4th, by Mr. J. A. Vernon, 20, Wood Vale, Forest Hill, S.E., with a capital of £1,200 in £10 shares, to acquire the benefit for Sweden, Norway, and Denmark, of an invention relating to pneumatic sewerage, and to adopt an agreement with Messrs. F. Liernur and W. P. Liernur. The first directors (to number not less than two nor more than seven) are Messrs. J. Jorgensen, W. M. Johnsen, W. P. Liernur, J. S. Wood, and R. J. White. Remuneration as fixed by the company. Registered office: 5 and 6, Bury Court, St. Mary's Axe, E.C.

Dixon and Co., Limited.

This company was registered, on Aug. 3rd, by Mr. W. H. Cate, 32, Bouverie Street, E.C., with a capital of £1,000 in £1 shares, to acquire the businesses carried on by Mr. I. R. Dixon, as the Builders' Supply Co., and Mr. I. Richmond Dixon, at Cavendish Road, West Didsbury, Lancashire, and to carry on the business of builders' merchants, builders, &c. The first directors (to number not less than three nor more than five) are Messrs. Fred Hughes, Frank L. Bentley, and Richard A. Speke. Qualification, £10. Registered office, Cavendish Road, West Didsbury, Lancashire.

Edge, Malkin and Company, Limited.

This company was registered on August 8th, by Messrs. Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £35,000 in £1 shares, to acquire the business now carried on at Burslem, Staffordshire, by Messrs. William M. Edge, William S. M. Edge, and Samuel W. Dean, as Edge, Malkin and Co., and to carry on the business of china, glass, pottery, and terra-cotta manufacturers. The first directors (to number not less than three nor more than five), are Messrs. W. M. Edge, William S. M. Edge, and Samuel W. Dean. Qualification, £1,000. Remuneration as fixed by the company. Registered office: Newport Pottery, Burslem, Staffordshire.

Higher Antley Brick and Tile Company, Limited.

This company was registered on August 1st, by Messrs. Davidson and Co., 10, Old Jewry, E.C., with a capital of £50,000 in £1 shares, to adopt an agreement made by this company with Mr. W. R. Warner for the acquisition by purchase or otherwise, as a going concern, of a business with a similar title (not limited), as now and hitherto carried on at Accrington, Lancashire, and to develop and extend the same; and, generally, to carry on in all or any of their respective branches the businesses of manufacturers of and dealers in bricks, tiles, pipes, pottery, plasters, cement, gypsum, china and terra-cotta, earthenware clay, fire-clay, ceramic ware of all kinds; as quarry masters, coal owners, lime burners, paviors, and manufacturers of and dealers in artificial stone for building, paving, or other purposes; to acquire and turn to account any patents, patent rights, and inventions, real and personal property, farmers and graziers, suppliers of gas, water, and electricity, the business of a guarantee company, as company promotors, bankers, financiers, and concessionnaires, &c. The signatories (each one share) are: Messrs. P. E. Harding, C. J. Wilson, F. D. Leslie, J. A. Findley, R. M. Clarke, F. S. Pine, and R. Dowson. The first directors (of whom there are to be not less than three nor more than seven) are to be elected by the signatories. Qualification, £100. Remuneration: Chairman, £150; ordinary directors, £100 per annum each, with a percentage of the profits, divisible.

New Patents.

The following abridged description is specially drawn up for the Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, from whom all information relating to Patents, Designs, and Trade Marks may be obtained free of charge.*

8918. Bricks and Tiles.—Patentee: G. Dore, of East Street, Rhayder, Radnor, Wales. The front of each brick has a lip which rests on the top of the brick below it and keeps water from the joint. The ends of the bricks are bevelled and have flanges for forming butt joints on their front faces.

8786. Stays for Doors and Windows.—Patentee: W. Youlten, of Victoria Street, Westminster.—Relates to a stay for casement doors and windows. The stay is pivoted at one end to a plate secured to the casement. The other end of the stay, as the casement is closed, passes into a mortise in the hanging jamb. The casement may be fastened in any required position by a sliding bolt which is pushed into one of the holes in the stay. Nearly the whole opening between the sides of the frame of the casement is left clear with this arrangement.

8816. Floors, Ceilings.—Patentee: J. Feketehazy, of Buda Pest, Austria. Main girders constructed of concrete or cement, with metal bars and tie-rods embedded therein, are first built in between the walls or other supports. The ceiling or lower part of the floor is then constructed of cement or concrete about wire netting, and the main portion of the floor is afterwards laid on frames so as to leave a central space for heating appliances and ventilation. After the concrete of the semi-arches has set, the centering frames are removed through the central aperture, which is closed in by plates. The tensile stresses are taken up by wire netting embedded in cement, and the ceiling and any heavy objects, such as chandeliers, may be suspended from the concrete arches. Partition walls may be built on the arches or girders.

Aberdeen Graving Dock. — Aberdeen Harbour Commissioners resolved at a meeting on Monday week to authorise the engineer to take down and rebuild a portion of the north wing wall at the entrance to the graving dock, as it is in danger of collapsing. The engineer estimates the cost of the repairs at £380, and considers they will be sufficient to stand with safety until the work of reconstucting the dock necessitates the removal of the wall.

CURRENT PRICES.

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ...	per cwt.	1 5 8	1 16 2
Colza Oil, English ...	per cwt.	1 3 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 8 9	1 9 0
Linseed Oil	per cwt.	1 1 3	—
Neatsfoot Oil	per gal.	0 2 6	0 4
Petroleum, American ...	per gal.	0 0 6¼	—
Do., Russian ...	per gal.	0 0 5¼	—
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 5 0	1 7 3
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 5 9	—
Glue	per cwt.	1 14 0	2 18 6
Lead, white, ground, carbonate	per cwt.	0 19 0	—
Do. red	per cwt.	0 17 3	—
Soda crystals	per ton	2 15 0	—
Shellac, orange	per cwt.	8 4 6	8 5 0
Do. sticklac	do.	2 2 6	2 15 0
Pumice stone, ...	do.	0 8 9	—

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ...	per ton	76 0 0	—
Iron, bar, Staffs. in London	do.	8 10 0	9 0 0
Do. Galvanised Corrugated sheet ...	do.	13 0 0	13 10 0
Lead, pig, Spanish ...	do.	15 0 0	—
Do. English common brands	do.	15 3 9	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	16 10 0	—
Do. pipe	do.	17 5 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 0 0	10 0 0
Do. floor brads	do.	8 15 0	9 15 0
Tin, Foreign	do.	142 2 6	142 12 6
Do. English ingots ...	do.	143 10 0	—
Zinc, sheets, English ...	do.	140 0 0	28 10 0
Do. Veille Montaigne ...	do.	31 0 0	—
Do. Spelter	do.	24 5 0	24 12 6

TIMBER.

Soft Woods.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	do.	4 0 0	6 10 0
Deals, Archangel 2nd & 1st	per P. Std.	10 10 0	—
Do. do. 4th & 3rd.	do.	12 0 0	12 5 0
Do. do. unsorted	do.	12 5 0	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	10 10 0	16 0 0
Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	10 0 0	10 15 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	9 5 0	16 10 0
Do. White Sea	do.	12 5 0	—
Do. Quebec Pine, 1st...	do.	18 0 0	19 0 0
Do. do. 2nd	do.	12 0 0	—
Do. do. 3rd &c.	do.	7 15 0	9 15 0
Do. Canadian Spruce, 1st	do.	9 0 0	10 5 0
Do. do. 3rd & 2nd	do.	6 5 0	7 15 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	6 15 0	8 5 0
Flooring Boards, 1 in. prepared, 1st	per square	0 9 6	0 12 0
Do. 2nd...	do.	0 8 9	0 10 9
Do 3rd &c.	do.	0 8 9	—

Hard Woods.

		£ s. d.	£ s. d.
Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4	0 0 4½
Do. Honduras	do.	0 0 3½	—
Do. Tobasco	do.	0 0 4¾	0 0 5½
Elm, Quebec	per load	4 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 4 7/8	—
Do. African ...	do.	0 0 3½—4 5/8	
Do. St. Domingo ...	do.	0 0 5 9/32	—
Do. Tobasco ...	do.	0 0 4 15/16—6 1/32	
Oak, Dantzic and Memel	per load	3 5 0	3 5 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	8 15 0	13 15 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 2 6	0 4 2

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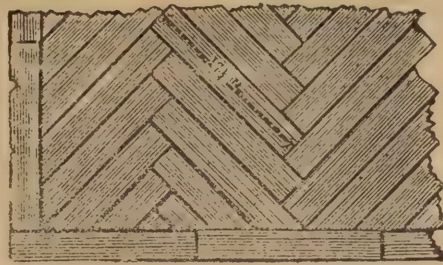

Per 100 Blocks out of sizes.	YELLOW.		PITCH PIN
	At Wharf.	ex Ship within one month.	At Wharf.
17½×3×3	12 7	11 3	16 6
17½×3×2	8 10	8 0	11 8
17½×3×1½	6 9	6 1	9 1

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With Special Joint to conceal Nails—
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1 ×4½ ,, 42/6 ,, 21/- ,,
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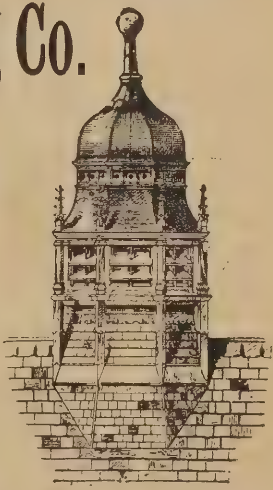

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LONDON OFFICE HAMBRO' WHARF, UPPER THAMES ST. E.C. BURNLEY LANCASHIRE.

COMING EVENTS.

Thursday, August 24.

CUMBERLAND AND WESTMORLAND ANTIQUARIAN AND ARCHÆOLOGICAL SOCIETY. — Second meeting of the season at the Globe Hotel, Cockermouth. Visit to Workington Hall.

Friday. August 25.

CUMBERLAND AND WESTMORLAND ANTIQUARIAN AND ARCHÆOLOGICAL SOCIETY.—Visits to Bridekirk, Peil Wyke, Hewthwaithe Hall, Wood Hall, and various other places of interest. Start 9.30 a.m.

Saturday, August 26.

EXHIBITION OF WORKS OF ART AT KENDAL.—Last day.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—Western District Meeting, Portland.

Tuesday, Aug. 29, to Saturday, Sept. 23.

SANITARY INSTITUTE. — Eighteenth Congress and Health Exhibition at Southampton.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

ALDERSHOT.—For various alterations to "The Builders' Arms," Aldershot, for Messrs. Lascelles, Tickner and Co., Ltd. Mr. Wm. G. Jones, architect, Broadway, Woking :—

Martin Wells & Co. ...	£125 0	J. Hughes*	£89 17
W. Garland...	109 0		

*Accepted.

[All of Aldershot.]

BYFLEET.—For the erection of a detached house at Byfleet, Surrey, for Mrs. Alice Charles. Mr. Wm. G. Jones, architect, Broadway, Woking :—

Greenfield	£1,128	C. Horsell*...	£980
W. B. Young...	1,085		

*Accepted.

[All of Weybridge.]

BADSHOT LEA.—For various repairs to the "Crown Inn," Bagshot Lea, near Farnham, Surrey, for Messrs. Lascelles, Tickner, and Co., Ltd. Mr. Wm. G. Jones, architect, Broadway, Woking :—

Martin Wells and Co. ...	£150	J. J. Robins, Farnham*	£105
W. Garland	124		

* Accepted.

CHADWELL HEATH.—For alterations and additions to the "Greyhound" public-house, Chadwell Heath, Essex, for Messrs. Goodey. Mr. Henry Poston, architect, 39, Lombard-street :—

Brown and Kruse ...	£1,355	Todd and Co....	£1,200
Chas. Blyton	1,280	A. E. Symes	1,071

GATESHEAD.—For the execution of paving works, &c., West Park-road, for the Corporation, Mr. J. Bower, borough surveyor, Town Hall, Gateshead :—

Wm. Cumming ...	£790 13 11	G. E. Simpson, Newcastle * ...	£782 7 4

* Accepted.

CHERTSEY.—For various repairs, &c., to "The Coach and Horses," Chertsey, Surrey, for Messrs. Lascelles, Tickner, and Co., Ltd. Mr. Wm. G. Jones, architect, Broadway, Woking :—

J. Martin	£215	H. Plowman, Addlestone*	£198
G. Wells	210		

* Accepted.

FRIMLEY.—For various repairs to the "Rose and Thistle," Frimley Green, Surrey, for Messrs. Lascelles, Tickner and Co., Ltd. Mr. Wm. G. Jones, architect, Broadway, Woking :—

E. Kemp	£127	G. Finch, Frimley* ...	£104

* Accepted.

GRAYS (Essex).—For the erection of cottage homes for the Whitechapel Guardians. Mr. Christopher M. Shiner, architect, 3, Bond-court, E.C. Quantities by Mr. G. Silvester :—

Barker and Co., Ltd....	£15,678	Rons...	£14,600
W. Potter	15,500	Brown	14,480
Minter	15,300	Hammond	14,175
Wall	14,790	Davey	12,999
G. Sharp	14,758		

LITTLE ILFORD.—For the erection of new house and shop, Sixth-avenue, Little Ilford, Essex, for Messrs. Savill Bros., Limited. Mr. Henry Poston, architect, 39, Lombard-street, E.C. :—

G. J. Hosking	£1,823	Todd and Co....	£1,747
W. Gladding	1,788	Blyton and Sons	1,707

LONDON.—For halls and other improvements at the Gipsy-road School, West Norwood, for the London School Board. Mr. T. J. Bailey, architect :—

Martin, Wells, & Co.	£12 723	J. and C. Bowyer ...	£12,015
Johnson and Co., Ltd.	12,473	Smith and Sons, Ltd.	11,931
Kirk and Randall ...	12,436	Edwards and Medway*	11,629
Longley and Co	12,352		
F. and H. F. Higgs ...	12,298		

*Accepted.

LONDON, E.—For rebuilding the "Farrier's Arms" public-house, High-street, Stratford, E., for Mr. James Holden. Mr. Henry Poston, architect, 39, Lombard-street. Quantities by Mr. Henry Theobald, 48, Finsbury-pavement, E.C :—

Todd and Co.	£1,894	Gregar and Son	£1,592
Blyton and Sons	1,860	J. and H. Cocks	1,549
A. E Symes	1,853		

LONDON, W.C.—For alterations, &c., at No. 57, Russell-square, W.C., for Mr. J. H. Lile. Mr. W. Ernest Hazell, architect, 23, Moorgate-street, E.C. :—

Clarke and Mannoch ..	£1,690	Stevens Bros.	£1,396
Bristow and Sons ..	1,584	West Bros.	1,380
C. W. Patten	1,565	Norris and Sons*... ...	1,306

*Accepted.

LONDON, E.—For pulling down and re-erecting "Eastern Star" beerhouse and cottage adjoining, Brunswick-road Poplar, E., for Mr. H. J. Harrison. Messrs. Bradshaw, Brown and Co., architects and surveyors, Billiter-square-buildings, E.C.:—

Chafen & Newman	£2,187 0 0	T. H. Jackson ...	£1,891 0 0
F. & T. Thorne .	2,135 0 0	S. Haylett	1,686 10 0
Harris and Wardrop	1,950 0 0	Watts, Johnson, and Co.	1,642 0 0
		Bruce & Croom*	1,452 9 6

*Accepted.

LONDON.—For the Camden Theatre, High-street, Camden Town, N.W., for Messrs. The Camden Theatre, Limited. Mr. W. G. R. Sprague, architect, Fitzalan House, Arundel-street, Strand. W.C. Quantities by Mr. A. R. Henderson, surveyor, 47, Pall Mall, S.W. :—

Leslie and Co.	£29,325	Patman and Fotheringham	£26,465
McCormick and Sons	28,765	Wilkinson Bros.	26,400
Courtney & Fairbairn	28,500	Kirk and Randall ...	26,336
Howell J. Williams ..	28,275	W. H. Lorden and Sons	26,245
W. Scrivener and Co.	27,700	*Walter Wallis	25,858
C. F. Kearley	27,196		
Harris and Wardrop.	26,597		
F. and H. F. Higgs ..	26,500		

* Amended and accepted at £25,000.

LONDON.—For new warehouse and workshops at 8, George-square, Hoxton, N., for Miss Rosa M. Langmore. Mr A. R. Henderson, surveyor, 47, Pall Mall, S.W. Quantities by Mr. Gilbert W. Booth, F.S.I., 3, Adelaide-street, Charing Cross, W.C. :—

J. Vears and Co.... ...	£2,719	Walter Wallis	£2,197
W. H. Lorden & Sons	2,444	*William S. Beaton ...	2,109
Wilkinson Bros.	2,383		
Woodward and Co. ...	2,250		

* Accepted.

LONDON, N.W.—Accepted for additions, alterations, and new billiard-room to "Dunkeld," Arkwright-road, London, N.W., for Mr. D. J. Mackay. Mr. A. R. Henderson, surveyor, 47, Pall Mall, S.W. Quantities by Mr. Gilbert W. Booth, F.S.I., 3, Adelaide-street, Charing Cross, W.C. :—

J. Vears and Co.... ... ... £2,338

LONDON, E.—For proposed new depôt at Forest Gate, E., for the London Parcel Delivery Company, Limited. Mr. Henry Poston, architect, 39, Lombard-street, and Forest Gate :—

—	Stables and Warehouse. &c.	Boundary Wall.	Road Approach.	Total.	Credit Ballast.	Net Total.
	£	£	£	£	£	£
Kilby and Gayford ...	5,027	169	333	5,529	100	5,429
G. J. Hosking	5,039	147	358	5,544	132	5,414
Hall, Beddall and Co.	4,980	120	385	5,485	80	5,405
Mowlem and Co.. ...	4,790	130	363	5,283	114	5,169
Todd and Co.	4,709	142	326	5,177	90	5,087
Blyton and Sons	4,460	105	295	4,860	70	4,790*
Architect's estimate	4,600	100	300	5,000	100	4,900

* Accepted.

LUTON.—For the execution of private improvement works, Charles-street and St. Ann's-road :—

Charles-street.	
T. Free and Sons	£1,085 0
The Patent Victoria Stone Company, Bishopsgate-street Without*	1,060 7
[Surveyor's estimate ... £975.]	
St. Ann's-road.	
T. Free and Sons, Maidenhead*	£397 15 6
[Surveyor's estimate ... £336.]	

*Accepted.

NEWTON ABBOT.—For building reservoir, laying three miles water main, &c., for the Rural District Council. Mr. R. A. Rogers, surveyor, Union-street, Newton Abbot :—

Bell and Co.	£2,889	G. Hicks	£2,175
Mingo and Boone ...	2,776	Hawkings and Best,	
F. Drake	2,526	J. C. Adams	2,080
Burden and Co.	2,500	Teignmouth*	2,064
W. C. Shaddock	2,348	E. S. Ford	2,050
E. Pike	2,345		

*Accepted.

SUTTON-IN-ASHFIELD.—For the erection of school buildings, for the School Board of Sutton-in-Ashfield. Mr. J. P. Adlington, architect, Sutton-in-Ashfield. Quantities by the architect :—

Brown and Son... ...	£10,800	F. Lee	£9,450
J. F. Price	10,439	H. Shaw, Sutton-in-Ashfield (accepted)...	9,140
J. Hutchinson	9,720		

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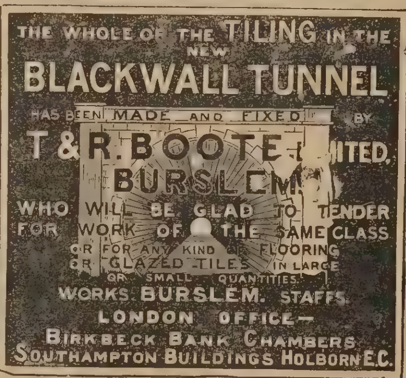

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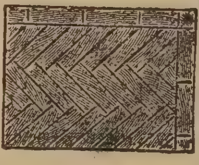

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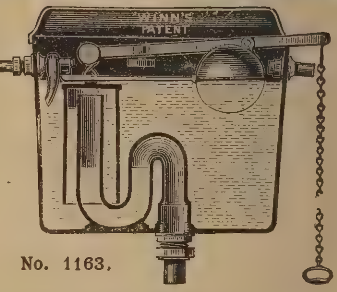

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TENDRING.—For the erection and completion of the new infirmary, nurses' home, &c., on the grounds adjoining the present union workhouse. Mr. Frank Whitmore, architect, Chelmsford:—

Shillitoe	£13,250	E. West	£10,937
Smith and Son	11,675	F. Thurman, Walton, near Ipswich*	10,799
E. Saunders	11,500		
F. Bennett	11,175		

*Accepted.

WOKING.—For alterations to "Goldsworth Hall," Woking, Surrey, for Mr. S. C. Knight. Mr. Wm. G. Jones, architect, Broadway, Woking:—

Ingram and Son	£299	G. Hooker	£285
J. Whitburn	297	Harris and Son*	278

* Accepted. [All of Woking.]

WOKING.—For the erection of shop and stabling, Guildford-road, Woking, Surrey, for Messrs. Lascelles, Tickner, and Co., Ltd. Mr. Wm. G. Jones, architect, Broadway, Woking. Quantities by Mr. John Scott, surveyor, 23, Bedford-row, W.C.:—

Ingram and Son	£2,031	G. Hooker	£1,885
A. A. Gale	1,957	Harris and Son*	1,847
J. Whitburn	1,923		

* Accepted.

[All of Woking.]

WOKING.—For the erection of a steam laundry at Maybury-road, Woking, Surrey, for the Godalming Sanitary Steam Laundry Co., Ltd. Mr. Wm. G. Jones, architect, Broadway, Woking. Quantities by Mr. John Scott, surveyor, 23, Bedford-row, W.C.:—

A. A. Gale	£12,090	Martin Wells and Co.	£9,800
Higlett & Hammond	11,073	Mitchell Bros.	9,570
F. Milton	10,475	Harris and Co., Woking*	9,350
Gregory and Co.... ...	10,200		

* Accepted, subject to revision.

WOLVERHAMPTON.—For pulling down Wesleyan church and erecting new buildings, Darlington-street. Mr. A. Marshall, architect, King-street, Nottingham:—

Henry Gough	£14,340	Cave and Sons	£12,9 0
Williamson and Co.	13,940	Willcock and Co. ...	12,450
T. Barlow	13,599	F. Lindsay Jones, Wolverhampton* ...	12,229
F. and S. Hum	13,460		
Fist and Sons	13,383		

*Accepted.

CONTRACTS OPEN.

TO BUILDERS.

TENDERS are invited for the CONSTRUCTION of NEW WESLEYAN CHURCH and SCHOOLS, at Sandgate, Kent.

Builders wishing to Tender may obtain quantities by applying to the Architects.

The time for delivery of Tenders to the undersigned has been extended to HALF-PAST ELEVEN a.m. WEDNESDAY, 6th SEPTEMBER, 1899.

The Trustees do not bind themselves to accept the lowest or any Tender.

GORDON, LOWTHER, and GUNTON,
Architects.

Finsbury House,
Blomfield-street,
London, E.C.

NEW ASYLUM for EAST SUSSEX.

TO CONTRACTORS.

The Visiting Committee of the proposed Asylum at Hellingly, near Hailsham, Sussex, are prepared to receive TENDERS for EXCAVATING and LEVELLING the SITE and for FOUNDATION WORKS for the New Asylum, in accordance with plans and specification prepared by their Architect, Mr. GEORGE T. HINE, F.R.I.B.A., of 35, Parliament-street, Westminster, S.W.

A copy of the specification and schedule may now be obtained from the Architect on payment to me of a deposit of £5, which will be returned on receipt of a bonâ-fide Tender.

Sealed Tenders, endorsed "Tender for New Asylum Works," to be addressed to me, the undersigned, and delivered to me on or before MONDAY, SEPTEMBER 4th next, not later than SIX p.m.

The Committee do not bind themselves to accept the lowest or any Tender.

By order,
REGINALD BLAKER,
Clerk to the Visiting Committee.
No. 211, High-street, Lewes,
August 9th, 1899.

CITY of BRISTOL.

TO BUILDERS and CONTRACTORS.

The Finance Committee of the Corporation are prepared to receive TENDERS for the ERECTION of NEW OFFICES in Broad-street, Bristol.

Drawings and specifications can be seen at this office and bills of quantities obtained on deposit of a cheque value Two Guineas, which will be refunded on receipt of a bonâ-fide Tender.

Tenders must be made out on the form provided, and all blanks must be filled in, otherwise the Tender will not be considered.

Sealed Tenders, endorsed "Tender for Offices, Broad-street," and enclosed in the envelope provided, to be delivered before TEN a.m., FRIDAY, SEPTEMBER 1st, 1899, addressed to the undersigned.

The Committee do not bind themselves to accept the lowest or any Tender.

By order,
T. H. YABBICOM, M.Inst.C.E.,
City Engineer.
No. 63, Queen-square, Bristol.
March 16th, 1899.

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ENFIELD SCHOOL BOARD.
TO BUILDERS AND CONTRACTORS.

The Enfield School Board invite TENDERS for the ERECTION of a BLOCK of SCHOOLS at Chase Side, Enfield.

Applications for bills of quantities should be sent to the Architect, Mr. G. E. T. LAURENCE, 181, Queen Victoria-street, London, E.C. The plans and specifications can be seen at the above-named address. A deposit of One Guinea should accompany the application, to be returned on receipt of a bonâ-fide Tender.

Sealed Tenders, on the form supplied, must be delivered at my office, free of charge, not later than TWELVE noon, on TUESDAY, SEPTEMBER 5th, 1899.

Persons Tendering will be required to sign an undertaking to pay the rate of wages, and observe the rules adopted by the London Building Trades Federation, and to find two sureties in five hundred pounds each for the due performance of the Contract.

The Board do not bind themselves to accept the lowest or any Tender.

By order,
N. HEPWORTH,
Clerk.
School Board Offices,
Court House, Enfield,
August 17th, 1899.

GRAYSON'S
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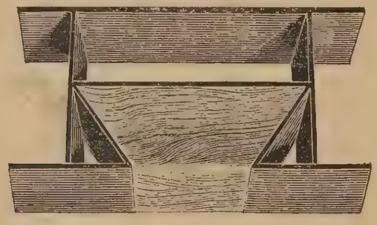

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TO SANITARY ENGINEERS and Others.

The Metropolitan Asylums Board invite TENDERS for CARRYING-OUT certain IMPROVEMENTS in the sanitary arrangements at the Leavesden Asylum, near Watford, Herts., in accordance with a specification prepared by the Board's Surveyor.

A copy of the specification and bills of quantities, together with a form of Tender (upon which alone Tenders will be entertained) may be obtained at the Office of the Board on and after FRIDAY, the 25th instant, upon a deposit of £5 in gold, or by means of a Bank of England note, which will be returned upon the receipt of a bonâ-fide Tender.

Tenders, enclosed in sealed envelopes, which must be endorsed "Tender for Sanitary Work, Leavesden Asylum," are to be submitted, with the bills of quantities fully priced and monied out, not later than TEN a.m. on MONDAY, SEPTEMBER 4th, 1899.

The Board do not bind themselves to accept the lowest or any Tender.

By order,
T. DUNCOMBE MANN,
Clerk to the Board.
Office of the Board,
Norfolk House,
Norfolk-street, Strand, W.C.
August 16th, 1899.

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COMPETITION. — ARCHITECTS and BUILDERS.

The Board of Public Works for the Island of New Providence, Bahamas, West Indies, invite Architects and others to submit DESIGNS and SPECIFICATIONS for a NEW PUBLIC MARKET, to be built of stone, brick, or iron, in the city of Nassau, New Providence, and the Board offers a premium of £40 for the design which shall appear to them to be most suitable for the purpose.

The Board will also pay £10 for the second best design, and £5 for the third best. The Board will be the sole judges as to the merits of the designs.

The design selected for the first prize shall become the property of the Board, and before the £40 will be paid, a full set of detail working drawings and specification shall be supplied by the person whose design shall be chosen.

The Board are at the same time prepared to receive TENDERS for the ERECTION of the MARKET, in accordance with any design submitted.

Full particulars and plan of the site may be had by addressing the CIVIL ENGINEER, Nassau, Bahamas, viâ New York, to whom also the designs are to be sent not later than NOVEMBER 30th, 1899.

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AUGUST 23RD, 1899.

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SANITARY INSPECTORS' CONFERENCE.

FOLLOWING the meeting of the Sanitary Inspectors' Association at Lincoln on August 3rd, and the opening of the Health Exhibition, reported in our last issue, the next day, Thursday, was devoted to the reading and discussion of a number of papers. Mr. H. K. Hebb first gave an account of the last thirty-three years' work in Lincoln under the Public Health Acts. Mr. G. M. Lowe, M.D., F.R.C.P.Ed., then treated of the action of sun and air in the

Purification of Surface Water.

He stated that absolutely pure water was unknown in Nature, and one of the chief properties of water to be considered was its power as a solvent, which is exercised in reference to gases and liquids as well as to many solid substances. Rain water is a very powerful solvent of certain ingredients of the soil, such as sulphate of lime, chloride of sodium, and magnesium salts, but when saturated with carbonic acid, as is ordinarily the case, its solvent properties are remarkably increased. Certain of the mineral constituents convey to water its *hardness*; these are salts of lime and magnesia. The sulphates, chlorides and nitrates of lime and magnesia, give to water its so-called *permanent hardness*, whilst the carbonates which are held in solution by excess of carbonic acid, impart to it its *temporary hardness*, or that which it loses by boiling. Dr. Lowe went on to say that the waters of rivers, from which the greater number of English towns obtain their supplies, contain the above-named mineral constituents in quantities varying according to the composition of the soil over which they flow. All river waters contain more or less organic matter, which is acknowledged to be a predisposing cause of disease. From a sanitary point of view it is necessary to consider the source of the organic matter, the nature of the decomposition it undergoes, and the means of destroying it, so as to render the water wholesome. A river is

The Natural Drain

of the country and towns through which it flows, and the organic matter its water contains must necessarily be derived from the sewage of towns, the surface drainage of manured and cultivated lands, and the decay of aquatic plants and animals. In a non-tidal, slowly flowing river the water comes into intimate contact with the various agents that tend to purify it, sunlight, air, and vegetable growth. Direct sunlight checks the multiplication of and ultimately destroys pathogenic bacilli (such as those of typhoid, cholera, and anthrax). It favours the decomposition of dead organic matter, especially of sewage origin, by a process of oxidation, possibly by ozone or peroxide of hydrogen, or both; and aquatic plants absorb carbonic acid gas, and give off oxygen, materially assisting in purifying water. The surface of water exposed to air and sun is enormously increased by the action of wind, which breaks it into waves, the superficial area in contact with the atmosphere being increased according to the amplitude of each wave. This wonderful laboratory of Nature is subject to variations as to the output and efficiency of its work. Thus, the action of light probably ceases during the night; in very swift rivers the amount of dissolved gases, such as oxygen, is less, owing to the pressure of the current; therefore, unless the surface of such a river is broken by falls or cascades, but little oxidation can go on. When the effect of both sun and air is cut off, as in the case of prolonged frosts, the natural purification of river water ceases, sometimes with disastrous results. Laboratory experiments often fail to corroborate the "evidence of experience," and sanitary authorities are frequently perplexed and led into useless expenditure by the too positive declarations of experts, one class declaring that no river is long enough to purify itself, and others pointing to notable examples of clarification, as at Munich, where the foulest sewage disappeared after two hours flow below that city. This practice has been explained by Dr. Koch, who investigated the recent outbreak of cholera at Hamburg and Altona; he reported that the comparative immunity of the latter town, which lies lower down the river than Hamburg, whose sewage passed untreated into the stream, was due to the effective filtration of the water. It is not a chemical, but

A Biological Question.

If the specific disease-producing bacteria can be carried long distances by streams, it matters very little whether they are accompanied by an increased or decreased amount of the soluble impurities which were introduced therewith. Biologists differ as widely as chemists in their views; some contend that a biologically impure water may, by a few miles flow, supplemented by a process of sand filtration, be rendered biologically pure, whilst others consider that the water of a river specifically infected at any point cannot afterwards be rendered safe for domestic purposes. But pathogenic (or disease-producing) bacteria are in an unnatural medium in water, and whilst the natural water bacteria increase rapidly in a water contaminated by animal manure, the former undergo rapid attenuation and loss of virulence, and being worsted in the struggle for existence speedily succumb. Direct sunlight also destroys these bacteria, and even diffused light reduces their vitality. During the process of sedimentation also a large proportion of the bacteria are deposited. Dr. P. Frankland has shown that in the process of softening water by the addition of lime, 98 per cent. of these organisms are removed in the precipitate. The action of free oxygen existing in water and of the nascent oxygen produced by acquatic plant life have to be investigated.

The successful elucidation of the problems of the purification of surface waters depends on a close study of Nature's methods. A knowledge of the physical properties of water and of the effects of sunlight, air, and plant life on its organic impurities, together with a bacteriological investigation of the local peculiarities of each district, is necessary to enable sanitary authorities to work with efficiency.

Mr. T. J. Moss-Flower, C.E., F.G.S., Chairman of the Association, read a paper on the

Sources of Underground Water Supplies.

The following are some of the chief points dealt with:

Regarding the relative wholesomeness and palatability of water from various sources, it may be well to refer to the Rivers Pollution Commissioners' report, which states as follows: "In respect to wholesomeness, palatability, and general fitness for drinking and cooking, our researches lead us to the following classification of waters in the order of their excellences, and founded upon their respective sources:—

" WHOLESOME	1. Spring water ...	Very Palatable.
	2. Deep-well water ...	
" SUSPICIOUS	3. Upland surface water	Moderately Palatable.
	4. Stored rain water ...	
" DANGEROUS	5. Surface water from cultivated land ...	Palatable.
	6. River water to which sewage gains access	
	7. Shallow-well water	

A Shallow Well

is one that does not pass through an impervious stratum to a water-bearing formation beneath, but is simply sunk into a surface stratum of gravel or other pervious formation, and obtains its water by the soakage into the ground of the water which falls within a comparatively short distance of the site of the well. A well is considered to be a "shallow" one, no matter what its depth may be, provided its supply is not furnished from a water-bearing formation lying beneath one or more impervious strata. With regard to shallow wells it is hardly necessary to say much in condemnation of them as the evils connected with this source of supply are well known. The author believes, however, that there are thousands of shallow wells in existence which form the only source of water supply to many thousands of people. Possibly under a certain set of conditions, which, however, seldom exist, a shallow well might give a supply of fairly good water, but never in populated districts, and generally it is far safer to condemn them outright whatever may be the existing physical conditions. The author has made a considerable number of examinations as to the cause of the water in certain wells becoming contaminated, and he has generally been able to trace the cause of pollution to there being within a comparatively short distance of the well either one or more of the following undesirable conditions, viz.:—Defective drains, sewers, cesspools, foul ditches or privies, which allowed their contents to percolate therefrom; accumulations of manure, decaying vegetation, and improperly paved barn yards. The remedy is to carry the well to a good water-bearing stratum below one or more impervious strata, and thus convert the "shallow well" into

A Deep Well.

The millstone grit is an admirable water-bearing stratum. The water from it is generally excellent and of very moderate hardness. Magnesium limestone possesses wonderful absorbing capacity, and may be said to be a good water-bearing formation. The water from it, however, is generally very hard and is often found to contain considerable quantities of calcium sulphate. Carboniferous limestones generally yield an abundance of water. The red sandstones are very excellent water-bearing formations, and many of the towns in this country draw supplies thence. The coal measures yield water of variable quality and hardness. Considerable quantities of iron pyrites are found in these formations and give the chalybeate qualities found in water obtained from this source. The hardness ranges from over 100 degrees in some cases to as low as 3 in others. The lower oolites rapidly absorb the rainfall, and in some cases yield an abundance of water of varying degrees of hardness. Many excellent supplies of water are obtained from the chalk. It must be borne in mind that all

Sources of Fresh Water Supply

have but one common origin, that is, the moisture which falls from the clouds. The amount of rainfall depends upon situation and elevation, and the springs upon geological characters. As to what percentage of a given rainfall is evaporated, or what percentage sinks into the earth or is returned to the sea, that depends wholly upon the particular physical conditions prevailing. The portion of the water absorbed is discharged in the form of springs, or, the conditions being favourable, is held by the water-bearing formations at various depths to form extensive subterranean reservoirs, which in many cases are practically inexhaustible. As to the quantity and character of the water to be found, so much depends upon the physical conditions existing, and the whole area from whence it is proposed to obtain an underground supply must be examined in great detail. All springs with their respective levels, and the water line in existing wells, should be carefully noted. Frequent borings should be made in case of doubt. The dip of the various strata, position of faults, and other geological disturbances likely to affect the planes of saturation, must be carefully ascertained. Of course, if circumstances permit, the site of the well should be arranged at such a level as would enable the water, after being raised from the well, to be supplied to the town by gravitation. The direction of the flow of

Underground Water

must be ascertained, and care must be taken in selecting the site of the well that it is not possible for anyone else to sink another well and rob the well first made of its water. The possibility of well-water becoming polluted has already been referred to, and in selecting a site for a well great care must be taken to see that the absorbing area or areas from which the well draws its supply are free from polluting agencies. The conditions affecting underground water supplies are subject to fixed laws, and when the physical conditions existing in any particular district have been thoroughly studied, the existence of springs, their depth from the surface, and the height to which they will rise can generally be, at least approximately, determined.

In case of a supply from deep wells the annual working expenses for pumping in many cases would be no more than the interest on the extra capital sum required to procure and manage large surface supplies. Among some of the advantages of a deep well supply it may be mentioned that impounding and compensation reservoirs are unnecessary; filter beds are not required, settling tanks can be dispensed with, though they are needed if the supply be taken from a river. The first cost is often much less than a surface supply would be, and, as there is no property in underground water, it may be much easier to get Parliament to sanction a deep-well scheme if a special Act were required.

Mr. Thos. G. Dee followed with a valuable paper on "Prevention of Smoke," which we shall publish next week.

Slaughter-Houses and Slaughter-House Inspection

formed the subject of a paper by Mr. G. Anderson, Chief Sanitary Inspector for Middlesex. He contended that slaughtering should be done in commodious, well-ventilated, well-appointed public abattoirs, under municipal management, and that the small, badly-constructed and ill-ventilated private slaughter-houses should be abolished. All slaughter-houses should be well-ventilated and drained, the inner walls should be lined with glazed bricks or tiles, and the floors should be laid with cement concrete, with a proper gradient to a blood hole. As this requires emptying by hand, a small iron set-pot, let into the ground, with wood cover is the best, and no room or loft should be constructed over a slaughter-house or lair. The cattle lairs in connection with the slaughter-house should be well paved, drained and ventilated, the inner walls should be covered with hard, smooth, impervious material, and lime-washed at frequent intervals. The most important advantages the author claimed for public abattoirs were: (1) That they practically guaranteed the inhabitants of a town a pure meat supply, and abolished the trade in diseased meat; (2) That they confined the nuisances and foul emanations inseparable from the business of slaughtering to one place, instead of allowing them to be spread over different parts of a town, as at present. (3) That they would banish from crowded districts the semi-public slaughtering now taking place, often in the presence of children, a state of affairs which must have a very unwholesome effect on the juvenile mind.

Mr. J. Skinner, of Brighton, dealt with the sanitation of dairy farms. The final paper was that of Mr. W. Watkin, F.R.I.B.A., on

Domestic Sanitation.

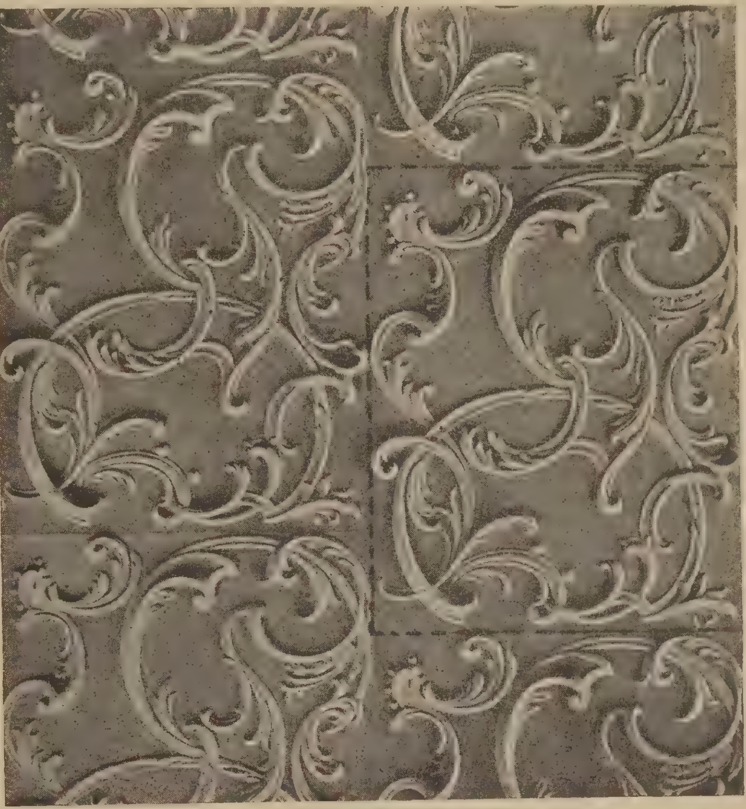
Among many fruitful causes of ill-health and disease the author mentioned that unpaved back-yards and badly-laid and leaky drains, admitting of the saturation of the soil under and around residences with polluted matter; open waste-pipes from sinks and lavatories, fouled inside with greasy matter, admitting foul air to the interior of the houses to be breathed by the unfortunate inmates; ventilating pipes from sewage drains stopped up with the falling rust of ungalvanised cast metal; unpaved pig-styes and ash-pits filled with putrifying matter, and manure-pits in a foul condition, often within a few feet of the doors and windows of the house. And if we add to these the carefully stopped-up fire-places and pasted-over ventilators of bed and sitting rooms, and the ever-to-be-condemned "dead wells" or "sewage cesspools" so persistently provided for in the building bye-laws of county and district councils, and required by them to be constructed to every house and cottage within their jurisdiction, where no system of public drainage exists, we have a catalogue of the evils the amelioration of which will tax the energies of the sanitary inspectors for many years to come. Sanitation does not begin and end with drains nor with the polluted soil under and around our houses, but extends, amongst other things, to the sanitary appliances with which buildings are fitted up. Of these, as is usual in such matters, the simplest and least complicated are the best. Each case should be treated on its own merits; and as an architect designs the main structure, so he should lay down a complete system of sanitary appliances for all buildings entrusted to his care; no pipe should be embedded in walls or ceilings, no enclosures should be permitted to sink closets, lavatory basins, or baths, and no waste-pipe should be closed against the admission of fresh air to every part of it. Not, however, until the householder recognises his responsibility and takes the trouble to find out the difference between the skilled and unskilled workman can he expect to receive immunity from the evil consequences of insanitary workmanship.

On the Friday evening the Mayor and Corporation of Lincoln were entertained by the Association.

Trade and Craft.

A SUBSTITUTE FOR MODELLED PLASTER.

A beautifully illustrated catalogue and price list of designs issued by the Cordelova Company, Ltd., of 74, Pitt Street, Edinburgh, has just come to hand. This work runs to nearly 200 pages, many of which contain several illustrations of the many patterns of Cordelova high relief ceilings, friezes, and dados, and low relief fillings, ceilings, and dados, as well as a large number of miscellaneous designs for furniture, door-panels, pilasters, pateræ, &c. The catalogue contains a unique collection of high-class ceiling designs. These designs are made in very convenient sizes for hanging. Our illustration shows an attractive design in Louis XIV. style in extra high relief. It also illustrates by means of the dotted lines how the panels are joined together without the relief parts being cut in the joining. The catalogue gives concise instructions with regard to ordering and hanging Cordelova. The prices charged for this material, more especially for effects of more than one colour or gold and colour, are much lower than the cost of employing a decorator to produce the same effects. Cordelova is easily hung. All that is necessary is that the material be trimmed with a knife and metal-edged straight-edge, and then pasted up. On most of the designs are guiding lines for trimming. For raw material ordinary paste is sufficient, and for decorated material the addition of a little Venice turpentine is advised. One length or panel should be pasted at a time and hung at once. The hanging should be done lightly, working on the ground of design only, without brush or roller. The company recommend the use of muslin, as a two-inch strip pasted on the wall or ceiling, under the joint, will effectually prevent any opening afterwards. After hanging, and when dry, reduced size should be applied; one coat for low relief, and two coats for high relief. Cordelova is one of the best substitutes for modelled plaster we have seen.



CORDELOVA: DESIGN FOR CEILINGS.

Brixham Wesleyan Church has been Enlarged at a cost of upwards of £1,000. The building has been reseated throughout with pitchpine lean-back seats. The vestry and old schoolroom at the back have been thrown into the chapel, additional accommodation for upwards of 200 persons being thus afforded. The orchestra has been enlarged to a seating capacity of thirty. The rostrum has been altered, and new exits have been made to each of the galleries. New ventilating and heating apparatus have been put in, and incandescent burners have been substituted for the old gas jets.

Messrs. Robert Boyle and Son, Limited, have received a diploma from the Ninth International Congress of Hygiene and Demography which was held in Madras last year. The diploma has been presented to the firm "in recognition of the service rendered to the public health by the introduction of their system of ventilation." The Spanish Government have employed the Boyle system of Natural Ventilation in a large number of public buildings in Spain, including the Chamber of Cortes, Government offices, barracks, forts, hospitals, &c., and Messrs. Boyle have received a number of valuable reports in respect of these buildings. Mr. Robert Boyle, during his "Sanitary Crusade" through Europe, devoted considerable attention to Spain and helped to awaken a deeper interest in that country in sanitary measures.

THE BUILDING TRADE DISPUTE.

THE Leeds Master Builders' Association held a meeting last Tuesday week at the Builders' Exchange, Leeds, to consider the terms of settlement proposed at a conference between representatives from the Yorkshire Masters' Federation and the London Order of Bricklayers, held on last August Bank Holiday. The terms proposed were as follow:—1. Bricklaying wages to be advanced from 9d. to 9½d. per hour. 2. That there be one apprentice to three bricklayers, and the limit to be six. That they be legally bound for not less than five years, their ages to be not more than sixteen years. 3. That no builder be allowed to take an apprentice before he has been in business twelve months. 4. The apprentice rule to be considered provisional till the National Rules relating to apprentices have been settled. 5. That no strike or lock-out shall take place under any circumstances without the matter in dispute having been first brought before the Standing Committee, which shall, however, meet to discuss the matter within forty-eight hours of notice being given to the secretary, and the work in dispute shall remain in abeyance until such time as the Standing Committee have settled the matter. The Standing Committee to consist of seven employers and seven operatives.

These terms were almost unanimously accepted at a crowded meeting of the London Order of Bricklayers held the previous Saturday night. The Leeds masters, however, are opposed to any advance of wages being granted, and at the meeting last Tuesday week, over which Mr. W. Nicholson presided, the following resolution with regard to the proposed advance of wages from 9d. to 9½d. per hour was adopted: "That the recommendation of the Yorkshire Federation be not accepted." The other proposals were discussed, and it was decided to adjourn the meeting for a week, and in the meantime to submit the questions to a ballot of all the members of the association.

At a conference, last Tuesday week, between Hull master builders and men connected with the building trade, a resolution passed at a meeting on the previous Monday was read. This resolution reaffirmed the masters' determination not to give way on the question of freedom of employment. The men replied that they would not consent to the condition, and left the conference. The masters declare their intention to at once open their shops to all men willing to work. Those on strike are confident that they will force the masters to accept their terms. The employers are quite willing to give a halfpenny per hour advance, to commence on the 26th inst., but state that they will stand to the fullest extent by all men who will work for them, and that they will seek no further conference with the dissatisfied operatives.

The Yorkshire Builders' Federation met last Wednesday afternoon to consider the attitude of the workmen at Hull, and after a lengthy discussion in private it was announced that the following resolution had been unanimously adopted:—"That this meeting of the Yorkshire Builders' Federation resolves, in consequence of the action taken by Union men in Hull in refusing to work with non-Union men, to fully approve of the course adopted by the Hull Master Builders' Association, and orders them to open their shops to all men at once as Free Labour shops, and they pledge themselves to support the Hull masters to the end, financially or otherwise."

Dundee Plasterers' Labourers have come out on strike for an increase of wages. The present rate of pay is 5½d. per hour, and the demand is for an additional ½d., an advance of ¼d. having been declined. At a meeting of the strikers last Thursday, attended by about 160, it was decided to hold out for the halfpenny advance.

Builders' Notes.

An Aintree Builder's Affairs.—A meeting of the creditors of Herbert Beech, a builder, of 23, Second Avenue, Longmoor Lane, Aintree, was held last Wednesday at the offices of the Official Receiver at Liverpool. It was reported that the unsecured liabilities amounted to £811 11s. 3d. There were creditors fully secured representing £9,498 16s. 6d., and they held securities of the estimated value of £10,028 8s. 3d., leaving a surplus of £529 11s. 9d. The assets, including the surplus of securities, amounted to £839 19s. 6d., leaving an apparent surplus of assets over liabilities of £28 8s. 3d. The debtor, who was twenty-three years of age, commenced business as a joiner and builder in September 1898, in partnership with a Mr. John M'Clusky, putting in £90 of capital. The partnership was dissolved in November, 1898, the debtor taking over the assets and liabilities. The debtor alleged that the cause of his failure was inability to obtain advances. No offer was made on behalf of the debtor, and it was resolved to wind up the estate in bankruptcy. Mr. Thomas Tranter, incorporated accountant, 24, North John Street, Liverpool, was appointed trustee, with a committee of inspection.

What is a New Building?—On Friday, the 11th inst., at the Chelmsford County Session, Messrs. S. J. and W. E. Gannon, machinists, &c., of Springfield Hill, were summoned, at the instance of the Chelmsford Rural District Council, for erecting a building at Springfield without giving notice of their intention to do so and without depositing plans. Mr. Thomas Dixon, solicitor, on behalf of the Rural District Council, stated that this was a very important case to local authorities. Some years ago a building was erected by Messrs. Gannon of corrugated iron, the measurements being about 20ft. by 16ft. This erection had been added to from time to time, but then there were no by-laws affecting such a work. Since the by-laws had been in operation Messrs. Gannon had commenced the erection of another addition to the original building, constructed of corrugated iron and wood about 12ft. square. The contention of the Council was that the building was a new one within the meaning of the by-laws, and that it was necessary for plans to be deposited and notice given of the intention to build. The defendants urged that this was not "a new building," and did not come within the meaning of the by-laws, and that they were not liable to deposit plans. If a building could be added to in this way a very small building could be made into a very large one, and the character of the whole could be entirely altered. Mr. Sutthery, for the defence, said that so far as they went the authorities were in his favour. The case of James v. Wyvill laid it down that every case was to be tried upon its merits, and that it was the duty of the Bench to find as a fact whether there was a new building or not. Lord Chief Justice Coleridge, in giving judgment, said that whether it was a new building or not was a question of fact and of degree. In Shiel v. The Mayor of Sunderland, a house and stables were erected before the Local Board of Health came into existence. After that authority had been established and by-laws had been introduced, the proprietor of the premises pulled down the coachhouse and stable entirely and built them away from the house partly on the site previously occupied. A covered way was erected from the house to these premises, and the whole structure was held to be an addition to an old building, and not to be a new building. In the present case the addition was almost infinitesimal as compared with the whole structure, and did little more than fill in a corner and make the structure square. The ground had previously had deposited upon it the very things that would be placed there now, and Messrs. Gannon merely thought it was time to place a roof over these. Mr. Chas. Pertwee, architect, gave it as his opinion that the erection was not a new building, but simply an addition to an old one, to which by-law 93, under which the action had been taken, did not apply. Mr. Dixon, addressing the Bench, said the case of Shiel v. The Mayor of Sunderland was a very old one. The judgment of Lord Coleridge in reference to a case where several floors were added to the building, which was thus adapted for a new purpose—that of occupation by individuals—was much more recent, and this said: The question whether a building is a new building or not has been decided over and over again to be a question of fact; it is a question of degree. For instance, if a building were nearly all taken away and re-built it clearly would be a new building. On the other hand it is quite clear that by a small addition of, say a door, the building would not thereby become a new building. Between these two extreme cases there may be thousands of cases, and it would be impossible to give a definition in each particular case as to what is or what is not a new building.—The Chairman of the Court (Mr Thos. Kemble) announced that the Bench had had some difficulty in coming to a decision, but they had made up their minds that this was a new building coming under the by-laws. In reply to a question, Mr. Dixon said the Council did not press in any way for a vindictive fine, but merely for a moderate one for the infraction of the by-laws, and costs. A fine of 5s. was imposed, with 14s. costs. The Clerk (Mr. W. W. Duffield) observed that, according to the contention of the defendants, an old building could be added to year after year for an unlimited time. The Chairman said the Bench had recognised this.

Masters and Men.

Masons' Labourers at Dunoon struck work last Wednesday in consequence of the masters refusing to concede them an advance of ½d. per hour, or failing that a ten hours' day instead of a nine hours' one.

The Plasterers' Dispute in Manchester.—A meeting of the master builders of Manchester, Salford and district was held in Manchester last Tuesday week "to consider the position arising out of the continued dispute with the plasterers and the steps to take." The case of the local master plasterers is that the men decline to resume work unless an advance of a penny an hour—from 9d. to 10d.—is granted. They offered a halfpenny rise and another halfpenny at the end of twelve months, but the men declined these terms. It was decided to lay the matter before a general meeting of employers of the district, representing all the branches of the building industry. The meeting was private. No decision of a definite kind was arrived at, and the meeting was adjourned for a fortnight.

Compensation Claim Against Garston Engineers.—His Honour Judge Shand heard, at the Liverpool County Court on August 11th, the following claim under the Workmen's Compensation Act. Francis Sloane, a corrugated iron roofer, claimed compensation from F. Horton and Co., Ltd., engineers and contractors, Garston. The applicant stated that while he was engaged in roofing a building at Peaton Hall, Diddlesbury, being then in the employment of the respondents, the scaffold on which he was working gave way, and he fell to the ground, a distance of over 30ft. He was, he alleged, severely injured, and although the accident took place in February last he was still unable to follow his employment. Mr. Jackson, for the defendants, urged that his clients were not undertakers within the meaning of the Act, as they had only to put on the roof, and were not constructing the building. His Honour pointed out that in connection with the building in question there were two contracts, one for the construction of the walls and the other for the roof. The defendants were working under their separate contract, and, in his opinion, were undertakers. Judge Shand held that the plaintiff had made out his case, and awarded him 15s. a week from the time of the accident until he should be able to resume work.

Engineering Notes.

Members of the Institution of Junior Engineers spent last week at Portsmouth, and visited the various places of engineering interest in the vicinity.

The Wesleyan Chapel, Formby, has been fitted with the latest improved hot water heating apparatus by John King, Limited, engineers, Liverpool, who have employed their well-known "small tube" apparatus, with special economical coil heater.

American Steel for Japan.—The Pencoyd Ironworks of Philadelphia, the contractors for the Atbara Bridge, have entered into a contract with the Japanese Government to supply within a year from 8,000 to 10,000 tons of steel for bridges. The price is stated to be 750,000 dollars.

American Engines for Glasgow.—The Glasgow Corporation Tramway Committee, at their meeting in Glasgow last week, considered tenders for supplying engines for the driving power for the Glasgow electric tramways. Mr. Parshall, the Glasgow electrical engineer, strongly recommended accepting the tender of Messrs. E. P. Allis and Co., of America, who offered engines for £114,554. By seven votes to six this tender was accepted. Messrs. Harvey and Williamson, of America, tendered at £160,000; while Messrs. D. Stewart and Co. tendered at £54,800, but offered a lighter engine.

New Dock at Barrow. — The Furness Railway Company obtained Parliamentary powers in the 1899 Bill for the construction of one of the largest graving docks in the world. The dock, which will be constructed alongside the present entrance basin to the Ramsden Dock, will have an entrance 100ft. wide from Walney Channel, and a similar width of entrance into the Ramsden Dock. The dock will have 30ft. depth of water, and will be about 1,000ft. in length. Before commencing this work the Furness Railway Company are busy deepening the sill of the Ramsden Dock by 6ft., making a clear passage through all the docks for all vessels of 30ft. draught, and up to a width of 100ft. This work will take nearly twelve months to complete.

Surveying and Sanitary Notes.

Cardiff Sewerage.—Cardiff County Council have adopted the plans of the long-talked-of western sewer. The estimated expenditure is £181,000.

Street Improvements at Ramsbottom.—Colonel A. G. Durnford, R.E , inspector of the Local Government Board, held an inquiry at Ramsbottom, on Tuesday last week, into an application made by the Ramsbottom District Council to borrow £3,453 for the purposes of private street improvements. The Council asked for twenty years in which to repay the money applied for. Part of the work in some of the streets had already been done and paid for out of the rates. Mr. J. Halliwell, surveyor, submitted plans and gave details of the work to be done. There was no opposition, and after the inquiry the inspector visited the various streets.

The Sanitary Institute's Lectures and Demonstrations.—We have just received an advance proof of the prospectus of the Sanitary Institute for its twenty-eighth course of lectures and demonstrations for sanitary officers. There will be six lectures on elementary physics and chemistry, two lectures on elementary statistics, meteorology, and local physical conditions, eighteen lectures on public health statutes, orders, memoranda, and model by-laws of the Local Government Board, and the by-laws in force in the administrative County of London, the practical duties of a sanitary inspector, municipal hygiene or hygiene of communities, building construction in its sanitary relations, measurement and drawing of plans to scale, and seven lectures on meat and food inspection. The various subjects to be dealt with will be given by well-known authorities, and will be illustrated with diagrams, drawings, models, and lantern slides. The lectures will include the subjects scheduled for the examinations of the Institute and the Sanitary Inspectors' Examination Board. Further particulars of these lectures and demonstrations can be obtained on application to the Secretary at Parkes' Museum, Margaret Street, Regent Street, W.

The Congress of the Royal Institute of Public Health will be held in Blackpool from September 21st to 26th this year. The Marquis of Lorne will preside over the Congress. The work of the Congress will be taken in four sections, and in addition there will be five conferences. Friday, September 22nd, and Saturday, September 23rd, will be devoted to Section C, which comprises engineering and building construction, and the following subjects will be dealt with:—The disposal of refuse; the Statutory Registration of Architects, introduced by Ellis Marsland, hon. secretary, the Society of Architects, London; disposal of sewage; public slaughter-houses; baths and wash-houses; artisans' dwellings; and the National Registration of Plumbers. During the Congress there will be a Health Exhibition, and in addition to the usual hospitalities there will probably be included a ball and a banquet on Saturday, September 23rd, at which the Marquis of Lorne will preside.

Public Improvements at Nuneaton.—On Thursday, Mr. H. Percy Boulnois, M.I.C.E., held a Local Government Board inquiry into an application made by the Nuneaton and Chilvers Coton Urban District Council for permission to borrow £26,060 for purposes of sewerage and sewage disposal, and the purchase and adaptation of a site for a town hall, and other public improvements. It is proposed to construct the new sewage works at Mancetter, in the Atherstone Rural District Council's area; and this is opposed by that authority, by the Ansley, Hartshill, Mancetter, and Witherley Parish Councils, and by Mr. S. B. H. Chamberlayne. For the applicants it was stated that the growth of the town necessitated larger works, and the removal of the present ones was highly desirable, as buildings were being erected all round them, and they were not 700 yards from the market-place. Besides, the Local Government had been insisting on treatment on land since 1896, and had refused to allow loans without it. The opponents contended that there was suitable land available in the Nuneaton area, and that the Council was trying to save money by locating a nuisance out of its proper area. The land selected was nearly surrounded by public roads, the railway ran through it, and so did a main road. Land near by had been sold for building purposes, and the place was likely to become thickly populated.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—		
Aug. 25	Celbridge, Ireland—Cottages	Rural District Council	The Architect, 33, Kildare-street, Dublin.
,, 25	Shoeburyness—House and Shop	....	W. Y. Hobbiss, 57, High-street, Southend.
,, 25	Shoreham, Sussex—Church and Schools	....	Gordon, Lowther and Gunton, Architects, Finsbury House, Blomfield-street, E.C.
,, 25	London, S.W.—Latrine and W.C. Accommodation	Kensington and Chelsea School District	C. Sharpe, 11, Old Queen-Street, S.W.
,, 25	London, W.—Repairs and Painting, &c., to Baths, &c.	St. Pancras Vestry	C. H. F. Barrett, Clerk, Vestry Hall, Pancras-road, N.W.
,, 26	Luton—Police Station	Bedfordshire County Council	County Surveyor, Shire Hall, Bedford.
,, 26	Carlisle—Bridge Works	Rural District Council	G. Armstrong, 24, Bank-street, Carlisle.
,, 26	Chartham, near Canterbury—Cemetery Lodge	Parish Council	A. Bromley, Architect, The Cathedral Precincts, Canterbury
,, 26	Illogan, Cornwall—Reseating, &c., Chapel	....	S. Hill, Architect, Green-lane, Redruth.
,, 26	Okehampton—Post Office	....	J. A. Lucas, Surveyor, Okehampton.
,, 26	Pontefract—Three Houses and Shop	J. Robinson	C. Keyworth, Architect, Bank-chambers, Pontefract.
,, 26	Wooda Bay, North Devon—Hotel	....	G. C. Smyth-Richards, Surveyor, Barnstaple.
,, 28	Halifax—Extension of Engine-room, &c.	County Borough Council	W. H. D. Horsfall, Architect Tower-chambers, Silver-street, Halifax.
,, 28	Godalming—Municipal Buildings	Town Council	Lanchester, Stewart and Rickards, 1, Vernon-place, W.C.
,, 28	Chesterfield—Schools and Swimming Bath	School Board	Tiltman and Jackson, 29, Knifesmith-gate, Chesterfield.
,, 30	Enfield—Underground Convenience	Urban District Council	R. Collins, Surveyor, Court House, Enfield.
,, 30	Malvern—Sanatorium	Urban District Council	Surveyor, Council Offices, Malvern.
,, 30	London, S.W.—Chimney Stack Works	St. George's Union Guardians	E. T. Hall, 57, Moorgate-street, E.C.
,, 30	Morley—Buildings	Sewage Purification Committee	W. E. Putman, Borough Engineer, Morley.
,, 31	Leeds—Sunday School, &c.	....	G. F. Danby, 10, Park-row, Leeds.
,, 31	Linthorpe, Middlesbrough—Twenty-two Villas	....	A. F. Newson, Architect, Albert-road, Middlesbrough.
,, 31	Manchester—Buildings	Corporation	C. Nickson, Superintendent, Gas Department, Town Hall Manchester.
,, 31	Monaghan—Extensions, &c., to Church	....	F. Dunwoody, J.P., Monaghan.
,, 31	Letterkenny—Repairing Breaches in Wall	Rural District Council	R. S. Walters, Clerk, Board-room, Letterkenny Workhouse.
,, 31	Plymouth—Laundry Buildings, &c.	Corporation	G. D. Bellamy, C.E., Courtenay-street, Plymouth.
,, 31	Sunderland—Workmen's Dwellings	Corporation	Borough Surveyor, Town Hall, Sunderland.
Sept. 1	Malmö, Sweden—Electric Works	....	Clerk, Gasworks, Malmö.
,, 1	Irvine, Scotland—Academy	Burgh School Board	J. Armour, jun., Architect, Irvine.
,, 1	St. Albans—Alterations, &c., to Premises	Corporation	City Surveyor, St. Albans.
,, 1	Bristol—Office	Corporation	T. H. Yabbicom, 63, Queen's-square, Bristol.
,, 2	Windsor—Sanitary Convenience	Town Council	Borough Surveyor, Helena-road, Windsor.
,, 4	Padiham—Technical Institute	Urban District Council	H. Ross, Architect, Cannon-street, Accrington.
,, 4	Hailsham, Sussex—Foundations for Asylum	East Sussex Asylum Visiting Committee	G. T. Hine, 35, Parliament-street, Westminster, S.W.
,, 6	Sandgate, Kent—Church and Schools	....	Gordon, Lowther, and Gunton, Finsbury House, Blomfield-street, E.C.
,, 7	Ballycrovane, co. Cork—Coastguard Station	....	Carpenter-in-Charge, Queen's College, Cork.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Sept. 7	Devonport—3 Shops and 24 Dwellings	Council...	J. F. Burns, 30, Ker-street, Devonport.
,, 8	Cromarty, N.B.—Coastguard Buildings	Admiralty	Director of Works, 21, Northumberland-avenue, W.C.
,, 9	Rhyl—Intermediate School	....	F. H. Shayler, Architect, Welshpool.
,, 12	Croydon—Superstructure of Asylum	Town Council...	Borough Engineer, Town Hall, Croydon.
,, 15	Enfield—Block of Schools	School Board ...	G. E. T. Laurence, 181, Queen Victoria-street, E.C.
,, 30	Hallwill, Devon—Cottage Hospital ...	....	C. F. A. Voysey, 6, Carlton Hill, N.W.
No date.	Watford—Offices and Warehouse	Benskin's Brewery, Limited	C. P. Ayres, 14a, High-street, Watford.
	ENGINEERING—		
Aug. 25	Hartley Wintney—Sewerage and Sewage Disposal Works	Rural District Council	Fairbank and Son, 13, Lendal, York.
,, 25	Pentre, Glamorgan—Gas Mains	Rhondda Urban District Council	O. Thomas, Engineer, Gas and Water Offices, Pentre, R.S.O.
,, 26	Blackpool—Hydrant Service in Town Hall	Corporation	Potts, Son, & Pickup, Architects, St. George's-rd., Bolton.
,, 28	Brighton—Excavating Trenches	Council...	F. J. Tillstone, Town Clerk, Town Hall, Brighton.
,, 28	Monmouth—Flood-Gates, &c.	Corporation	Engineer, Electric Generating Station, Old Forge, Monmouth.
,, 28	Willesborough, Kent—Water Supply Works	East Ashford Rural District Council ...	Bailey-Denton, Son and Lawford, 9, Bridge-st., Westminster.
,, 28	Perth—Electric Plant	Lord Provost and Commissioners	W. C. C. Hawtayne, 9, Queen-street-place, E.C.
,, 28	Westbury-upon-Trym—Sewage Disposal Works...	Barton Regis Rural District Council ...	A. P. I. Cotterell, 7, Baldwin-street, Bristol.
,, 29	Meare, near Glastonbury—Borehole...	Wells Rural District Council	A. P. J. Cotterell, Engineer, Bristol.
,, 30	Leeds—Electric Lighting	Tramways Committee	T. Hewson, City Engineer, Municipal-buildings, Leeds.
,, 30	London, E.C.—Workshop Machines	East Indian Railway Company ...	A. P. Dunston, Sec., Nicholas-lane, E.C.
,, 30	Morley—Sewage Purification Works	Corporation	W. E. Putnam, Engineer, Town Hall, Morley.
,, 30	Halesowner—Bridge Works	Worcestershire County Council ..	J. H. Garrett, Road Surveyor, Shirehall, Worcester.
,, 30	Westbury—Reservoir, &c.	Rural District Council	W. H. Stanley, Engineer, Market House-chbrs., Trowbridge.
,, 30	Enfield—Lathe, Shaping Machine, &c.	Urban District Council	T. W. Scott, Clerk, Court House, Enfield.
,, 30	Sophia, Bulgaria—Locomotives	State Railways	Commercial Department, Foreign Office, S.W.
,, 31	Newcastle-upon-Tyne—Boiler Plant...	New Tramways Committee	C. Hopkinson, 29, Princess-street, Manchester.
,, 31	London, S.W.—Crane, Electric Lighting, &c.	St. Mary's Vestry, Battersea	Vestry Clerk, Municipal-buildings, Lavender-hill, S.W.
,, 31	Devonport—Electric Tramways...	District Tramway Company	C. H. Gadsby, 20, Victoria-street, Westminster, S.W.
Sept. 2	Carmarthen—Reservoir...	Corporation	Borough Surveyor, Carmarthen.
,, 4	Belfast—Widening Dock	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Harbour Office, Belfast.
,, 5	London, S.W.—Locomotives ...	Secretary of State for India in Council	Director-General of Stores, India Office, Whitehall, S.W.
,, 6	Waterloo, Lancs.—Tramways...	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.
,, 9	East Ham—Electric Lighting, &c.	Urban District Council	W. C. Ullmann, The Limes, White Post-lane, East Ham.
,, 11	Preston—Bridge	Lancashire County Council	W. H. Radford, County Bridgemaster, County Offices, Preston
,, 12	Southport—Tramways ..	Corporation	J. D. Williams, Town Clerk, Town Hall, Southport.
,, 12	London, N.E.—Dynamos...	Hackney Vestry	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 13	Ilford—Railways	Great Eastern Railway Co.	Engineer, Liverpool-street Station, E.C.
,, 14	Birmingham—Water Distribution Works...	Corporation	J. Mansergh, 5, Victoria-street, Westminster, S.W.
,, 14	Leyton—Pumps, &c.	Urban District Council	Engineer, Electricity Works, Cathall-road, Leytonstone.
Oct. 14	Tiflis—Tramways Concession ..	Town Council...	Managing Department of Council, Tiflis, Transcaucasus.
Nov. 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
	IRON AND STEEL—		
Aug. 26	Bradford—Steel Girder Rails, &c.	Corporation	J. H. Cox, City Engineer, Town Hall, Bradford.
,, 28	West Hartlepool—Lamp Posts, &c. ...	Corporation	H. Simpson, Town Clerk, West Hartlepool.
,, 29	London, S.W.—Steel Bridge Chairs and Crane ...	Secretary of State for India in Council	Director-General of Stores, India Office, Whitehall, S.W.
,, 30	Westbury, Wilts.—Cast-iron Pipes, &c.	Rural District Council	W. H. Stanley, Engineer, Market House-chbrs., Trowbridge.
Sept. 9	East Ham—Steel Girder Tramway Rails ...	Urban District Council	W.C. Ullman, Engineer, The Limes, White Post-la., East Ham.
	PAINTING AND PLUMBING—		
Aug. 26	Stanley, Durham—Decorating and Painting Chapel	....	W. Forster, Architect, Clifford-road, Stanley, R.S.O.
,, 29	Burnley—Painting, &c., Market, &c.	....	W. Waddington, Market Superintendent, Burnley.
,, 31	Ulverston—Painting at Cemetery	Urban District Council	J. Atkinson, Registrar of Cemetery, Theatre-st., Ulverston.
	ROADS—		
Aug. 25	Lees, Lancs.—Street Works ...	Urban District Council	Blackburn, Page, and West, 54, Union-street, Oldham.
,, 25	Blandford—Road Works	....	C. Hunt, Architect, Blandford.
,, 25	Scarborough—Hire of Steam Roller...	Rural District Council	J. A. Iveson, 155, Prospect-road, Scarborough.
,, 26	Bradford—Granite Setts	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.
,, 26	New Malden—Materials, &c	Urban District Council	T. V. H. Davison, Public Offices, Cambridge-rd, New Malden.
,, 26	Devonport—Paving	Town Council...	J. F. Burns, Borough Surveyor, Offices, Ker-st., Devonport.
,, 26	Glenties, Ireland—Roads, &c.	Rural District Council	A. Hill, Clerk, Board Room, Glenties.
,, 26	Sandal Magna—Street Works...	Urban District Council	F. Massie, Engineer, Tetley House, Wakefield.
,, 28	Stranorlar, Ireland—Road Repair	Rural District Council	G. M'Laughlin, Clerk, Stranorlar.
,, 28	Waterloo, Lancs.—Road Works	Urban District Council	F. S. Yates, Surveyor to Council, Town Hall, Waterloo.
,, 29	Burnley—Tar Paving Work	Highways and Sewage Committee	Borough Surveyor, Town Hall, Burnley.
,, 29	Bedford—Paving and Roadmaking ...	Urban Sanitary Authority	Borough Surveyor, Town Hall, Bedford.
,, 29	Stanley, Durham—Street Works	Urban District Council	J. Routledge, Surveyor, Council Offices, Stanley.
,, 30	Halesowner—Blue Brick Paving	Worcestershire County Council	J. H. Garrett, Road Surveyor, Shirehall, Worcester.
,, 30	Erdington—Making-up Roads	Urban District Council	H. H. Humphries, District Surveyor, Public Hall, Erdington.
,, 31	Litherland—Completing Roads	Urban District Council	W. B. Garton, 25, Sefton-road, Litherland.
Sept. 2	Wolverhampton—Forming, &c., Roads	Public Works Committee...	J. W. Bradley, Boro' Surveyor, Town Hall, Wolverhampton.
,, 4	Wellingborough—Granite and Slag ...	Urban District Council	J. T. Parker, 29, Church-street, Wellingborough.
,, 6	Sutton, Surrey—Road Works ..	Urban District Council	C. C. Smith. Surveyor, Council Offices, Public Hall, Sutton.
,, 13	Croydon—Materials	Rural District Council	S. Stallard, Highway Surveyor, Town Hall, Croydon.
No date	Southend-on-Sea—Kentish Rag Stone Pitching...	....	A. Penney and Co., 107, Fenchurch-street, E.C.
	SANITARY—		
Aug. 25	Lees, near Oldham—Sewerage Works	Urban District Council	Blackburne, Page, and West, 54, Union-street, Oldham
,, 29	Epsom—Sewerage Works	Rural District Council	Beesley, Son, and Nichols, 11, Victoria-street, Westminster.
,, 30	Hebburn—Lowering Sewer, &c.	Urban District Council	J. B. Renton, Surveyor, Council Offices, Hebburn.
,, 30	Saxmundham—Removal of Refuse, &c.	Leiston-Cum-Sizewell U.D.C.	J. Fry, Clerk, Saxmundham.
,, 31	Basingstoke—Sewer	Works Committee	G. Fitton, Borough Surveyor, Town Hall, Basingstoke.
,, 31	Penmaenmawr, Wales—Sewering	Urban District Council	E. Worrall, Surveyor, Council Offices, Penmaenmawr.
Sept. 4	Lyme Regis, Dorset—Sewers ...	Town Council...	Town Clerk, Town Hall, Lyme Regis.
,, 4	Sonnig, Berks—Sewering, &c...	Workingham Rural District Council ...	R. W. Hamilton, 56, Hamilton-road, Reading.
	TIMBER—		
Aug. 26	Bradford—Wood Paving Blocks	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford.
,, 29	London, N.—Firewood ...	Edmonton Union Guardians	F. Sheldon, Clerk, The Grange, White Heart-lane, Lower Tottenham.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Sept. 1	Otley—Isolation Hospital	£30, £15	C. V. Newstead, Clerk, Wharfedale Union Joint Hospital Committee, Union Offices, Boroughgate, Otley.
,, 4	Northfleet—Schools	£15 15s.	Clerk to School Board, 49, Windmill-street, Gravesend.
,, 15	Workington—Town Hall	£40, £20, £10 ...	W. L. Eaglesfield, Surveyor, Town Hall, Workington.
,, 15	Dumfries—Public Library	....	J. Grierson, Town Clerk, Dumfries.
,, 16	Norwich—Bank	£52 10s., £21, £10 10s.	Secretary, Norfolk and Norwich Savings Bank, C.E.Y.M.S. Rooms, Norwich.
,, 28	Hay, Brecknock—Sewerage and Water Supply ...	£25	C. Griffiths, Clerk to Rural District Council, Hay.
,, 30	Tunbridge Wells—Designs in Tunbridge Ware ...	£3 3s., £2 2s., £1 1s. ...	Technical Education Committee.
,, 30	Island of New Providence, Bahamas, West Indies—Public Market	£40, £10, £5 ...	Civil Engineer to Board of Public Works, Nassau, Bahamas, *viâ* New York.
No date.	Broughton Moor, Cumberland—Institute and Twenty Cottages	....	Flimby and Broughton Moor Colliery Co., Maryport.

Property and Land Sales.

FREEHOLD BUILDING ESTATE, fronting on main road and close to golf links and Highgate Woods, seven minutes' walk from Muswell Hill and East Finchley stations. To be LET on lease or SOLD in plots. Liberal advances to responsible builders if required. For plans and particulars, apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington-road, N. 9

An acre of singularly valuable Freehold land, 270 yards from the Stock Exchange and opposite the north end of Throgmorton-avenue, Throgmorton-street, City, to be let upon 80 years' building lease direct from the Corporation, with a fully-licensed house thereon.

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Messrs.

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Other appointments for intermediate Sales will also be arranged.

Thursday, Sept. 21
Thursday, Oct. 12
Thursday, Oct. 26
Thursday, Nov. 16
Thursday, Nov. 23
Thursday, Dec. 7
Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

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There will be issued early in September No. 4 of "SPECIFICATION." The publication has been still further increased in size, and now consists of 650 pages. In addition to the usual material in the book, which has earned for it the name of "the builders' Vade mecum," a large number of new features have been added, as will be seen from the following list.

COMPLETE PRICES IN EACH SECTION.
PRICES FOR ARCHITECTS AND ENGINEERS.
LEAKING WINDOWS. Illustrated.
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FRESH NOTES, CLAUSES AND DETAIL DRAWINGS.
SPECIFICATION DIRECTORY ENTIRELY REVISED AND CORRECTED TO DATE.

Owing to the keen demand for previous issues, and the difficulty experienced in quarters of obtaining copies immediately on publication, we are now prepared to register the names of subscribers, who will receive copies as soon as issued.

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS

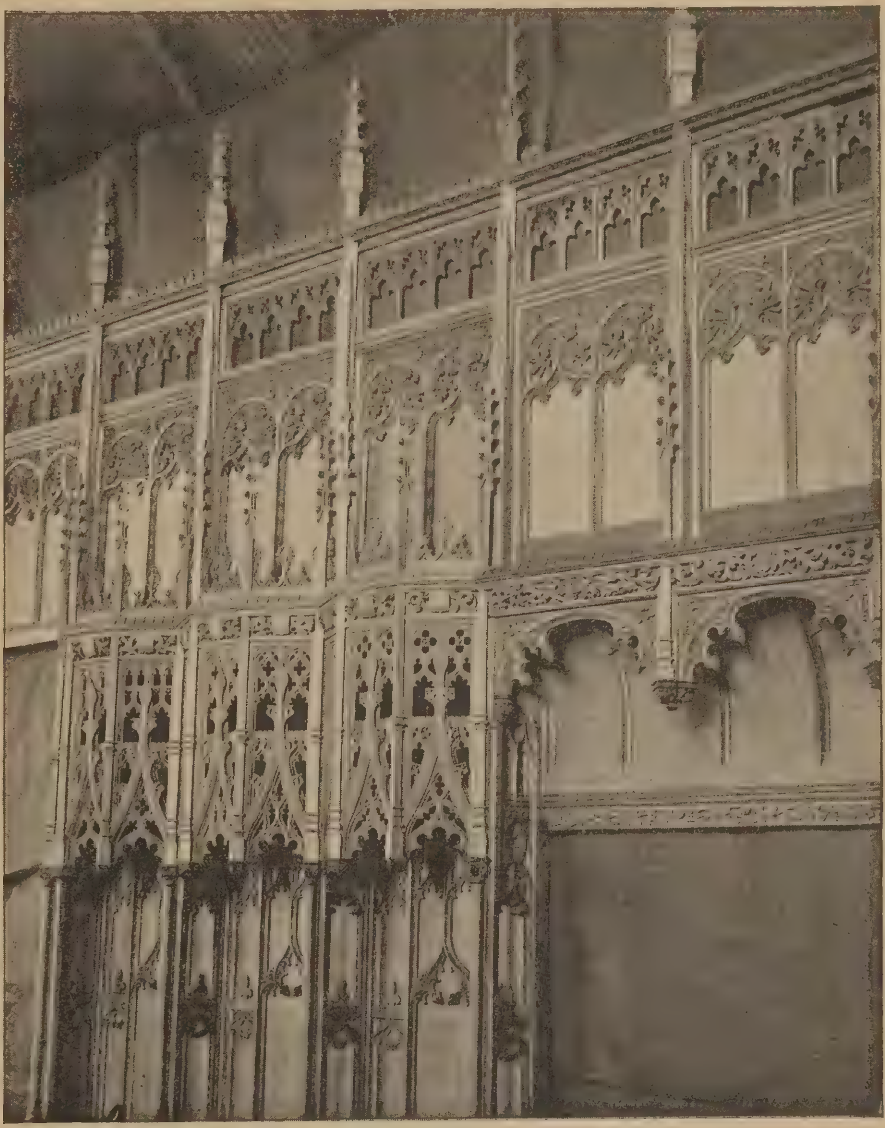
AUGUST 30, 1899.
No. CCXXXVIII.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

An Architectural Causerie.

Architecture in the Novel.—"Tess of the D'Urbervilles." IF a man wants to read good books, says that mordant philosopher Schopenhauer, he must make a point of avoiding bad ones. Continuing in the same strain somewhere else in his philosophy he tells us that it is well to read distinguished books twice, so that we may be the better able to understand the relation between the parts, and partly because we are not always in the same mood. In other words, he bids us follow in the footsteps of Quasimodo, who, by constant familiarity with the Cathedral of Notre Dame, came to realise the meanings and symbols of the bygone faith which lurked in all the angles and corners of the building. By association with the characters of Thomas Hardy, and the scenes where the dramas are played out, we may become as intimate with the districts and buildings as Quasimodo became with the spirit of Notre Dame. With the exception of two or three scenes towards the end of the story, "Tess of the D'Urbervilles"—one of Hardy's finest novels—is almost free from those wonderful descriptions of architecture that are found in "Jude the Obscure;" in place of them are the landscapes of "Blackmoor Vale" and the "Valley of the Great Daisies," that verdant plain so well watered by the river Froom. From there comes the sound of the reaping machine, the song of the breeze, as it whistles round the dairy house in the valley where Tess loved Angel Clare.

The two most beautiful descriptions of architecture are in the finishing chapters. In the last but one Tess, who is fleeing from "Justice" accompanied by Angel, passes through Melchester at night. "Out of the city, they plunge across an open plain. All around was open lonliness and black solitude. They had proceeded thus gropingly two or three miles further when on a sudden Clare became conscious of some vast erection close in his front rising sheer from the grass. They had almost struck themselves against it. 'What monstrous place is this?' said Angel. 'It hums' said she. Hearken. He listened. The wind playing upon the edifice produced a booming tune, like the note of some gigantic harp. No other sound came from it, and lifting his head and advancing a step or two, Clare felt the vertical surface of the wall. It seemed to be of solid stone, without joint or moulding; carrying his finger onward he found that what he had come in contact with was a colossal rectangular pillar; by stretching out his left hand he could feel a similar one adjoining. At an indefinite height overhead something made the black sky blacker, which had the semblance of a vast architrave uniting the pillars horizontally. They carefully entered beneath and between; the surfaces echoed their soft rustle but they seemed to be still out of doors. The place was roofless. Tess drew her breath fearfully, and Angel, perplexed, said 'What can it be?' Feeling sideways, they encountered another tower-like pillar, square and uncompromising as the first; beyond it another and another. The place was all doors and pillars, some connected above by continuous architraves. 'A very temple of the winds,' he said. The next pillar was isolated; others composed a trilithon; others were prostrate, their flanks forming a causeway wide enough for a carriage; and it was soon obvious that they made up a forest of monoliths grouped upon the grassy expanse of the plain." Later on we have another picture of the scene at the approach of dawn: "In the far north-east sky he could see between the pillars a level streak of light. The uniform concavity of black cloud was lifting bodily like the lid of a pot, letting in at the earth's edge the coming day, against which the towering monoliths and trilithons began to be blackly defined. . . . . The band of silver paleness along the eastern horizon made even the distant parts of the great plain appear dark and near; and the whole enormous landscape bore that impress of reserve, taciturnity and hesitation which is usual just before day. The eastward pillars and their architraves stood up blackly against the light, and the great flame-shaped sun-stone beyond them, and the stone of sacrifice midway. Presently the night wind died out, and the quivering little pools in the cup-like hollows of the stones lay still." Stonehenge—the heathen temple, as Tess called it—upon the probable origin of which so much has been written, is here brought vividly before the reader as it stands on "the great plain," lonely and desolate, except for the few tourists that visit it day by day.



FOR SELWYN COLLEGE CHAPEL, CAMBRIDGE. SIR A. BLOMFIELD AND SONS, ARCHITECTS.
(*See* page 51.)

Not so many miles from here is Melchester, where Jude the Obscure lived for a time. It is situated in a valley, and although the present inhabitants for the most part aspire to a belated "modernity," there still lingers in its streets and alleys, its churches and citizens, an atmosphere of the past which mildly protests against the encroachment of present-day civilisation. It had not always been situated in the valley, for about a mile away in a north-westerly direction is a hill where once stood Old Melchester. The site —formerly the scene of busy life and endeavour — rises gradually from the surrounding plain in two rings, the first and lower upon which the city was built, the second and higher where the citadel overlooked the town and valley. An early morning visitor will frequently find the top ring lightly clothed with a mist, that gradually rolls away as the first few rays of the Sun-god creep across the undulating plain, colouring in their progress the fields of stubble which, but a short while ago, were covered with waving corn, dotted here and there with poppies of a red, radiant hue. A whitewashed cottage, with thatched roof and small windows, catches the bright light, and the earth seems to stay its flight that the sunbeams might gaily dance upon the graceful spur of the Cathedral buildings of Melchester in the vale. Generation after generation has passed away, but there still remain on the site, and built into the boundary walls of the city on the plain, vestiges of the older Melchester. From legends and stories comes the tale of its rise and fall, finding a place on the leaves of the history book, at the time when first occupied by a tribe of Teutonic origin.

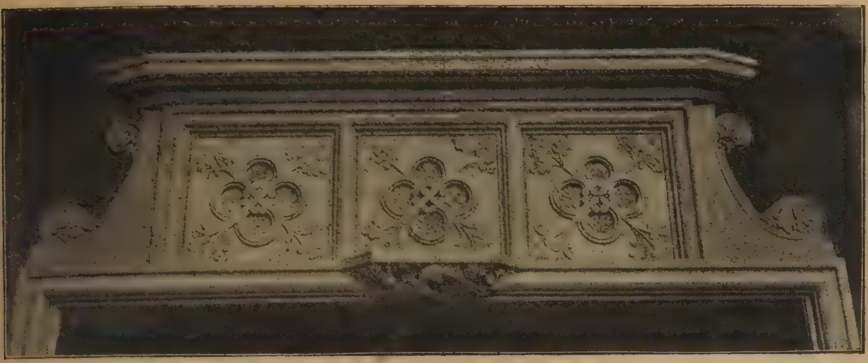
Another city—the one which witnessed the passing of Tess—is pictured in the last chapter of the novel, on the morning when "the President of the Immortals ended his sport with Tess." "The city of Witoncester, that fine old city aforetime capital of Wessex, lay amidst its convex and concave downlands, in all the brightness and warmth of a July morning. The gabled brick, tile, and freestone houses had almost dried off for the season their integument of lichen, the streams in the meadow were low, and in the sloping High Street from the west gateway to the mediæval cross, and from the mediæval cross to the bridge, that leisurely dusting and sweeping was in progress which usually ushers in an old-fashionod market day. From the western gate aforesaid, the highway, as every Witoncestrian knows, ascends a long and regular incline of the exact length of a measured mile, leaving the houses gradually behind. The prospect from the summit was almost unlimited. In the valley beneath lay the city, its more prominent buildings showing as in an isometric drawing, among them the broad cathedral tower, with its Norman windows and great length of aisle and nave, the spires of St. Thomas's, the pinnacled tower of the college, and more to the right the tower and gables of the ancient hospice, where to this day the pilgrim may receive his dole of bread and ale. Behind the city swept the rotund upland of St. Catherine's Hill, further off landscape beyond landscape till the horizon was lost in the radiance of the sun hanging about it." G. Ll. M.

On Reflection.

Stonehenge for Sale. After standing on Salisbury Plain for 2,500 years or thereabouts, the group of venerable stones which forms one of the most remarkable and mysterious ruins in the world is in some danger of experiencing the strangest vicissitude of its long history, viz., being transported to America. For the owner of the famous relics, Sir Edmond Antrobus, wishes to sell them, and an American gentleman has offered, we are told, to buy them. The mighty trilithons erected in an American park would be infinitely more grotesque and out of place than Temple Bar amidst the fields of Hertfordshire, and that is bad enough. Much of the mysterious charm of Stonehenge is due to its situation, and the only chance of discovering the secret of its origin seems to be in the excavation of the surrounding land. But the very idea is preposterous; to allow the venerable stones which were here before ever a Roman, much less a Saxon or a Norman, set foot on British ground, to pass into other hands would be almost an act of sacrilege. As well might we be expected to consent to the annexation of Cornwall or Kent by a foreign power; Stonehenge seems like part of our English soil. Happily the threatened calamity can be, and no doubt will be, averted. Before selling the place to the highest bidder, Sir Edmond Antrobus has offered to convey it to the Government for £125,000, a price which includes 1,300 acres of the surrounding land. The announcement of the threatened sale has caused quite a flutter of excitement and indignation, and there seems to be a general concensus of opinion that the Government must buy the ruins. Some think the price exorbitant; for ourselves we find it impossible to attach a money value to a unique historical monument like Stonehenge—no money payment whatever would compensate for its loss.

For the Nation or the Individual? These proceedings with regard to Stonehenge have given special timeliness to the discussion of two problems, neither of them new. The one is how to arrest the process of decay which is going on at Stonehenge. Year by year more of the stone becomes worn away, especially on the south-west face, and if the destructive force of rain and frost is not somehow arrested, it cannot be very long before the three remaining architraves will slip from their supporting columns, the foundations of which are being gradually undermined. Mr. Thomas Hardy, whose fine description of Stonehenge in his novel "Tess of the d'Urbervilles" is quoted in our leading article this week, has suggested that a wood should be planted to enclose the ruin and protect it in some degree from the wind and rain. That would, to some extent, alter the character of the landscape, but it would also, as Mr. Hardy points out, shut out the buildings that are gradually advancing over the plain and interfering with the impressive loneliness of the spot. The other question which these transactions have once more brought to the front, is the general one of the control of historical monuments. One does not need to be a Socialist or a Communist to experience a certain feeling of repugnance at the idea of any individual having the right to alienate or destroy, or to exclude the community from the enjoyment of objects of national interest which once lost can never be replaced. If the private owner regards himself as, in a sense, the trustee of the nation, and carefully and reverently guards the treasures in his possession, well and good. But if he regards them merely from the point of view of a vulgar commercialism, and ignores all artistic and sentimental considerations, it is surely the duty of the Government to step in and buy his interests at a fair valuation so as to preserve for future generations the sacred memorials of the past. We hope the action of Sir Edmond Antrobus will lead not only to the purchase of Stonehenge by the nation, but also to the concerting of measures for the acquisition of other national monuments, or the imposing on their present owners of stricter conditions in regard to their preservation and use.

A New Ideal City. From the days of Plato and the Apostle John, so many pictures of the ideal city have claimed the attention of mankind, and we are still so far from the realisation of most of these ideals, that men are apt to regard with impatience, or at the best with an amused incredulity, any fresh scheme for the establishment of ideal communities. That is the first and perhaps the greatest difficulty which Mr. Ebenezer Howard, author of "To-morrow," and the other enthusiastic folk who are acting with him, are likely to meet with in their attempts to carry into practice the principles of that little book. The word "Utopia" would spring naturally to the lips of the average man who should glance at the leaflets that lie before us as we write, setting forth the advantages of the proposed "Garden Cities" which it is the object of the newly-formed Garden City Association to bring into being. And yet there is nothing wildly Utopian about the scheme. Briefly, the proposal is to counteract the terrible overcrowding of our great cities and the evils incidental thereto, by building on a suitable site a city where manufactures and trade shall be carried on under the best possible conditions as regards sanitation, housing, open spaces, and so on. The city is to have not more than about 30,000 inhabitants, and the citizens are to retain for themselves the full advantage arising from increased value accruing to the land from their own exertions. The primary object of the Association is to discuss, and obviously much discussion will be needed before such a project can be carried out. For the moment we are not concerned with the details of the scheme, nor with pointing out the difficulties that lie in the way of its realisation; we shall probably return to the subject in a future issue. It is only fair to point out, however, that the scheme has several characteristics which differentiate it from other proposals having similar objects, and bring it more nearly within the range of practical politics. The new city is not to be founded in Paraguay or Tennessee, but in England and close to a railway. It is not a socialistic or communistic experiment; the citizens of "Garden City" may be as individualistic as they please. No one's property is to be confiscated and no one has to be compensated. If Mr. Howard's project ever becomes an accomplished fact, architects and builders will have a large and important share in its realisation. The chance of sharing in the building of a new city, which is to stand as an example of all that is excellent in construction and admirable in taste, is one which many of our best architects, would welcome with enthusiasm. Engaged in such a task they might well feel that their art was being put to the noblest possible use, and that they were indeed doing something to "build Jerusalem in England's green and pleasant land." Even those practical and unimaginative folk who would refuse even to consider the full programme of the Garden City Association may well admit that in seeking to check the growth of great cities by forming new centres of industry in country districts the Association is moving in the right direction.



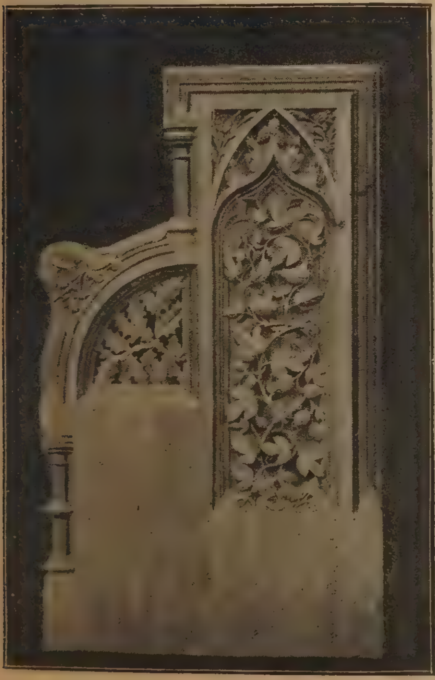
CHIMNEYPIECE FOR A ROMAN CATHOLIC PRESBYTERY. G. G. SCOTT, ARCHITECT.

A NOTABLE FIRM OF BUILDERS.

BY ERNEST RADFORD.

It is customary for writers and speakers to refer to the golden age of the guilds as if our own were the worst That the guild, like its modern successor the "union," was a frightfully exclusive body, and that the independent worker lived in fear of his life, is not so often remarked as it might be. I take it that the average man of a former age was about as narrow-minded and mean as the worst of ourselves, and the fact that he inclined to combine with his fellows when it was obviously the right thing to do is in no way remarkable. What was gained in the guild would appear to have been an amount of individual liberty which is rarely possessed to-day. Agreed that the guild and its members (none other) should execute certain works—then to each was allotted his portion, and we gather from what we have read that within the pale of these safe-guarded communities there was at least freedom from care, and a feeling of fellowship, failing which one had better be dead. Its members were not merely contented, but prone to be merry, for "Mirth that wrinkled care derides" is evident in much, very much of their work. Has anyone seen two *misereres* alike? And is it not perfectly clear that the modern time-limit renders it absolutely impossible that such will be seen again?

The worker in the guild may in this respect be compared with the monk, for the scribe, however humble his station, was free at least of his soul while engaged, regardless of time, on the sacred page of the missal. Except under kindly conditions, we cannot have art work done, and it may be said without exaggeration that the aspect of the things for the worker was utterly changed, and changed for the worse, when the funds possessed by the guilds were diverted into the king's pocket. "They were included in the Act for the suppression of the Colleges and Chantries in 1545, and those that then escaped fell in the first year of Edward VI." Of this measure the author of "Life in an Old English Town," writes: "It was the sweeping and iniquitous Act of confiscation known as the suppression of the guilds and chantries, rather than the dissolution of the monasteries which brought the citizens to the verge of ruin."



FOR SOUTHWELL CATHEDRAL. EWAN CHRISTIAN, ARCHITECT.

That the guilds became rich is well known, but these riches were freely bestowed on the poor of the towns and the workers, whereas the immediate result of the Act was a disastrous change of masters, the effects of which change are felt to this day, as it has beggared the spirit of art. That the artisan pure and simple is neither morose nor rebellious by nature we know very well. If he whistles over his work you may be sure he is perfectly happy. If silent, his silence is ominous, so it is not merely Christian but politic to attend to his needs sometimes.

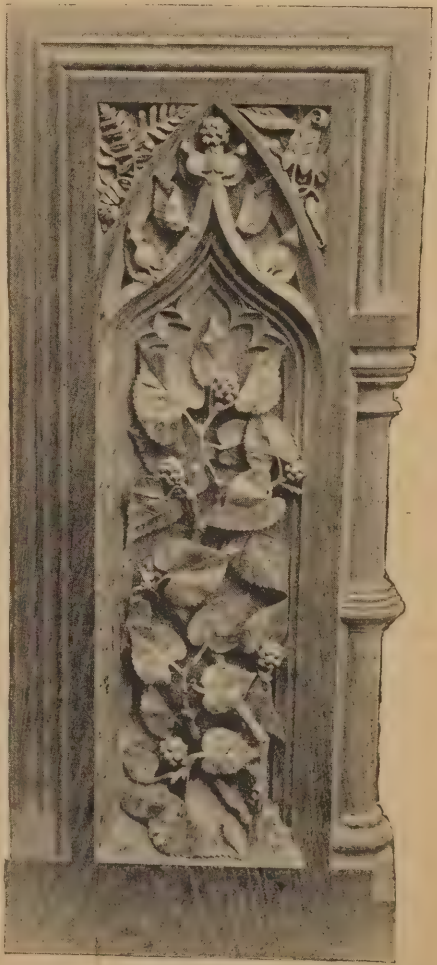
We cannot recall the past nor effect sweeping reforms all at once, but, watching the signs of the times, there are welcome indications of change; most welcome of all a disposition to recognise the dependence of the architect's art on the crafts, and *per contra* of the mere worker upon the inspirations he owes to something, not himself, that fellowship kindles and fosters. Mr. Fellowes Prynne, in a recent presidential address to the Architectural Association, referred to a good time coming when every practising architect will recall with the greatest pleasure the hours that were spent in the workshops and demonstration rooms attached to the Schools of Design, and count the experience among his chiefest possessions. But most important of all, I venture to think, because most generally lacking at present, is not so much the practical knowledge as the sympathetic understanding between Society's creatures and Nature's gentlemen which should be gained in this way. The historian of the future may wonder what parted them, and set himself to find out.

I may seem to have come by a somewhat roundabout way to the point at which I should have started, but Thought connects a good many things which may seem unrelated, and I have purposely dwelt in the past because, in fact, it is not at all easy to speak of modern work without being suspected of log-rolling, if individual artists are boomed, or of being the recipient of bribes when the work of a firm is praised. If the best is perhaps the least known, I suspect it to be for this reason. If here and there an unostentatious firm is discovered, it may be regarded as certain that it turns out exceptional work.

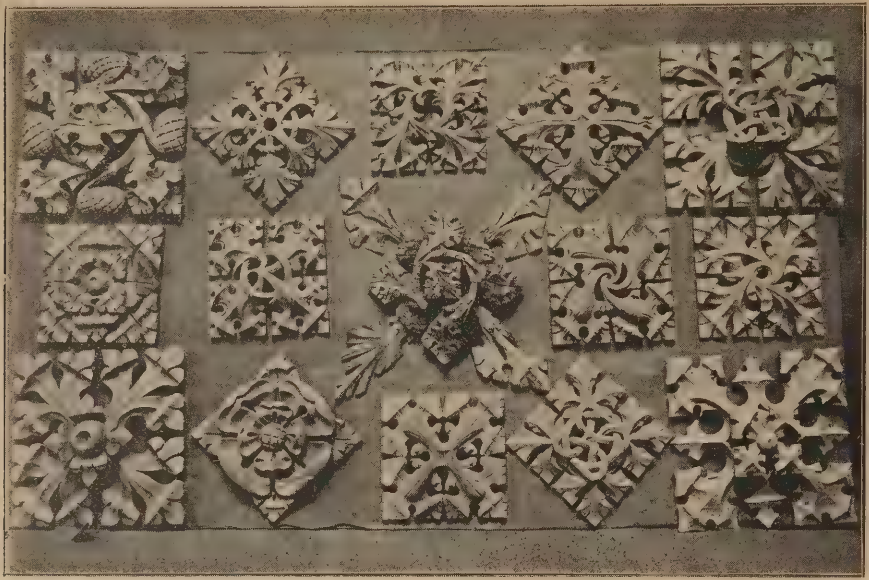
In converse with a wood-carver who is thought to be second to none in the kingdom, I discovered that he had been born and bred in North Walsham, the place where the works of Messrs. Cornish and Gaymer, the firm referred to in these notes, are to be found. I could not say more without echoing what I have heard of the master, and as for the workers, if I assume them to be happy, it is because I am quick to detect love or its absence in so-called art-work. I may say as to this, and it goes to the root of the matter, that the master, as he resides in the place, appears to be more in touch with the men than the ordinary architect can be. We have here examples of work in all, or nearly all, styles, and given the photograph, can judge fairly well of its quality. Of the "prentice hand" there is not a sign, I believe. The perfunctory visit which the architect pays to North Walsham will hardly make him more welcome than the policeman is to the child, and it is not to our purpose to say much about architects here. In the original designs for the choir stalls, lately restored at Southwell, there was the merest hint of the architect's wishes. For a model to be dealt with rather than copied, the workman has probably had before him some specimen of the original, and this is inferred from the fact that no two are alike.

Though unlike a well-ordered museum as possible, there is yet in these works, in the way of examples of ecclesiastical art, nearly all that could be desired, and if appearances are to be trusted it may safely be said that in the timber yard here is one of Nature's own training schools. The heads of the firm would be described, I suppose, as contractors and builders, for their undertakings include some of the most important works in the kingdom; they are as much concerned with the raw materials as with the beauties incidental to art that may be educed from them, and I gather from what I have seen that love of the finest material, the love that experience teaches, is nowhere learnt better than here. What pleased me as much as the timber were the specimens of workable stone that, carefully selected and labelled, are sent from all parts of the country.

The illustrations accompanying this article show a few examples of work carried out at the workshops of Messrs. Cornish and Gaymer.



FOR SOUTHWELL CATHEDRAL. EWAN CHRISTIAN, ARCHITECT.



FOR MOBERLEY CHURCH, CHESHIRE. W. D. CAROE, ARCHITECT. (*See p.* 51.)

"LAVENGRO" AT STONEHENGE.

To all who are in any way connected with the builder's craft the giant monoliths of Stonehenge—that supreme mystery of masonry—must possess a special interest. In view of the threatened sale of these unique relics of the mighty builders of a prehistoric age, it is interesting to recall the recorded impressions of writers of genius who have felt the fascination of Stonehenge. The remarkable word picture in which Mr. Thomas Hardy describes the "forest of monoliths" will be found quoted in our leading article. Scarcely less striking is the following passage from "Lavengro," in which that eccentric but wonderfully gifted writer, George Borrow, has recorded his impressions of the place :—

"In the midst of the tongue of sward formed by the two roads, collaterally with myself, I perceived what I at first conceived to be a small grove of blighted trunks of oaks, barked and grey. I stood still for a moment, and then, turning off the road, advanced slowly towards it over the sward; as I drew nearer I perceived that the objects which had attracted my curiosity, and which formed a kind of circle, were not trees, but immense upright stones. A thrill pervaded my system; just before me were two, the mightiest of the whole, and all, as the stems of proud oaks, supporting on their tops a huge transverse stone, and forming a wonderful doorway. I knew now where I was, and, laying down my stick and bundle, and taking off my hat, I advanced slowly, and cast myself—it was folly, perhaps, but I could not help what I did—cast myself with my face on the dewy earth, in the middle of the portal of giants, beneath the transverse stone. The spirit of Stonehenge was strong upon me."

A shepherd whose sheep come browzing past the circle of stones enters into conversation with the wayfarer. Says the shepherd :

"'Heard of the stones, I suppose? No wonder; all the people of the plain talk of them!'

'What do the people of the plain say of them?'

'Why, they say—How did they ever come here?'

'Do they not suppose them to have been brought?'

'Who should have brought them?'

'I have read that they were brought by many thousand men.'

'Where from?'

'Ireland.'

'How did they bring them?'

'I don't know.'

'And what did they bring them for?'

'To form a temple, perhaps.'

'What is that?'

'A place to worship God in.'

'A strange place to worship God in.'

'Why?'

'It has no roof.'

'Yes, it has.'

'Where?' said the man, looking up.

'What do you see above you?'

'The sky.'

'Well?'

'Well!'"

The strange colloquy presently turns into other channels. The distinction between "English" and "British" is discussed. The shepherd asks :

'Who were the British?'

'The men who are supposed to have worshipped God in this place and who raised these stones.'

'Where are they now?'

'Our forefathers slaughtered them, spilled their blood all about, especially in this neighbourhood, destroyed their pleasant places, and left not, to use their own words, one stone upon another.'

'Yes they did,' said the shepherd, looking aloft at the transverse stone.

'And it is well for them they did; whenever that stone, which English hands never raised, is by English hands thrown down, woe, woe, woe, to the English race; spare it, English! Hengist spared it!'"

In the light of recent events it would seem that there are some amongst us to-day to whom that final imprecation and appeal might with special appropriateness be addressed.

R.I.B.A. Examinations.—It may interest architectural students in the north of England to know that the R.I.B.A. Board of Examiners have agreed to make Newcastle a permanent centre for an annual preliminary and intermediate examination in June, provided there are sufficient northern candidates.

New Lungs at Openshaw and Crumpsall.—The recreation ground in George Street, Openshaw, and the new park at Crumpsall were formally opened on Thursday by the Parks Committee. The recreation ground extends to a little over seven acres and has cost £13,000. The new park is about twelve acres in extent and has cost £24,000.

A Masonic Hall and Club at Richmond.—It is proposed to erect a Masonic hall and club, on the site now being cleared for the purpose, near the Fire Engine Station. Mr. F. Brewer, architect, of Richmond, has prepared plans of the proposed building, which will contain a public hall having a vestibule, retiring rooms, &c. There will also be a large suite of offices. Beneath the large hall there will be a lodge room. A set of club chambers is also shown on the plans.

DUBLIN FOR THE ARCHITECTURAL STUDENT.

AN ADDRESS TO STUDENTS.

By THOMAS DREW, F.R.I.B.A.,
Pres. R.I.A.I.

(*Concluded from page 37, No. CCXXXVII.*)

Gandon used Corinthian columns, of his own choice, where the ground fell from the front, and so avoided obstructive bases and pedestals which would of necessity have been entailed by Ionic columns ranging all round. If any superior critic says that the architectural façade facing College Street on a fine, frosty, sunny morning is a stupid solecism, and not a fine congruous and satisfactory composition to do an architect's heart good to look at, I had rather not know so pedantic and fastidious a person.

In 1801, when the Bank purchased the poor played-out legislative shop from the Government for £40,000, some other "accidents" were the making of the design. There was a competition of architects. One, Baker, a drawing master and self-styled architect, is given credit for this. I do not believe a word of it. The marks of the hand of this audacious drawing-master architect were elsewhere to be seen at Christ Church and at St. Andrew's, and prove him an imposter and of accursed memory.

Francis Johnston, who carried out the alterations for the bank in 1802, was at least an architect, if a modest and unostentatious one. As a first improvement, Johnston saw his way to making the two quadrant sweeps correspond by building up a solid wall behind Parkes' Quadrant Collonade on Foster Place side, and by adding three-quarter engaged columns to Gandon's Quadrant on the College Street side. It scores for Johnston to have had so much good judgment and common sense. Some architects of our day would have seized the opportunity to exhibit their original genius and record it. They would probably have cut holes in Gandon's wall and interpolated Venetio-Gothic windows and balconies, inspired by Ruskin's stories of Venice, and have spoiled another corner of Dublin. Another happy touch of Johnston's to the building was the abolition of the glass windows in the great central portico, incongruous with its classic dignity and reflecting little glittering lights from the old-fashioned small panes of twisted crown glass of the description that still lingers in Dublin. A top-lighted cash office behind the screen wall dispensed with side windows, and so came about that fine solid monumental wall on which the pillars of the portico project such grand shadows in sunlight and moonlight.

Castle left his mark all over the country. Among his best known works are the older

FOR SELWYN COLLEGE CHAPEL, CAMBRIDGE. SIR A. BLOMFIELD AND SON, ARCHITECTS. (*See p.* 51.)

part of Leinster House, Tyrone House, the original Rotunda Hospital and Round Room, and many houses of the nobility and gentry of his day. One who is interested may meet his work in unexpected places up and down the country. There is no mistaking Castle's vigorous detail when your meet it, carried out with such artistic ability as his following of French and Italian colonists, carvers, modellers, iron workers, stucco workers could compass. Of the ordinary sort of Castle's work in private houses, near and convenient examples are of easy access, such as Ely House, Ely Place, the Church Representative Body's House, St. Stephen's Green, E., part of Leinster House, Tyrone House, and a fine old house in Henrietta Street, with a grand hall and staircase, now being dismantled and degraded into tenements.

Castle had a great practice, and was a benevolent and thirsty soul, who took a great deal of interest and whiskey punch, it is said, with his friend, Dr. Bartholomew Mosse, during their promotion of the first lying-in-hospital of the kingdom. He took one bumper too much for his health one night when down at Carton on business for the Duke of Leinster, and died suddenly in 1751, and was buried under the amazing big yew tree in Maynooth Churchyard.

While this bold architecture was being raised at the Parliament house the university was rebuilding Trinity College on the opposite side of the street in a tamer yet correct manner. Sir William Chambers (irreverently known in the office in the days of my youth as the "Cocker" of architecture, and whose big folio as an authority ranked with Holy writ) was the architect of new Trinity College, which superseded the Elizabethan buildings, and wiped out the last remnants of the Monastery of All-Hallows. His work was being built about 1770, when Parkes' and Gandon's work over the way was going on. Chamber's façade towards College Green stands on the lines of the old Elizabethan brick building which preceded it. Parliament Square, with its Chapel Hall and Refectory, is Chamber's characteristic work. He never visited Ireland. He sent a good sketch model of his design, which may still be seen in the college, and the plans and specifications were sent over by him and paid for at the correct 2½ per cent. His Casino at Clontarf for the Earl of Charlemont is illustrated in his big folio.

Thomas Cooley is the name of a Georgian architect, to be held in as great respect as those before mentioned. It was a competition that brought him to Dublin, and it was for the Royal Exchange, now the City Hall. There was the usual scheming and jobbing and working the oracle for friends, just as it might have been in our own century. I suspect there was an honest assessor. Thomas Cooley, of England, won the game with the best design. Thomas Sandby was placed second. James Gandon, run for the job by the all-powerful Beresford family, came in but third.

Space would not admit of dwelling on this work of Cooley's. It is, in a word, a refined and well balanced design of a master of English Renaissance architecture. It has but one crowning defect in a miserable ballustrade stage. Cooley served his time to a carpenter, and the poor wooden stair ballusters wrought in stone, are perhaps a reminiscence of his earlier craft. Cooley also was the designer of the Courts of Law—a remarkable building. He died before it was well begun, and his competitor, Gandon, finished it, and, improperly, is generally credited with the whole authorship.

James Gandon is a great name among this galaxy of architects of Dublin. His great work is the Custom House, and there is much study to be got out of it. It always strikes me when I am showing Dublin to the stranger architect that he is taken by surprise with its dignified architecture, and, most of all, the Custom House fetches him. There is a cast about it out of the common, and a dignity of simple mass that gets away altogether from the School of Wren, or Hawkesmoor, or Gibbs, familiar in London. Gandon was a sculptor first and an architect afterwards. There is a monumental disposition of parts in the Custom House that grows on one the more it is studied year by year.

If we except the stone soup-tureen, which serves as *acroteria*, and chimneys, and *smoke*, some of the details of this building are exquisite studies. Smyth's River-God keystones are unsurpassable, and the pose and *role* which the four statues (Europe, Asia, Africa, and America) play in the composition of the north front, facing Gardener Street, is of that true art which conceals art. In a little hall, seldom passed through by any but victims going to be eviscerated (figuratively speaking) by the detestable inquisition of the Income Tax, it is worth while to look for a small-scale treatment of the Ionic order, unsurpassed by any great example. It would be hard, we admit, for our good friends, the official architects, who are housed in this pile, to "live up to it." One feels that it is essentially frivolous for the Board of Works to court the Manes of the late departed Queen Anne and curly-wig its pediments in its official works.

FOR SELWYN COLLEGE CHAPEL, CAMBRIDGE. SIR A. BLOMFIELD AND SONS, ARCHITECTS. (*See* p. 51.)

Robert Mack was architect of Powerscourt House in William Street, and it is no despicable work; the date is about 1780.

Vincent Waldre, a whilom architect of the Board of Works, was a clever scene-painter architect about 1790. It is in St. Patrick's Hall, the one great State apartment of the Castle, that Waldre with his own hands painted on the oval ceiling of my Lord Newcomen's drawing-room, the sweet little cherubs that float up aloft on French grey skies, and now keep watch over the dear head of our Sir Charles Cameron, chief sanitary officer of our City of Dublin, and an honorary Fellow of our Institute of Architects. You can turn into many a house in Dublin and find bits of interest like this ceiling. I could show you a house in Mountjoy Square with mantelpiece frame plaques of Wedgwood's that are priceless. The student might do worse, for instance, with an idle hour than turn into the Church representative body's house in St. Stephen's Green and study the bold stucco decoration, thumb-moulded and modelled on walls and ceilings, and Angelica Kaufmann's lovely decorative painting in the old drawing-room and ball room, and some exquisitely detailed Italian chimney pieces.

I have not even touched upon Mediæval Dublin, as illustrated by its few surviving fragments, chiefly in its two cathedrals. It is a marvel that there is so much good Gothic work left in Dublin, and that it is so little studied. While there is nothing of the fourteenth or fifteenth century to study, there is good work of the thirteenth, enough for the student to discipline himself in drawing and measuring in the methods of Mediæval work, of its constructive origin, and the scale of its detail.

St. Patrick's Cathedral presents more for study than is generally appreciated. It has a very symmetrical and beautiful plan which has been preserved through all its indignities, mutilations, and restorations. It is worth measuring and laying down to demonstrate that the design was conceived on a rigid system of equal equilateral triangles applied to plan and section and elevation of the nave and choir arcade, triforium and clerestory. There is some old and genuine work in the choir and north choir aisle. There are some neglected Mediæval monuments that should be recorded and published. There is a Lady Chapel so well restored by Carpenter in 1845 that the student may regard it as a perfect preservation of beautiful work of 1255, as good as work of that period in the Temple Church, London, from which came, no doubt, inspiration by Henry the Londoner, the Anglo-Norman Archbishop of Dublin. There is a fragment of the Church of St. Patrick de Insula, precedent to its adoption as a collegiate and ultimately cathedral church by Archbishop Arnym, 1190, not yet investigated.

But of the old intra-mural Cathedral of the City, the Danish foundation of their Christchurch (Cathedral) of the Holy Trinity, there is no room to write within the compass of a paper like this. It is a subject for one as long in itself. There is enough left of fragmentary ancient work of the twelfth and thirteenth century and of beautiful detail to illustrate its history; and its store of records in MSS. is great and unbroken from the time of Sitric, the Danish king-founder in 1038, and the Anglo-Norman superstructure of 1190 and 1234 yet stands upon the Crypt Church of the Christianised Danes of 1038. The story of the Dublin Cathedrals has not yet been fully written. That the story of the interesting and unique chief church of Dublin, fully told and illustrated, would be enough for a publication by itself, is evidenced by the crowd of Dublin citizens who throng the church on each St. Stephen's day since its restoration by Mr. Street, when, by direction of the Dean and Chapter, a popular account of the church and its history is given at the tomb of its Anglo-Norman founder, Paul Strongbow.

WITH GREEK BUILDERS.

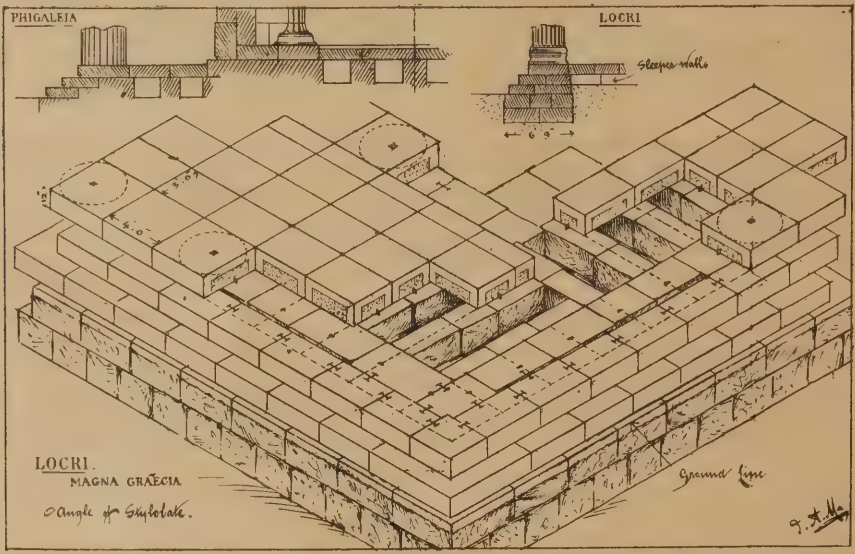
II.—CONSTRUCTION OF THE STYLOBATE.

BY JOHN A. MARSHALL.

(Continued from page 21, No. CCXXXVI.)

> *"Lo, a mossy architrave is here!*
> *I discern thee, fashioning spirit!*
> *On the stone thou hast impressed thy seal."*
> —GOETHE.

FOR the moment, however, we ask the student to confine his attention to the platform, or stylobate, on which the plan of the temple is inscribed, as on a huge drawing board. This platform, as usual, is raised three steps above the paving of the peribolus, and to receive the bottom step the top offset of the foundations is worked fair and flush with the ground, to show as a clean margin all round the foot of the peristyle. At Corinth, it will be remembered, the bottom step is hewn out of the rock on which the temple is built; and at the "Theseion" it is of the same material as the foundations, viz., hard Peiraic stone, the two upper steps being of Pentellic marble. In passing, we note that the foundations are constructed of very large stones, laid in alternate courses of headers and stretchers, diminishing in width towards the top, and that the stones are squared and fitted close together. For the arsenal at Zeia, the foundations are specified to be built of long stones, laid lengthwise and crosswise; on the top is to be laid a guiding course of worked stone, 3ft. wide, 1ft. 6in. thick, and 4ft. long, to receive the walls.



In ascending the steps of the stylobate, you will find that their height is not limited for your convenience; the object has been to provide a basement of suitable proportions for the superstructure.

An easy ascent was, however, sometimes provided to the principal entrance of large temples by a narrow flight of small intermediate steps, which did not interfere with the general massive character of the basement. Traces of such steps have been found at the Parthenon, but at Ægina, Olympia, and Delphi, a narrow incline, or ramp, was formed with the same object. In the case of the Propylæa, at Athens, some concession was made to convenience by limiting the height of each step—for so large a building—to 10in. As a rule, the height of the steps was not made uniform, but increased towards the top.

Where a portion of the top step has been displaced, you can see that the stones of the step below are tied together with H-shaped iron clamps, run with lead; the clamps are inserted in the top beds, so that they were covered and protected from the weather by the superimposed steps. All the stones are secured to each other vertically by iron dowels, which are let into the top and bottom beds, at the ends of each stone, to facilitate the running in of the lead. Especial care was taken, it will be observed, at the angles of the stylobate, in fitting the stones together, and clamping them to the backing stones (see sketch from Locri). The blocks are uniform in length, breaking joint over the middle of each, but in early work they sometimes vary, and then the jointing, in relation to the columns, is quite irregular, as at Assos, in the Troad, and the early temple on the promontory of Sunium.

When the jointing is regular, in Doric temples, the centre of the columns is either over a joint of the top step or over the middle of a slab; instances of the latter arrangement are the temple of Zeus at Olympia, the Propylæa at Athens, and the later temple at Sunium.

In the Ionic temples of Asia Minor the joints were rarely or never under the columns, but at Athens the columns of the Erectheion and the shrine of Niké Apteros are placed over the joints.

In building the superstructure of a peripteral temple it is probable that the heavy work of the peristyle was erected before the walls of the cella, as at Segesta. But whatever the course adopted, it is evident that the stylobate would be subject to rough treatment during the operations; it was not, therefore, expedient to work a fine face on its surface, so it was only coarsely tooled, and often left in that state after the completion of the building.

To receive Doric columns square or circular beds were sunk below the rough surface of the top step, leaving a fillet—in the case of square beds—along the front edge to protect the arris, and a notch was cut through the middle of the fillet to drain off the water, as at the Propylæa, Athens, and the temple at Rhamnus. At Segesta the beds are circular, with a notch in front; at Thoricus there is no fillet.

To bed the steps properly it was necessary to sink below the rough surface along the back of each tread, and to cut a draft along the bottom of each riser. These sinkings defined the finished faces, so that the stones could be set accurately to a line inscribed on the prepared beds.

The draft on the riser was sometimes interrupted by projecting pads or fillets, which were left on each side of the vertical joints to protect the arrises before the stones were placed in position; such projections are found at Assos, Segesta, and the Temple of Zeus at Olympia.

These technical peculiarities, including the projecting knobs or ancones—the use of which was perhaps to facilitate the moving of the stones—were very often permanently retained, and it is evident that their obliteration in temples of the Doric type was not regarded as essential. Indeed, in later work the drafts and fillets were sometimes elaborated as a matter of design, apart from utility. Thus at Phigaleia the elaborate treatment of the risers was evidently designed to be permanent, although it is clearly based on the temporary expedients before mentioned.

In Doric temples, the orthostatæ, or stones forming the deep lower course for the walls of the cella, had a draft at the bottom, like the risers of the steps, and for the same purpose. The Theseion is an exception; there a projecting moulding takes the place of the draft, as in Ionic temples.

When the paving of the temple was not bedded on the rock, it was a common practice to build sleeper walls to receive the slabs, placed at intervals equal to the length of each stone. For the ambulatory these walls were generally placed transversely, but for the naos, the pronaos, and the epinaos, they were placed longitudinally. At Phigaleia, the paving throughout rests on sleeper walls running longitudinally. At Delphi the slabs rest on walls both longitudinal and transverse.

For the stylobate of the Parthenon such walls were dispensed with, and the paving slabs, which are 12in. thick, rest on a stratum of coarse stone from the Peiraic quarries. Some of these stones seem to have been used for an older building.

The stylobate of the temple at Sunium is really a marble casing to an older stylobate of coarse stone; the original work was kept almost intact, but around the outside the foundations were added to with walling stones and architrave blocks taken from the earlier temple. The paving of the present stylobate is about 16in. above the old level, and to take the new marble paving, transverse slabs of coarse stone 9in. thick were laid on the old pavement.

For the ambulatory, the pronaos, and the epinaos, the slabs were usually arranged so that the jointing intersected like the lines on a chess board; but inside the naos only the longitudinal joints over the sleeper walls were continuous, the transverse jointing being irregular.

Respecting the manner of working such paving stones, some interesting information is given on an inscribed slab found some years ago built into the wall of a blacksmith's shop in Lebadea, a town in Bœotia.

Among other matters the inscription contains some practical stipulations for working and setting thirteen paving stones for the south flank of the temple of Zeus the King at Lebadea.

Pausanias records that in the second century, A.D., the town was adorned with buildings not inferior to any in Greece; but, he adds that the temple of Zeus the King was unfinished. Remains of the floor, and of the cella walls, were to be seen in the middle of the present century; but the stones have since been used for a church.

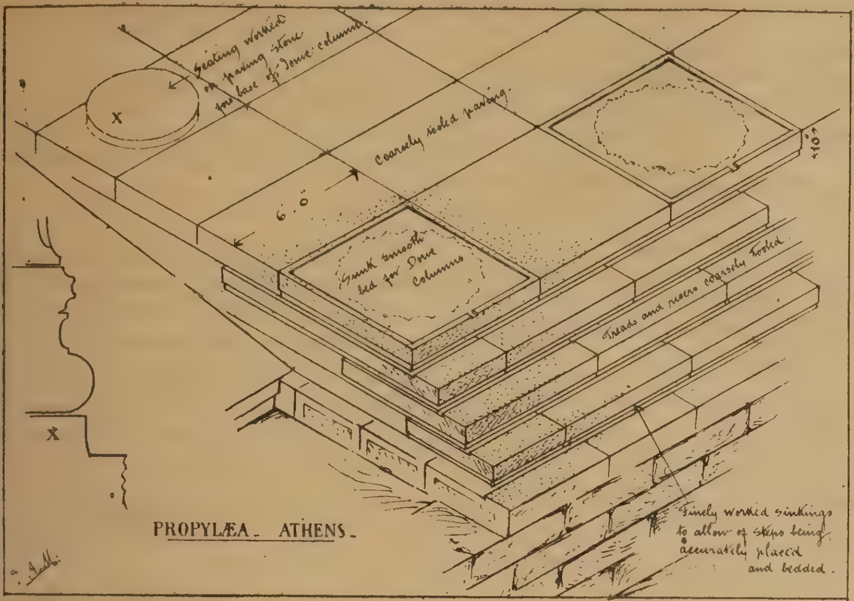
Unfortunately, the inscription bears no exact evidence as to date, but it probably belongs to the second century, B.C.

The thirteen stones to be worked were to be placed next to, and correspond in dimensions with, some already in position; these latter were most likely a row of paving stones next the cella wall, so that when the new stones were placed there would be a continuous longitudinal joint, with transverse joints intersecting at regular intervals, according to the spacing out of the columns.

The slabs already placed were resting on sleeper walls, the top bed of which, where exposed, had been left in a rough state. In addition to the sleeper walls there was also a ledge formed by the top off-set of the foundation along the inside of the peristyle. Thus each of the new slabs would have a bearing on three sides of its bed.

The spaces between the walls were generally filled in with stone chippings, but the paving was independent of this, and in preparing the beds it was only necessary to work three smooth margins, leaving the intermediate parts in a rough state.

The blocks are specified to be of hard Lebadean stone, and are to be supplied and delivered to the contractor at the temple, but no stone is to be worked until it has been examined and passed as sound by the officials, and if any delay occurs in the delivery of the stones, due allowance is to be made to the con-


PROPYLÆA . ATHENS .
Seating worked on paving stone for base of Ionic column.
X
Coarsely tooled paving.
6 . 0
10
Sunk smooth bed for Doric Columns
Treads and risers coarsely tooled
X
Finely worked sinkings to allow of steps being accurately placed and bedded.

tractor for the time lost. If a sound stone is spoilt in the working, the contractor is to provide another at his own expense, without delay, and remove the spoilt stone from the temple precincts within a stipulated time, failing this, he is to pay the full value of the stone and half as much more. The contractor is not to be held responsible for a stone which may turn out to have some natural defect.

In working a stone, the bed or underside is first to be brought to a tolerably even surface with a coarse-toothed chisel, then the three margins or bearing parts are to be cut down about half an inch below the rest and gone over with a close toothed chisel; the margins are to be tested by applying a canon or straight-edge not less in length than the stone, and 6in. by 4½in. scantling.

The sides or vertical faces are next to be worked to plane surfaces and at true angles, by applying the square. To get a true adjustment to the adjoining stones a smooth margin is to be worked on the top and sides only of each face, using a smooth sharpened chisel. While for the intermediate part—which was sunk a little below the margin—a coarse-toothed chisel is to be used. This method of treating the vertical joints is universal in Greek masonry, and ensured perfect accuracy of adjustment with the least labour.

Stone canons are to be applied in some way to the vertical faces, and in connection with this operation is a reference to the use of vermilion, but how or why it was employed, is not clear. A general clause stipulates that pure olive oil and vermilion of Sinope is to be used for the canons, and in default the contractor is to be fined by the officials, and no stone is to be locked in until the officials are satisfied that this requirement has been complied with.

From this it may be inferred that the use of vermilion was not restricted to making the lines in setting out the work; it would almost seem that the bearing parts were to be rubbed with this composition, using the stone canons in the process, the object being, perhaps, to render the joints still more accurate and water-tight.

These canons are to be repeatedly cleaned or scraped, and corrected by a stone canon kept in the temple, whenever the contractor is ordered to do so by the officials. Vermilion was also applied to the wood canons to enable the workman to readily detect irregularities on the surface of the stone.

Traces of this colour have frequently been found on newly exposed jointing of Greek masonry, although it is not probable that the composition was applied as a permanent coating, especially in view of the fact that in the inscription under notice the joints are specified to be cleaned with soda and pure water before the stones are placed in position; possibly the colour found was merely a portion that had accidentally got on to the rough intermediate parts, and which it would not have been worth while to wash off.

When the contractor has worked the new stone he is to turn his attention to the thirteen stones *in sitû*. The exposed vertical faces of these had apparently been left in a rough state, as a protection, pending the completion of the new work, and perhaps to admit of more accurate adjustment. In the first place, a cord was to be stretched the whole length of the stones, near the edge, to get a line parallel to the walls of the cella, and which should mark the longitudinal joint, so that the irregular part in front could be accurately cut off.

The exposed vertical faces were then to be reduced to an even surface and tested by applying a wood canon or straight-edge, not less in length than 20ft., and 6in. by 4½in. in cross section. The stones being *in sitû*, of course permitted the use of a longer canon than when the stones were worked singly.

To ensure an accurate correspondence with the margins of the new stones, the old are to be treated exactly in the same way, and rubbed with a stone canon, using vermilion properly, and the stone canons are to be repeatedly tested by the one kept for the purpose in the temple.

When the new stones are about to be placed, the exposed top beds of the sleeper walls, which had been left rough, were to be re-dressed with a close-toothed chisel. The new stones were then to be placed, beginning at one end, and proceeding in regular order, after the beds and joints have been shown to the sub-architect, and cleaned with soda and pure water.

The insertion of the iron dowels and the running of the lead is to be done in the presence of the officials or their representative, the contractor being also present, and the weight of the metal actually used is to be recorded at the time; and should any stone be locked in that has not been shown, it is to be taken up and re-worked, and the contractor fined as the officials may determine. After the stones have been placed, the top surface is to be dressed with a clawed tool, and the long canon and the level applied throughout, having regard probably to the falls for carrying off the water, and to the optical refinement of the curve of the stylobate. Pieces of dry olive wood are to be prepared, and these were perhaps used as blocks for adjusting the canon when taking the levels.

(*To be continued.*)

Correspondence.

DELPH STONE.

To the Editor of The Builders' Journal.

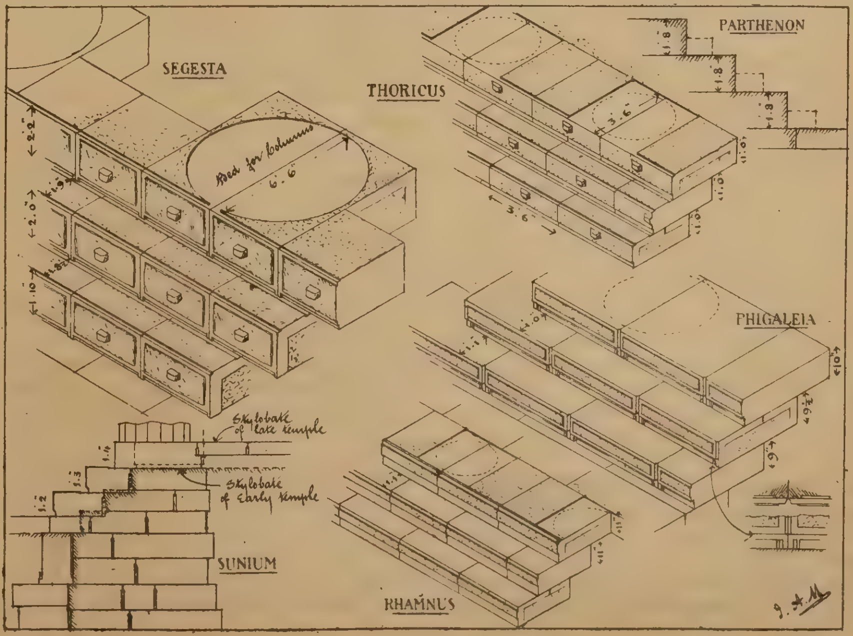
Barnsley.

Dear Sir,—Delph stone as known in the West Riding is a very fine grained ashlar, generally of a grey or blue colour, weathering well, mostly very hard and taking a fine face when polished. It is found in many districts, but perhaps one of the best varieties is that obtained from the Green Moor Quarries, near Sheffield. It is largely sawn up and used for superior landings, flagings, &c., as well as for monumental work, but rather bad to work and liable to change of colour after fixing.

Geologists generally classify this species of stone with flagstone strata, but only the top lifts can be riven into flags, and they are very rough. As your correspondent of the 16th inst. says, a quarry is called a delph in some parts, but generally the term only applies to the quarries where this Delph stone is obtained and not to the ordinary sandstone quarries.

I suppose the word is derived from "delve," to dig, and in a good many localities the stone is found very near the surface, so that by digging it is uncovered.—Yours faithfully,
George W. Swift.

Professor Banister Fletcher's Will—Professor Banister Fletcher, who died on July 5, aged 66, has left estate which has been valued at £75,813 gross, including personalty of the net value of £39,165. The whole of his property was bequeathed to his wife absolutely.



Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

PIER BUILDING.

To the Editor of THE BUILDERS' JOURNAL.

OLD CHORLTON.

SIR,—I am very much interested in the article on Pile Driving, by Mr. Ellis, in your issue of the 9th inst. Could you kindly refer me to any volume in which wooden pier building is treated?—Your obedient servant,

J. M.

We do not know of any book on wooden piers. It is possible that a paper on the subject might be found in the Proceedings of the Institute of Civil Engineers. The volumes containing these Proceedings might be consulted at a public library, or they could be obtained from Batsford, 94, High Holborn, London.

"FATIGUE" OF MATERIAL.

To the Editor of THE BUILDERS' JOURNAL.

LIVERPOOL.

DEAR SIR,—Will one of the members of your staff kindly answer the following question taken from a recent exam. paper: Explain the terms "fatigue of material," "deflection," and "permanent set," and point out their bearing on carpentry work. I would be pleased to know if there is any book which deals with the fatigue of materials used in the building trade, as I do not find the matter mentioned in the building trade text books?—Yours faithfully, STUDENT.

There is a temptation to enquire what building trade text books our correspondent has consulted. At any rate he will find a definition of each of the terms mentioned in the Glossary attached to "Specification," price 5s., from these offices. We would also refer him to "Building Construction" (commonly known as "Rivington"), especially Vols. 3 and 4.

G. A. T. M.

PREVENTION OF DOWN DRAUGHT.

To the Editor of THE BUILDERS' JOURNAL.

LANCASTER.

DEAR SIR,—I should be obliged if you could inform me what is the best method of stopping down-draught in a straight flue; if by means of a "patent pot," which is the least unsightly but at the same time effective? At present the flue is surmounted by a red cone 20in. high. Also which do you consider the best appliance for curing a smoky flue not necessarily straight?—Yours truly,

SMOKE.

Your correspondent gives no clue as to the cause of the down-draught, but I presume in this case that the flue is one of several in one stack, the top of which is carried well above the ridge of roof, and the trouble may be caused by the tops of the red "cones" being all on one level. If this is the case a simple remedy would be to fix pots about a foot higher on every alternate flue. The nuisance may also arise from the flue not being gathered sufficiently up into the throat of the chimney; this is a frequent cause of trouble. The down-draught may be caused by cross currents from an adjacent building, or the proximity of trees, in which case I would recommend an anti-down-draught top with syphonic action as the only means of curing this, whether the flue is straight or otherwise.

E. P. M.

WORKMEN'S COMPENSATION ACT AND HEIGHT OF BUILDINGS.

To the Editor of THE BUILDERS' JOURNAL.

HANLEY.

DEAR SIR,—I shall be obliged if you will give me the rule followed by surveyors in determining the height of a building for the purpose of the "Workmen's Compensation Act."

Would a surveyor be entitled to include a cellar or a chimney, either one or both, in his measurements in obtaining the height? If not, kindly inform me what would be the correct course to adopt?—Yours truly,

R. W.

The Act does not contain any definition of the word "building," or of the word "height," nor has there been, so far as I am aware, any decision upon the meaning of either. In the only case in which any question as to "height" arose—Billings v. Holloway (1899) 1 Q. B. 70—it was apparently assumed that the height was to be measured from the ground. The London Building Act (1894), sect. 5 (21), defines "height" in relation to any building, to mean the measurement taken from the level of the footway (if any) immediately in front of the centre of the face of the building, or, where there is no such footway, from the level of the ground before excavation, to the level of the top of the parapet, or where there is no parapet to the level of the top of the external wall, or (in case of gabled buildings) to the base of the gable. But these provisions are made with a view to prevent the obstruction of light and air; while those of the Workmen's Compensation Act are made for the purpose of relieving workmen injured by accidents, and I think therefore that the height, for the purpose of this Statute, should be measured to the highest point to which the structure reaches (and should therefore include a chimney) from the lowest level to which a workman could fall, or to which anything could fall on him (and would therefore include any excavated space which remained exposed down to the foundations—*e.g.*, an area or an open cellar). But in the absence of definition or judicial decision, this is merely the view of counsel, who may of course be mistaken. I may mention the "height" is the *actual* height which the building has attained at the time of the accident, and not the *intended* height.

H. P. B.

ARCHITECTS' CHARGES.

To the Editor of THE BUILDERS' JOURNAL.

DROGHEDA.

DEAR SIR,—We have a building at present in hand the contract for which expires on the 1st prox., but the building is not nearly finished as yet.

The delay in completing the works up to time is due partly to additional or extra work, and partly to the fact that the plastering and other works have been retarded through the public board for whom the works are being carried out, making considerable delays in deciding upon a lighting scheme, and in deciding the contract in connection therewith.

The contractor (although an excellent man) has taken advantage of these circumstances to give his attention to other important contracts, knowing that the majority, if not the whole board, is friendly to him.

He did not, at any time, cease work altogether, so that our fortnightly visits had to be paid as regularly as if the job had been fully manned. It will take at least six months to complete the job. We shall be kept out of our commission all that time as well as having to be at considerable loss of tim in travelling, hotel, and incidental expenses. Are we not entitled to be paid for extra time, travelling and incidental expenses?

In notifying the Board as to expiration of the contract and recommending that the contractor be given an extension of time, should we not at the same time give notice of our intention to apply for extra remuneration in connection therewith?—Yours faithfully,

HIBERNIAN.

The right to additional remuneration depends upon the special contract, if any, between the parties. If there be no special contract, the amount of remuneration will depend upon these extra services as well as all other services rendered, the remuneration being "reasonable" all circumstances considered. There will be no harm in giving the proposed notice.

H. P. B.

. . A NEW . .

TRADE JOURNAL

(ISSUED TO SUBSCRIBERS ONLY).

There will shortly be published, from the offices of the BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, a trade journal for all interested in Furniture, Decoration, Upholstery, Art Metal Work, Stained Glass, Ironmongery, Brassfoundry, Electroplate, and Art Pottery.

THE FURNISHER,

as the new journal will be named, will be produced in a style never before attained by any trade journal. The paper and printing will be of a superior quality, and the illustrations will be reproduced in a style similar to those in the ARCHITECTURAL REVIEW and other high-class Magazines.

THE FURNISHER will contain articles by

Acknowledged Experts

in their respective trades, and will illustrate the work of the most eminent designers and manufacturers. The subjects treated will include all branches of the furnishing trades, and the journal will be, in fact,

Seven Trade Journals in One.

Suggestions of the greatest practical value to all engaged in the trades, whether manufacturers or retailers, will be given

All trade news will appear in THE FURNISHER, new inventions will be noted, new books reviewed, and questions of interest discussed. Commercial information will be given in detail, and the journal will be indispensable to every person who designs, manufactures, sells or buys what goes to the furnishing or decoration of either public building or private house.

THE FURNISHER will be published monthly, price 6d., but will only be obtainable by Subscribers, who must be connected with the Trade.

Offices:—Effingham House,
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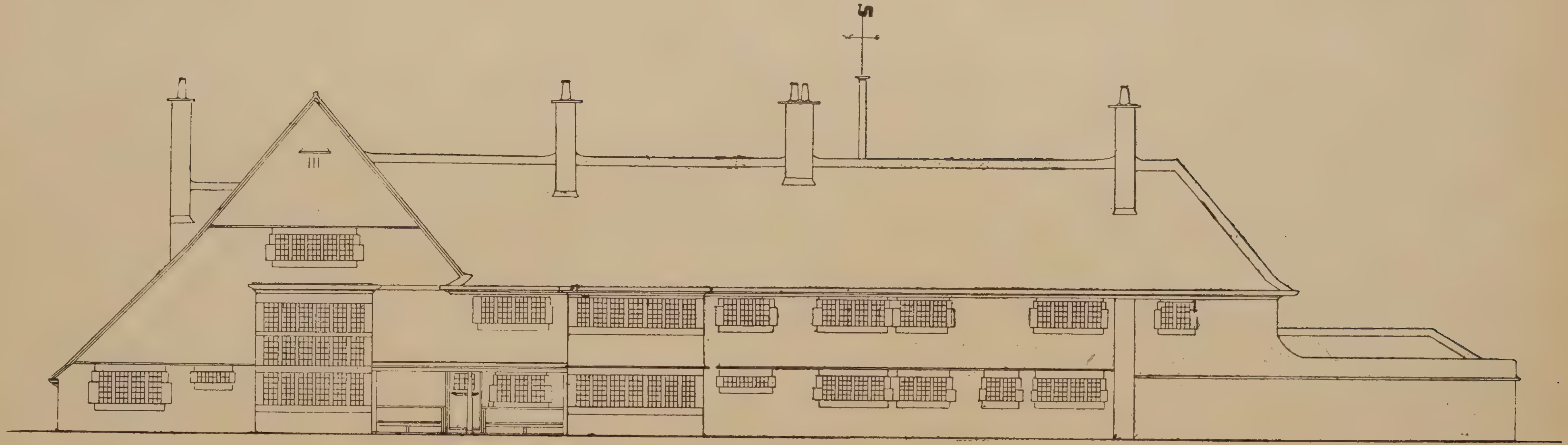
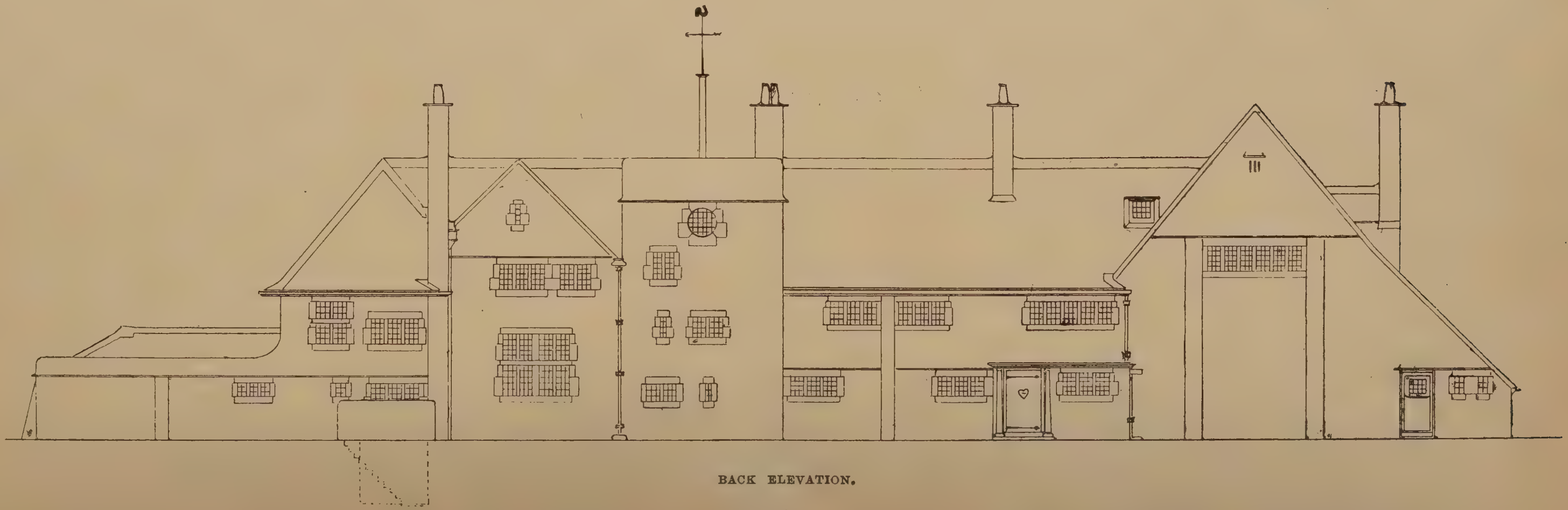
SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, WEDNESDAY, AUGUST 30, 1899.



FRONT ELEVATION.



BACK ELEVATION.

HOUSE, NEAR GUILDFORD, FOR MR. JULIAN STURGIS. C. F. A. VOYSEY, ARCHITECT.

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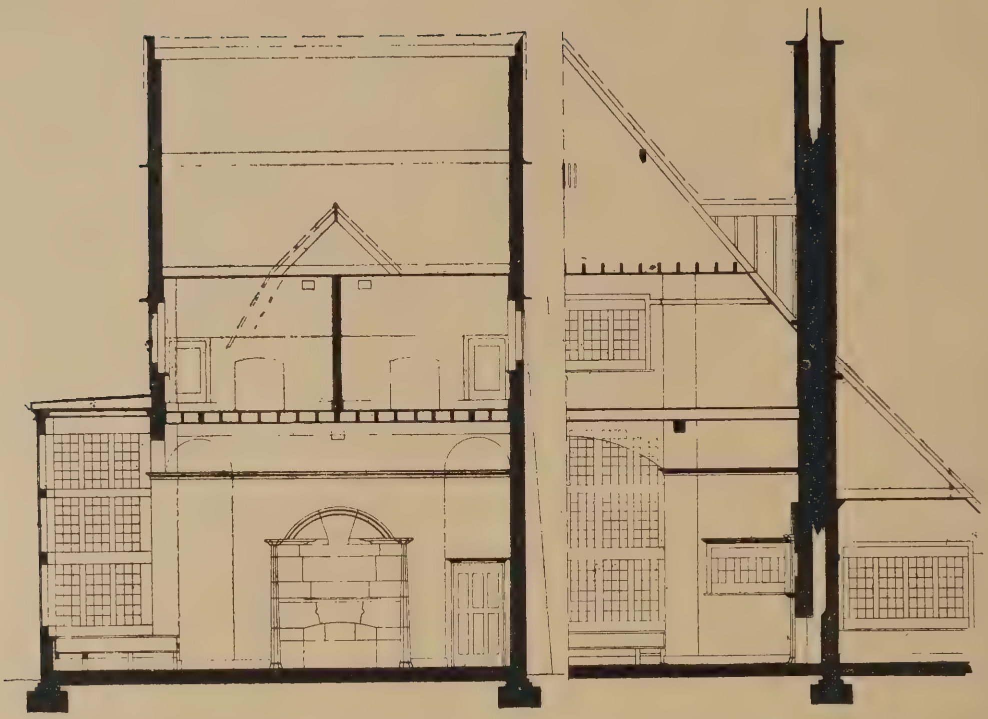
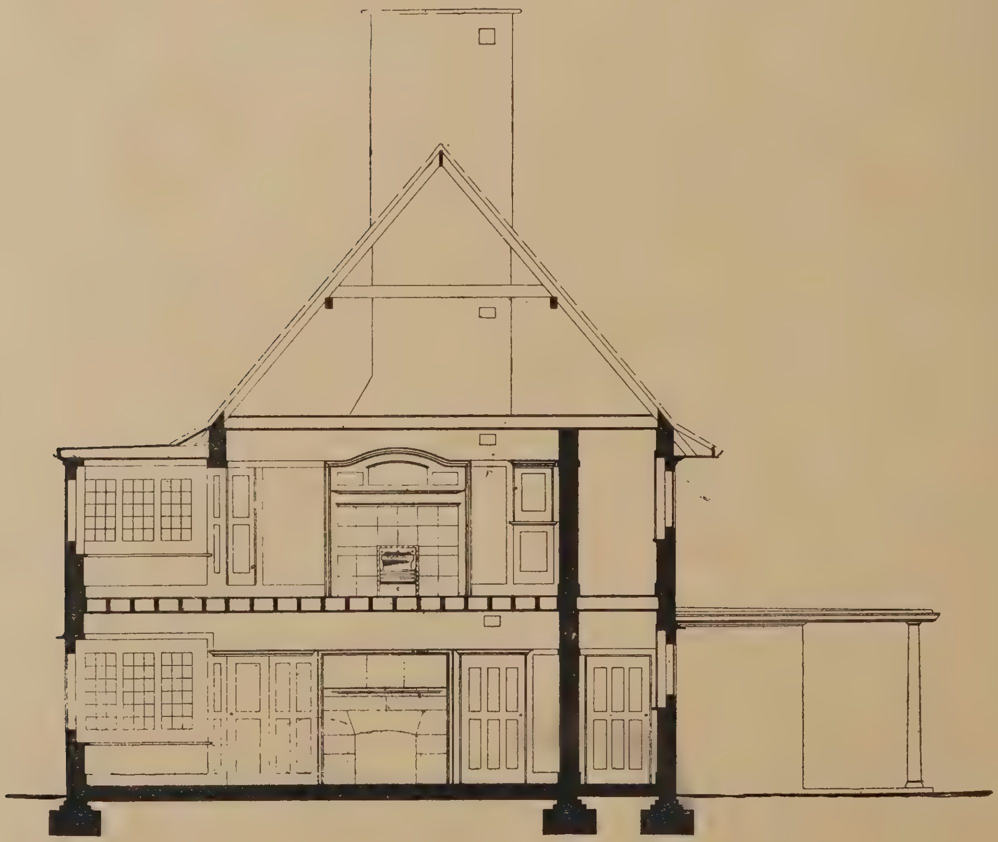
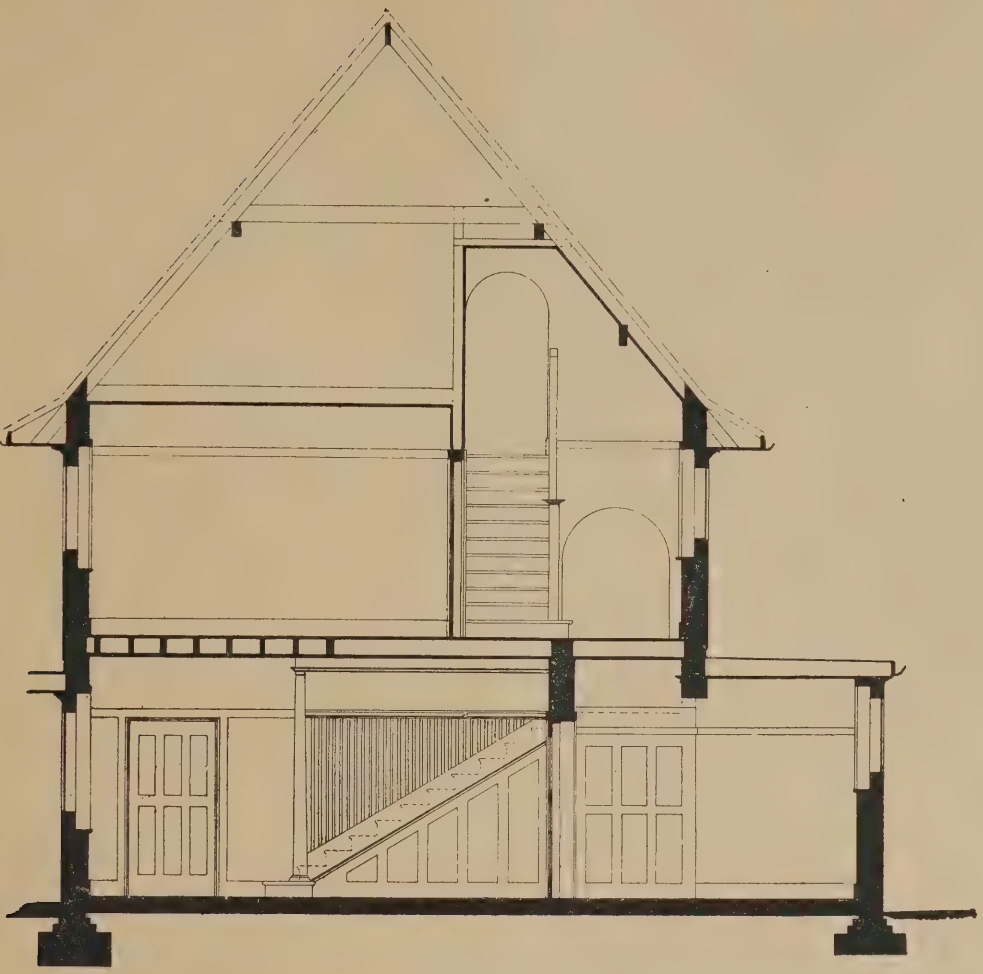
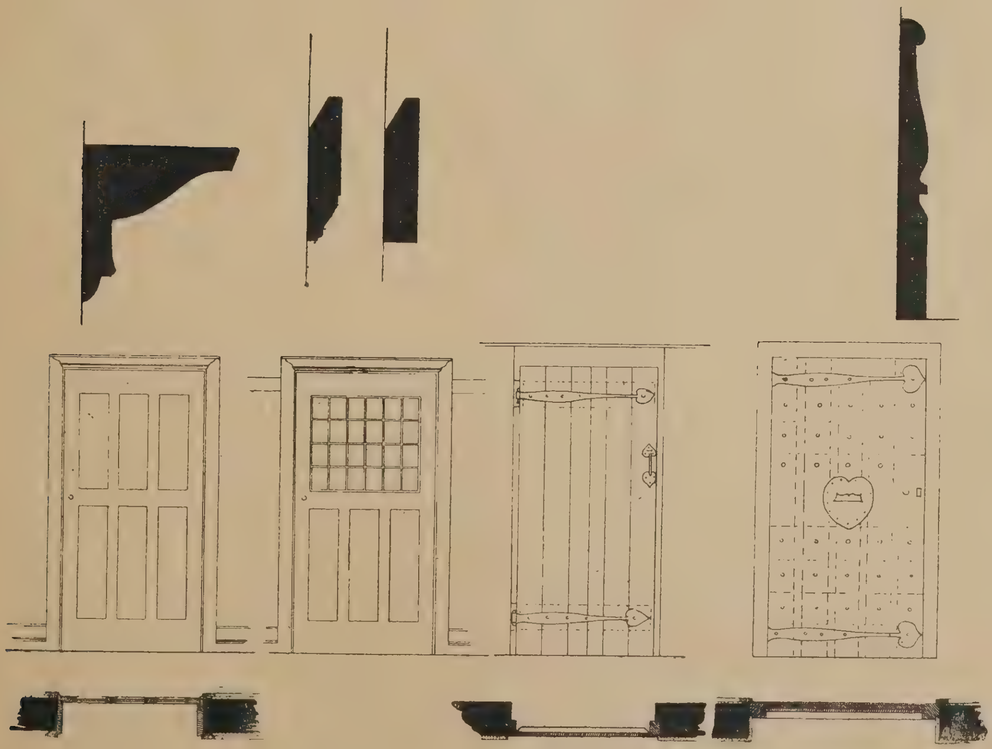




SECTIONS AND DETAILS OF HOUSE NEAR GUILD





FOR MR. JULIAN STURGIS. C. F. A. VOYSEY, ARCHITECT.

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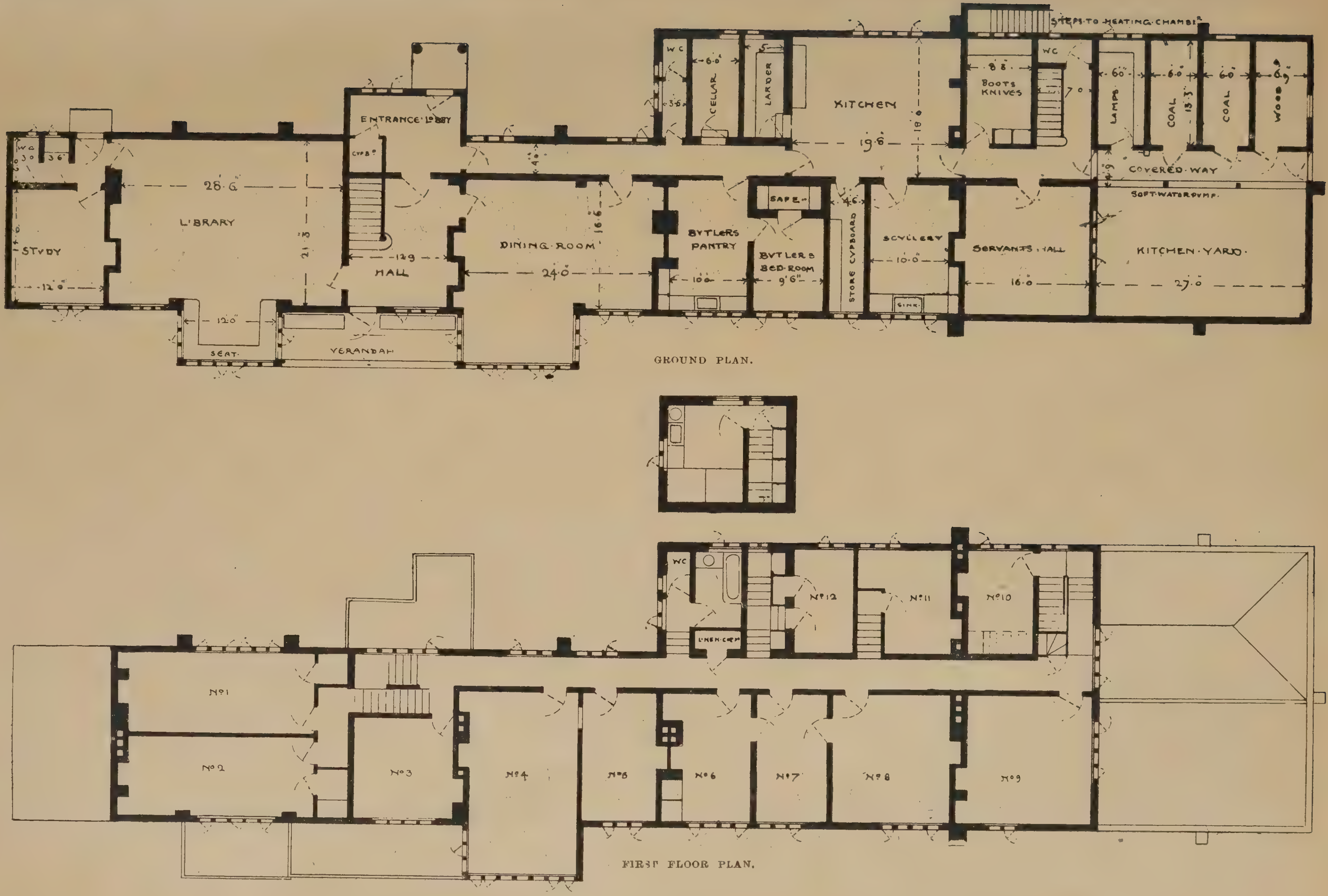

GROUND PLAN.

FIRST FLOOR PLAN.

HOUSE, NEAR GUILDFORD, FOR MR. JULIAN STURGIS. C. F. A. VOYSEY, ARCHITECT.

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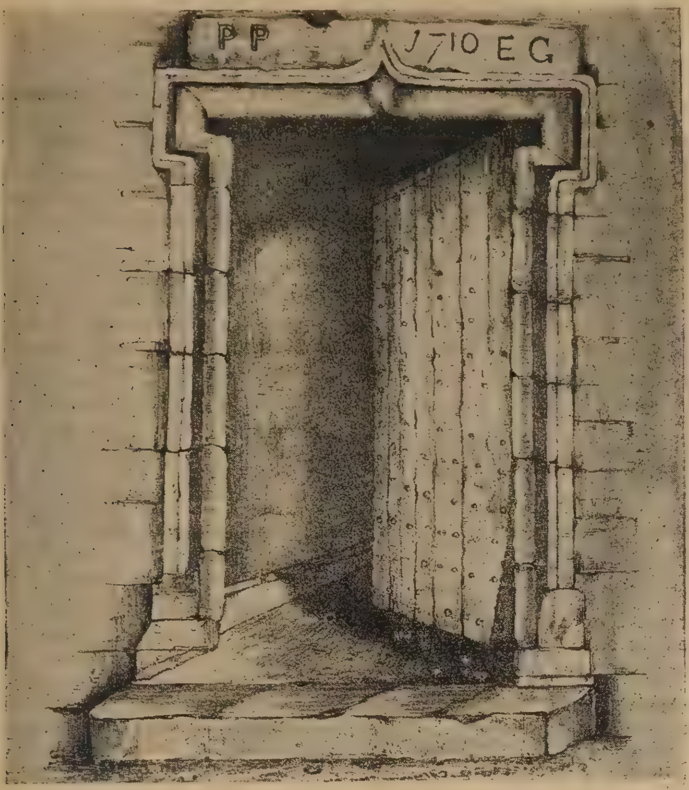


OLD DOORWAY IN QUALITY STREET, LEITH.

THE ARCHITECTURAL ANTIQUITIES OF LEITH.*

By JAMES CAMPBELL IRONS, M.A.

(*Concluded from page 40, No. CCXXXVII.*)

THERE is a very interesting door in Quality Street forming a sort of connecting link between Mediæval and Renaissance. The architrave has the shoulders of the Renaissance very pronounced at the lintel, while the mouldings and the O. G. curve in the centre are reminiscences of the older style. It is dated 1710.

In the same street is the house illustrated on this page; it is a good example of old Scottish domestic architecture. In this house Charles II. is said to have been entertained in 1650.

Near the top of the Tolbooth Wynd an ancient tower stands. It is furnished with little port holes at the top resembling those designed for musketry in our old Border peel-towers and fortalices, but which were constructed here, we presume, for the more peaceful object of watching the owner's merchant vessels as they entered the Firth. An unusually striking piece of sculpture in very bold relief occupies a large panel over the archway leading into the courtyard behind. It bears the date 1678, and amongst sundry other antique objects the representation of a singularly rude specimen of mechanical ingenuity. This consists of a crane, the whole machinery of which is comprised in one large drum or broad wheel made to revolve like the wire cylinder of a squirrel's cage, by a poor labourer who occupies the quadruped's place, and clambers up, Sisyphus-like, in his endless treadmill. The perspective with the grouping and proportions of the whole composition forms altogether an amusing and curious sample of both the mechanical and the fine arts of the seventeenth century.

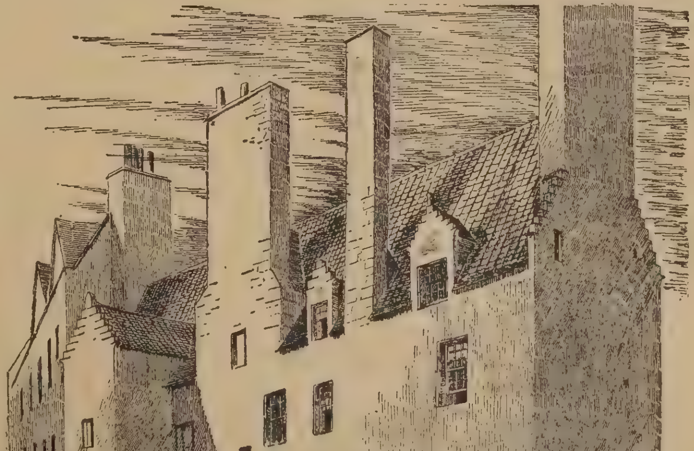
The little building shown on the lower right hand corner, which resembles in its proportions the eastern wing of Aberdeen Castle, is doubtless a view of the porter's lodge or home. It is dated 1673, and bears the letters "C. R.," which, no doubt, meant Charles Rex, who was more than once resident in Leith, and played golf on its links. Two boats with a mast each on the bows are shown, and on the side of the boat is a curious oval cartouche containing what looks like a man on horseback, and beneath the pennant are the initials "C. R.," and on the other the St. Andrew Cross.

The Tolbooth Wynd is probably the second oldest thoroughfare in Leith, and was that which superseded Burgess Close as the approach to the shore. Midway down this stood the Old Tolbooth, erected in 1565, in the reign of Queen Mary. It appears that the magistrates "for a long time denied the Leithers even the luxury of possessing a jail of their own," but the latter having enlisted the sympathies of Queen Mary, she wrote several letters on the subject to the town council—without effect, however. At last, in 1563, she wrote in peremptory terms:—"Wherefore we charge you that ye permit oure said toun of Leith, to big and edific our said hous of justice, within our said toun of Leith, and make no stop or impediment to them to do the samyn, for it is our will that the samyn be biggit, and that ye desist from further molesting of them in time coming, as ye will answer to us thereupon." This had the desired effect, and the building was proceeded with. The edifice was a good specimen of its class, and served its purpose for 250 years. On the upper part of the façade was placed, in recognition probably of her services, the arms of Scotland, with the initials of Queen Mary, bearing the inscription and date in large Roman characters, "M. R. In Defens 1565," with supporters, two unicorns, and pennants having salteres.

"Soon after the demolition of the Heart of Midlothian," says Wilson, "the doom of the ancient Tolbooth of Leith was pronounced, and plans were procured for a new court house and prison. Great exertions were then used by several zealous antiquaries, and particularly by Sir Walter Scott and Charles Kirkpatrick Sharpe, Esq., to induce the Magistrates of Edinburgh, under whose authority the work proceeded, to preserve the picturesque and venerable façade, while the remainder of the building could be demolished and rebuilt according to the proposed plan. The proposition was treated with the usual good taste of our civic reformers. A deputation who waited on my Lord Provost to urge their petition were cavalierly dismissed with the unanswerable argument that the expense of the new designs had already been incurred, and so the singular old house of justice of Queen Mary was replaced by the commonplace erection that now occupies its site." This nondescript building, totally unfit for its purpose, was afterwards converted into shops and offices.

What is called the "Shore," or Quay of Leith, extends from the Tower southward to the foot of the Tolbooth Wynd, and contains many quaint old buildings. A view is given of the door and staircase window of No. 10, which bears the date 1678, with the initials "R. M." No. 28 is the Old Ship Hotel, and No. 20 was the New Ship Tavern, the lower flat of which is shown in the Rotterdam view of 1700 exactly as it is now. Above its doorway can be traced a Latin motto from Psalm cxxvi, ingeniously adapted to the calling of the house: *Ne dormitat custos tuus. Ecce non dormitat neque dormit custos domus.* "He that keepeth thee will not slumber. Behold he that keepeth the house (Israel) shall neither slumber nor sleep."

One of the finest specimens of seventeenth or early eighteenth century architecture still surviving in Leith is that of a doorway on



HOUSE IN QUALITY STREET, LEITH.

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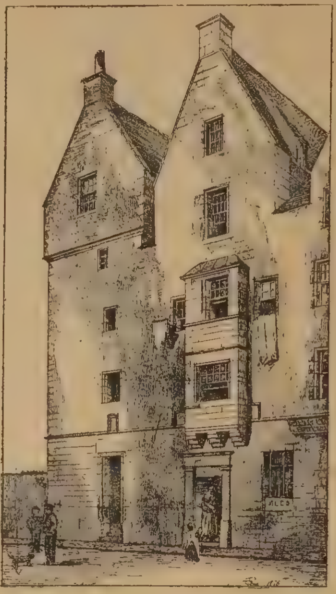
* A paper read before the Edinburgh Architectural Association on March 8th, 1899.

the Shore. The letters forming the monogram are "J. G." and "B. M.," which might be the initials of John Gladstone and his wife. The date 1711 is carved on the pediment. This suggestion is made because his place of business was in the immediate locality.

Another house on the Shore is a very early and good example of the Renaissance architecture of Scotland, when the native genius was completely crushed out and the foreign style of the time adopted. The period to which it belongs is the close of the sixteenth century or opening of the seventeenth century. It was one of the finest specimens in the country of pure Renaissance architecture, and, I regret to say, has been demolished to give place to the common tenement prevalent today.

There is an old house in Water Lane which still happily stands. Those interested in ancient Scottish architecture should take an early opportunity of seeing it. It is hoped that someone will make a measured drawing of it. It presents a gable to the south, and the splaying and angling of corners, so much indulged in by the sixteenth and seventeenth century architects, the sort of thing which reaches its culminating effect in Anniesfield Tower in Dumfriesshire, has been here given effect to in full with much ingenuity. It is probably the finest specimen of old architecture in Leith.

The ground on which the chapel and the neighbouring tenements were erected is styled in a charter of Queen Mary, dated 1559, "the liberty of the north side of the Water of Leith, commonly called Rudeside," a term attributable to its connection with the Abbey of Holyrood. The remains of the chapel still occupy the ancient site on the banks of the Water of Leith, but very little of the original structure is in existence, probably no more than a meagre portion of the basement wall on the north side, where a small doorway, with an elliptical arch appears, now built up and partly sunk into the ground. The remainder of the structure cannot be earlier than the close of the sixteenth century, and the date on the steeple is 1675. It is the same kind of tower as adorned Glasgow College, and is to be found on the town house of Dumfries, erected by Banck, a well-known architect of this period. He erected the tower of Dumfries, and probably designed this also. He was a native of Alloa. A large sculptured lintel belonging to the edifice has been rebuilt into a more modern tower of the church, erected apparently in the reign of Queen Anne.



COUNCIL CHAMBER OF LENNOX, MAR AND MORTON ON COAL HILL.

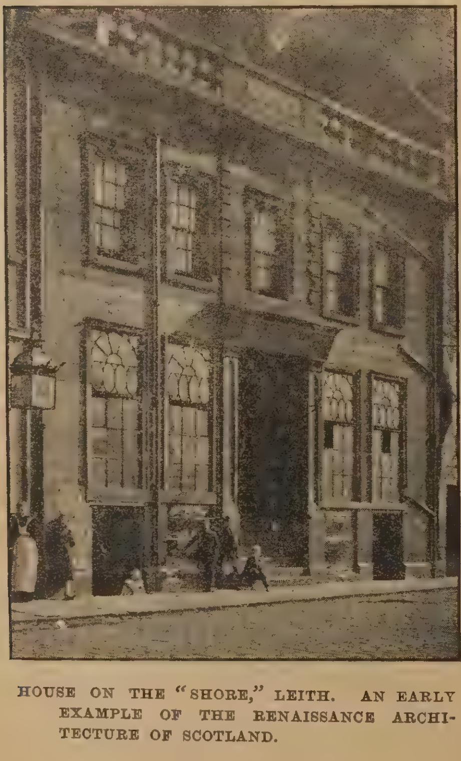
By the charter of Queen Mary, which confirmed the rights that had been purchased by the inhabitants from Lord Holyroodhouse, the chapel of St. Ninian was erected into a church for the district of North Leith, and endowed with sundry annual rents and other ecclesiastical property, including the neighbouring chapel and hospital of St. Nicholas and their endowments. An Act of Parliament was obtained in 1606, creating North Leith a separate and independent parish, and appointing the chapel to be called in all time coming the "Parish Kirk of Leith benorth the brig." Dr. Robertson says that when Dr. David Johnston was called to be minister of North Leith, he entered into an arrangement with the session without any consent on the part of the inhabitants, by which he vested himself and his session as trustees of the parish in the management of the funds. In 1812, when the new church of North Leith was being built, the session and incorporations of the assumption of this agreement, entered into a mutual engagement, the grounds whereof were revived so recently as 1828, when a submission was made to Sir James (afterwards Lord) Moncrieff, then Dean of Faculty, who gave an opinion that matters should not be disturbed, assuming the arrangement to be binding on the parties at the time; and such is the position of matters at the present day.

On the 19th August, 1561, Queen Mary arrived with her two vessels in Leith Roads at 7 a.m. of a dull day. She was accompanied by her three uncles of the House of Guise, the Duc d'Aumale, Monsieur d'Amille, her gentlewomen, called the four Maries, Stroyzi and Brautome, and many persons of less note. She was received on her landing by the Lord James, her natural brother, and many of the chief nobility.

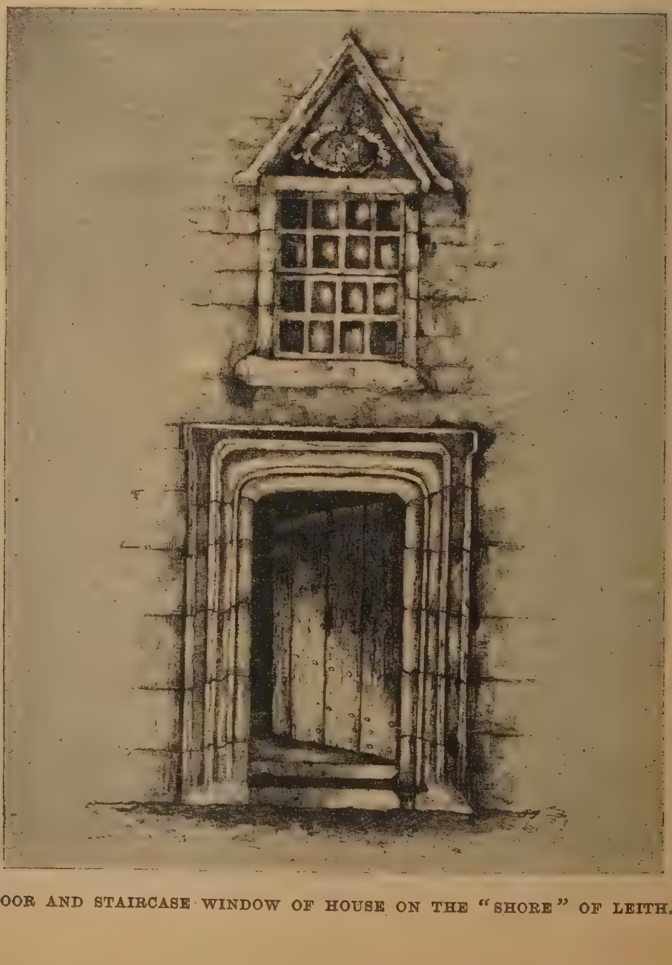
On the 22nd of August the Earl of Moray was proclaimed Regent. On the 23rd January, 1570, he was shot by James Hamilton, of Bothwellhaugh, in the streets of Linlithgow; he was immediately taken to the palace, where he died at midnight. His corpse was conveyed to Stirling, and thence by water to Leith, and afterwards brought to Holyrood House. His funeral took place on the 14th of February in the High Church of St. Giles, where he was buried in St. Anthony's aisle.

His successor in the regency was Matthew, Earl of Lennox. He established his headquarters at Leith, and his council chamber in the old tenement on the Coal Hill. It was decorated with a rose, the emblem of his connection with Henry VIII. of England, and the thistle for Scotland.

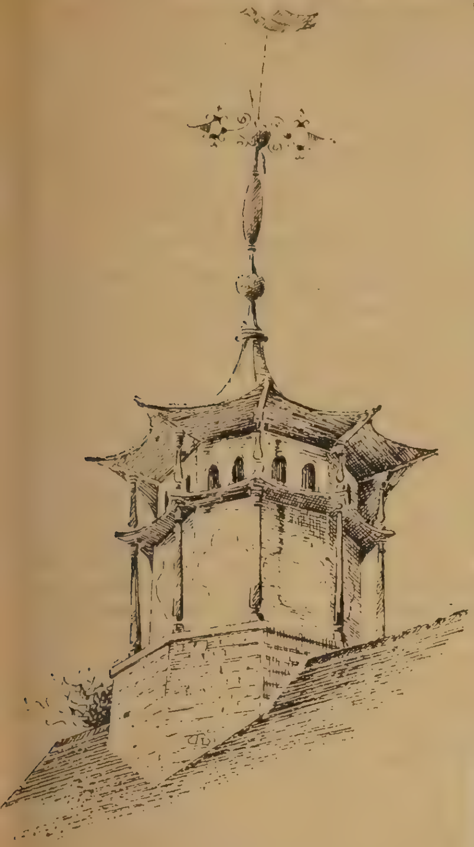
A difference of opinion existed with reference to the precise situation of this council chamber, but Dr. Robertson, who took great pains to ascertain the truth about the matter, remarks:—"This building—the council chamber of Lennox, Mar and Morton—is situated on the 'Coal Hill,' and is even now not so inferior in external decorations as to make it in any way contemptible to the antiquarian observer. In its 'bright and palmy days' it must have been something far above the general class of buildings. I have compared



HOUSE ON THE "SHORE," LEITH. AN EARLY EXAMPLE OF THE RENAISSANCE ARCHITECTURE OF SCOTLAND.



DOOR AND STAIRCASE WINDOW OF HOUSE ON THE "SHORE" OF LEITH.



DOVE-COT ON A HOUSE IN LEITH.

it more especially with Lady Stair's celebrated house, and others in the High Street of Edinburgh, and have little hesitation in giving it the preference. It is not now to be seen in the same condition in which it was in 1835, when its interior, although divided and subdivided, still gave indications of former grandeur, sufficiently artistic to induce admiration. The 'Peak Neux,' or Parliament Square, due south of this tenement, has, in modern times, been called Lennox's Council Chamber and Queen Mary's abode. These illusions we are necessarily compelled to dispel, as we are creditably informed that the ornate and highly decorated cornices in these now miserable tenements were executed under the order of a shipmaster of the name of Maclure about the year 1775, or a little later." The old council chamber of Lennox was removed some years ago in accordance with a scheme of improvement.

This house, which was very lofty, had a commanding aspect and gave a most dignified look to the whole locality. It was divided into two lofty gables, surmounted with chimneys which were not mere imitations of each other but differed in their detail. There is a very fine projecting window supported on corbelling and carried up two storeys. The thing most like it now in Scotland is to be seen in the north side of Linlithgow Palace. The house, which latterly fell on evil days and evil times, was finely furnished in the interior with a good deal of delicately moulded woodwork. There was hardly anything better of its class in Scotland. It was demolished only about ten years ago.

According to Maitland, "Mary of Lorraine, having chosen Leith for her residence, erected a house at the corner of Quality Wynd in the Rotten Row, but the same being taken down and rebuilt, the Scottish arms, which were in front thereof, are erected in the wall of a house opposite thereto, on the southern side." (Book VIII., p. 496.) Robertson says: "With Maitland, whom we have found more correct than other observers of his day, we are inclined to believe that the site of this building was in Water Lane or 'Rotten Row,' where the northern portion of the tobacco warehouse presently stands. The only existing relic of the palace is in the writer's possession—the elegantly sculptured arms of the house of Guise, quartered with those of Scotland. This stone was long preserved in the Old Tolbooth. On its demolition, the materials, with the Scottish arms of Queen Mary, were sold to the contractor, but an attempt was very creditably made by the authorities of Leith to preserve these memorials, and I have been told that our late much respected provost, James Reoch, Esq., succeeded in 1820 in effecting their recovery, he being at that time one of the bailies. They were thereafter deposited in a slaughter-house behind the New Tolbooth, and were afterwards carried to a warehouse in Bernard Street, where they remained until 1844, when they were accidentally discovered at the very moment that the stones were under the blow of the mason's hammer, to furnish material for building the partition wall of a cellar." The two stones were rebuilt by Dr. Robertson into the original window of St. Mary's Church, which was purchased by him on the alteration of the church, and were re-erected at his residence in Albany Street, North Leith.

The extremely picturesque Dove Cot, shown on this page, is situated in one of the most uninteresting streets in Leith. And yet it would be difficult I suppose to design anything more appropriate for its purpose. It is built of wood with lath and plaster. There is a broad-shaped shelf for the birds all round, supported by elegant slim-turned balusters, and above this a wide projecting roof imitating and repeating, but on a slightly larger scale the shelf, and from this a curved roof sweeps up and grows into a most handsome finial. It is a mere trifle, but it has that complete mastery about it which appears to be so prominent in the woodworks of Japan and China.

Cemetery Extension at Dalry.—At a special meeting of the Parish Council on Tuesday last week, the offers for the work in connection with the cemetery extension were considered. It was decided to accept the offer of Mr. Edward M'Corvie, of Kiluruning, amounting to £1,012 9s., exclusive of rock-cutting.

A New Technical School at Louth was opened on Thursday. The building is in Queen Anne style of architecture. On the ground floor are two spacious lecture rooms, measuring 27ft. by 17ft.; also a room for manual instruction, the dimensions being 27ft. by 19ft. There is also the head master's room and various offices. Upstairs is the art room, measuring 41ft. by 27ft., which is lofty and admirably adapted to the purposes; there are also a chemical laboratory, 26ft. by 13ft., and a lecture room for chemistry and electricity, 27ft. by 19ft. The contractors are Messrs. Mawer Bros. The total cost of the building is about £1,452.

ST. NINIAN'S CHAPEL, NORTH LEITH.

Bricks and Mortar.

Aphorism for the Week.

"No man is born into this world whose work is not born with him; there is always work, and tools to work withal, for those who will."—James Russell Lowell.

The Royal Exchange Frescoes. The offending advertisements at the Royal Exchange will shortly be no more. We called attention last week to the incongruity of advertisements being cheek by jowl with works of art. The Gresham Committee evidently recognises the incongruity, and has now definitely decided to abolish all the advertisements. Many of them have already been removed. Of course, some of the advertisers who hold long contracts will have to be negotiated with, but it is hoped that an understanding will be arrived at, by which the advertisements may be removed at an early date.

A Wall Paper Combination. Rumours of the formation of a syndicate of wall paper manufactures have been afloat for some time, but it was only recently that clearer information could be obtained on the subject. Those interested in the wall-paper industry know that wall paper, especially the common kind, has been very cheap lately. This has caused the wall paper manufacturers to establish a trust on American lines with a capital of £3,000,000, and a notice has been issued to all dealers throughout the country to the effect that after the 26th inst., no goods will be supplied until the syndicate has commenced its operations. One of the principal objects of the combination will be to put an end to ruinous competition, as it is a well-known fact that manufacturers have endeavoured to out-do one another by flooding the country with cheap paper, the bulk of which was produced at a loss. The syndicate intend, so they say, to make an endeavour to raise the standard of English wall papers by the introduction of more artistic work. There will be no attempt, they say, to unduly force up prices. There can be no doubt that the price of the cheaper papers will go up, and when this happens foreign manufacturers will most likely step in, and by adapting themselves to English requirements will probably break up the combination.

Cost of Workmen's Dwellings. Mr. Graham, the Secretary of the Jarrow Co-operative Society, made some important statements at a meeting recently held under the auspices of the Land and Labour Committee. Mr. Graham stated that the ordinary dwelling houses, suitable for workmen, built by his Society, cost £355 each, while similar dwellings built by contractors were erected for about £255, or £100 less than the co-operators are required to pay. The high price of the houses built by the Co-operative Society, it should be noted, is entirely due to the cost of labour. The co-operators can purchase material on the same terms as the ordinary contractor. According to Mr. Graham, the reason why the co-operators are bled to the extent of £100 per house is that the workman will not give the same value of work per day to the Society as he will, or rather must, give to a private employer. As a provincial contemporary remarks, Mr. Graham's statements are worth the attention of the members of other co-operative societies who have engaged in building operations. It would be interesting to know whether his experience is a usual or an exceptional one.

The Cromwell Statue. Mr. Thorneycroft, R.A., is now putting the finishing touches to the bronze statue of the Lord Protector, who is represented in a standing position and wearing the undress military uniform of the Commonwealth. The work upon the monument in Westminster Hall Gardens is proceeding rapidly. The pedestal is of Portland stone, and reaches a height of about 10ft., the top being level with the adjoining roadway. It is not yet settled when the unveiling ceremony will take place, although it would be appropriate if the event occurred before the end of the year 1899—the tercentenary of the birth of Cromwell. The statue is pronounced to be an excellent likeness and work of art.

Cromwell's Appearance. Although Cromwell is one of those few characters in history whose personality is well known from his portraits, yet it is curious to note how different was the effect produced by his appearance upon his partisans and his enemies. Notwithstanding that portraits of the Protector abound, either in paintings, engravings, or sculpture, yet the genuine likenesses of the man can be reduced to three types. According to Mr. Lionel Cust, Director of the National Portrait Gallery, it seems certain that only three painters can lay any claim to have drawn Cromwell from life—Robert Walker, Sir Peter Lely, and Samuel Cooper. As to sculpture, it is impossible to point to any bust or statue of the Protector which could have been executed from life or during his lifetime. After the Restoration there was a great revival of energy among artists, and decorative sculpture came into demand. Edward Pierce produced a bust of Cromwell, of which there is a terra-cotta model in the National Portrait Gallery. This bust was long believed to have been taken from the life, but as a matter of fact Pierce was not working until twenty years after Cromwell's death. The marble bust recently presented to the House of Commons has been ascribed to Bernini, but he, it is stated, never came to England, and could not have seen the Protector. With the portraits may be classed the so-called death-masks, of which more than one exist.

The Parish Church at Usk. The old priory church at Usk has in it little of the original Norman fabric. The tower that once rose from the centre of the pile now stands at the east of the church, and the formerly surrounding choir and transepts have gone. There is still, however, a fine gatehouse close to the churchyard, but this, with the exception of a few traces, is all that is left of the old buildings. It has been recognised that the church needs repairing, and a local Restoration Committee have taken the matter in hand. Mr. G. E. Halliday, F.R.I.B.A., has reported that the tower, one of the few early Norman examples remaining in the diocese, is fast falling into decay, so much so, in fact, that should the work of reparation be deferred the necessity of introducing new masonry will in a great measure detract from the feeling of the old work, which is now practically in its entirety. The aisle and nave roof are also sadly in need of repair. This work, as well as that of removing the somewhat extensive casing of plaster, will, on a moderate estimate, cost the Restoration Committee £1,300. It is intended to leave the restoration of the choir and transepts until the above mentioned work is done.

Vandalism at Newcastle. It is encouraging to see signs of a growing interest on the part of the non-professional press in matters which concern the beautifying or spoiling of the city. The "Newcastle Daily Chronicle" bemoans, with some cause, the scheme for the erection of "a series of brackets surmounted by a network of live wires," by the New Tramways Committee of the Corporation for the purposes of the overhead trolley system. It mentions about thirty streets which are to be "improved out of recognition," and then sarcastically remarks that it "can only hope that the work of transformation will be commenced before November. It was stated at the last meeting of the committee that no outside work could be undertaken before March. That is nonsense. There is nothing whatever to prevent the Council surrounding Grey's monument with poles and wires at once. Why should not that be done experimentally, and enthusiasm for the Corporation's tramway scheme be thus aroused?"

The William Black Memorial Beacon. It is intended to erect a beacon as a memorial to William Black at Duart Point, Oban, overlooking the waters and the country which are associated with some of his best work. The beacon will be placed on a simple-looking battlemented tower. The Americans are taking an interest in the memorial, Mr. R. R. Fowler, of New York, having promised to make up the amount required to £800, that is after the English subscriptions are all in. Lord Archibald Campbell is the treasurer of the fund and receives subscriptions at Messrs. Coutt's, 59, Strand, W.C. The sketch-design for the Beacon Tower will be more complete when a cresset of the proper form surmounts it.

Country Building By-Laws. How to build a wholesome dwelling at the lowest cost is a problem of national importance, says Mr. G. V. Poore in a letter to the "Times." It will be good news to many to hear that the Local Government Board appears to be ready to sanction a modification of its model by-laws by those bodies which have adopted them, in so far as they prohibit habitations built of wood. But the conditions which the Board seeks to impose upon the builders of wooden houses are somewhat arbitrary. These conditions are:—(1) That the house shall be of one storey only; (2) that its area shall not exceed 600 square feet, nor its capacity 6,000 cubic feet; and (3) that it shall be 200ft. distant from any other building not being in the same curtilage. Conditions 1 and 3 are presumably intended to lessen the risks of fire, which might very well be left to be settled by the owner and the insurance office. The object of condition 2 is not so obvious, and one is curious to know why a wooden cottage with an area of 600 or more feet is to be absolutely disallowed. Condition 3 means that every wooden cottage must stand in about half an acre of ground, while a quarter of an acre has been pronounced by high authority to be the maximum which a man can cultivate in his leisure. The complete want of elasticity in these regulations is very characteristic, and they afford an interesting illustration of the official idea of local self-government. If we are to encourage rural life, it is important not to restrict unnecessarily the use of rural products for building purposes. Local councils which have not adopted building by-laws should certainly pause before doing so.

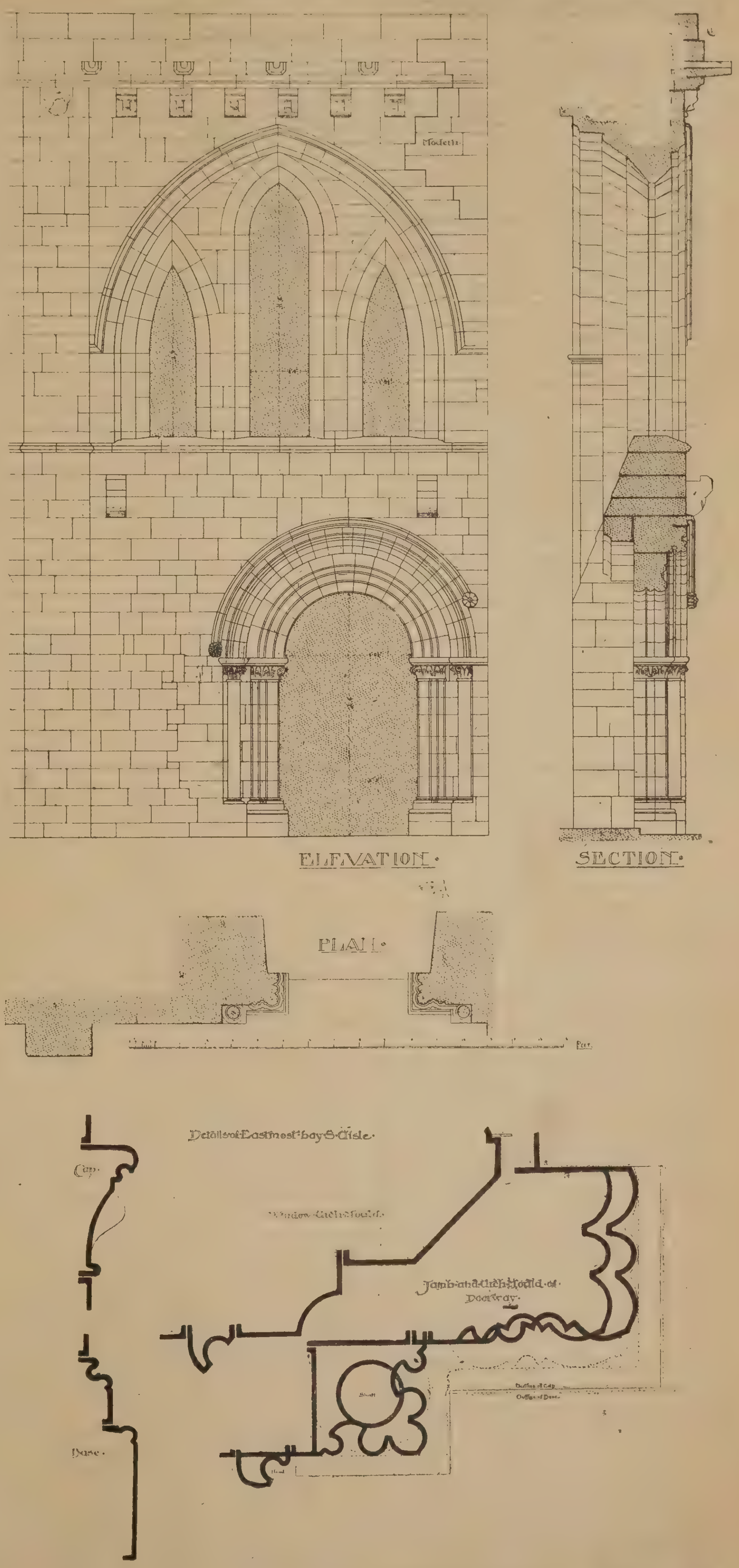
The Improvement of Westminster. The demolition of buildings in Westminster still goes on, and King Street is now closed. The unmarried police, who were lodged in the section house at the back of the old King Street Police Station are to have temporary sleeping accommodation in a large iron building which has been constructed in the forecourt of New Scotland Yard. The Science and Art branch of the Scotch Education Department has been removed from Great George Street to 55, Parliament Street, and the Light Railway Commission has been removed to 54, Parliament Street. The site for the new police station in Cannon Row, upon which the Civil Service Commission building formerly stood, has been cleared, ready for building operations.

The Black Smoke Question. At a meeting of the St. Helen's Corporation Health Committee on Wednesday afternoon, the question was raised as to how long black smoke should be allowed to be emitted from chimneys before a prosecution of the owners of the chimneys was begun. Reports had been presented to the Committee which stated that black smoke had been issuing from certain works for more than five minutes at a time. Alderman Sir David Gamble considered that a five minutes' test was unfair, because it only allowed the same time for a chimney with thirty or forty furnaces as it did for a chimney with only a few furnaces. There was also the question whether the manufacturers where doing their best to abate the nuisance or not. The chairman, Alderman J. Foster, remarked that a five minutes' test was the usual one, and that none of the reported chimneys had more than ten furnaces. Councillor Burchal called attention to the fact that one of the chimneys concerned was that at the Corporation's destructor works at Boundary Road. He suggested that they should look after themselves before dealing with others. The committee evidently thought it prudent not to go any further into the subject, and it was dropped.

Paisley Abbey. The illustrations of Paisley Abbey, here reproduced, are from two sheets of measured drawings by Mr. James S. Boyd, a student in the Architecture Class of the Glasgow and West of Scotland Technical College. Mr. Boyd is a journeyman joiner, who desires to become a clerk-of-works, and these drawings were executed under the superintendence of Professor Gourlay, who is of opinion that such work is of great importance as part of the training of a craftsman for the position of a clerk-of-works. They represent the doorway and window which form the easternmost bay of the south aisle of the nave of the abbey. The doorway led into the cloister, which was pulled down by the municipal authorities several years ago, so as to widen the adjoining street. The roof of the cloister was supported on the corbels which are seen above the door, in the elevation and section. The arch of the door is very nearly a semicircle. This part belongs to the oldest portion of the abbey.

The Old Gate Tower of Lincoln's Inn. The old gate tower in Chancery Lane, one of the few remaining ancient landmarks in London, is now undergoing renovation and repair. The work is being carried out under the direction of Mr. Dennett H. Barry, the surveyor to the Honourable Society of Lincoln's Inn. About 4ft. of stone coping and parapet walls of the two towers facing Chancery Lane will be taken down and the brickwork will be repointed. The original old oak gate will also be repaired. Great care is to be taken that no structural alteration or change will be made in the appearance of the tower, which is stated to be structurally strong. The tower was built during the reign of Henry VII., and in the rooms over the gateway Oliver Cromwell is stated to have once occupied chambers. The wall of Lincoln's Inn was commenced in the reign of Queen Elizabeth, and it is said that Ben Jonson worked thereon as a mason. Prior to the erection of this wall, the site of which is now occupied by chambers, Lincoln's Inn was separated from Chancery Lane by an embankment only.

Unlucky Birmingham. St. Laurence's Church, Dartmouth Street, Birmingham, has long been in need of the repairs and alterations it is now receiving at the hands of Messrs. Franklin, Cross and Brookes, architects, but it was not known until last Wednesday that the whole floor of the church is rotten. The workmen in the progress of excavation actually found the joists reduced to fine powder. The reason for this is that no ventilation was allowed for when the church was built. A very heavy item of expense will now be added to the contemplated cost of repairs, and it is to be hoped that the Birmingham Churches Fund will be able to make some grant towards the effort now being made to put the edifice into thorough repair, as the vicar and churchwardens cannot proceed with the contract work until the floor has been put right. St. Laurence's has only been built about thirty-five years, and yet its iron work in that time has been corroded and eaten away by the acids in the neighbourhood. We wonder how many more Birmingham churches are in a like condition.



A DOORWAY AND WINDOW AT PAISLEY ABBEY. MEASURED AND DRAWN BY JAMES S. BOYD.

Professional Practice.

Aberdeen.—A commencement has been made on the work of pulling down the greater part of Glenkindie House, belonging to Captain Leith, preparatory to the erection of a new house on a larger scale. The only parts of the present building to be retained are the two small wings at the right and left of the front. The main block to connect these, with its ornamental spurs and projecting wing at the back containing the kitchen and attendant accommodation, is to be rebuilt from the foundation. The building will be embellished with various effective architectural features—projecting oriels at certain points and baronial towers rising in front at the intersection of the front wings and main block. The main building will be three storeys in height. Some small portions will be of two storeys, and the kitchen wing will be one storey. The new building will be constructed principally of the freestone that abounds in the Auchindoir and Rhynie districts. The contract for the mason work, which will amount to about £6,000, has been placed in the hands of Mr. Edgar Gauld, of Aberdeen. The contract for the joiner work, which amounts to nearly £3,000, will, it is expected, go to Messrs. M'Robbie and Milne, of Aberdeen. The architects are Messrs. Sydney Mitchell and Wilson, of Edinburgh. The entire work, which is likely to occupy about two years, is expected to cost from £12,000 to £14,000.

A new block has been added to the City Hospital from designs by Mr. John Rust. The extension is 76ft. from the north front to the junction on the west with the administration block. It is almost the same width, and the building encloses an open central area, by means of which a plentiful supply of light is obtained on the side for the block as a whole. In the centre of the north front is a campanile tower which rises four-square above the adjacent roofs, and attains, including the finial, to a height of nearly 50ft. The tower has a curve roof, covered with green slates and surmounted with an effective crown finial. From each side of the central tower the front stretches out, four windows on each side, on both floors, and the angles are marked by channelled ashlar pilasters, while an open granite balustrade forms a cresting along the top of the walls. The main south entrance of the administration block forms also an entrance to the new addition. One part of the extension—along the east side of the ground floor—is isolated from the rest of the block, and is reserved as an addition to the reception, bathing and discharge accommodation for patients. On the ground floor, along the west side, is a dining-hall for ward maids and four servants' bedrooms. Along the north front on this floor runs a series of three bedrooms for laundrymaids, joining at the north-east corner the isolated portion of the block. The accommodation on the upper floor is entirely devoted to bedrooms, &c., for nurses and others of the staff. The structural furnishings of the new portion are of pitch pine, and the corridors on both floors have a dado of the same wood to a height of 4ft. The lavatories, &c., are tiled. The contractors are: Mason, Mr. Leslie Smith; carpenters, Messrs. Leslie and Hay; plasterers, Messrs. J. Bannochie and Sons; plumber, Mr. John Anderson; slater, Mr. John Farquhar; painter, Mr. Philip, Huntley Street; bell-hangers, Messrs. Florence and Son; heating, Mr. R. Tindal. The furniture is being supplied by Mr. Wishart, cabinet maker. The cost is between £4,000 and £5,000.

Barrow.—A new Wesleyan Methodist church has just been opened in Abbey Road, Barrow. The church has a broad nave, two transepts, chancel, narthex organ chamber, choir vestry, ministers' vestry, and class-room, with a church parlour above to hold 130 persons, and having direct lift connection with a kitchen in the basement next the heating chamber. The main elevation is faced with Yorkshire parsepts, there are transept and end galleries, points and St. Bees red stone dressings. At the Abbey Road and Brighton Street angle of the church, a tower has been designed, containing the steps leading to the end gallery over the narthex, and surmounted by a spire rising about 100ft. from the ground. At the other angle an additional entrance without a porch is provided. The internal woodwork in roofs, ceilings, benches, screens, &c., is in selected pitch pine. The windows and screens are glazed with ornamental lead work. The entrances, narthex, and chancel are tiled. The church will be heated with hot water on the low pressure system, and the lighting will be by means of an electrical installation. In addition to the seats in the nave and tran- which altogether will provide accommodation for about 750 worshippers, including a choir of twenty-four in the chancel. On the left hand side of the church a school has been designed with infants' rooms and three class-rooms to seat 410 scholars, and about 685 for meeting purposes. The main school will be provided with a gallery at one end. The church has been built from the designs of Messrs. William Waddington and Sons, of Manchester, and the work has been carried out by local tradesmen.

Brighton.—At the Brighton County Court last Tuesday week, Judge Martineau heard a case in which Robert William Pollard, architect, of 11, Prince Albert Street, Brighton, claimed from Tom Bovey, licensed victualler, of the "Sir Richard Steele" Hotel, Haverstock Hill, London, £8219s. 8d. for architect's work in connection with the re-building of the Quadrant Hotel, Brighton. There was a counterclaim for £170 for alleged drunkenness and inefficiency. Mr. Matthews, for the plaintiff, stated that in May, last year, defendant acquired the Quadrant Hotel, Queen's Road, by purchasing the lease and had the premises, which were extremely dilapidated, practically re-built. To plaintiff was entrusted the work of preparing plans and specifications—a very delicate task considering the age of the building and the difficulty of planning how the new work should fit into the old. Plaintiff charged for preparing plans and preliminary work to go before the Building Committee of the Town Council, preparing tracings, interviews with solicitor, and attending before the Licensing Justices, and preparing plans for the work at 5 per cent. on the estimate (£1,639), a third being deducted on account of plaintiff being relieved of the supervision of the work. The question was whether the £82 19s. 8d. was a fair remuneration for the work done. The plaintiff said he carried out the work as stated by Mr. Matthews, but after a time was informed that his services were not required. He knew from what the defendant had told him that tenders were obtained upon his specification. Mr. Drury, for the defendant, said that no terms were arranged beforehand. The defendant stated that he told the plaintiff that he did not intend to spend more than £1,000 on the building, and the plaintiff distinctly said he would charge 5 per cent. inclusive on the accepted tender. He began to complain to plaintiff of the work being behind about the end of September. The plaintiff was, on many occasions when he came to take measurements, so intoxicated as to be unable to do so. Estimates were obtained on plaintiff's specifications, the lowest being £1,639, but the work was eventually done for £1,355. He estimated that through the delay that occurred he had lost something like £15 or £20 a week. Other witnesses were called to prove the alleged intemperance, which was denied by the plaintiff, and Mr. Drury submitted that there was a definite agreement—5 per cent. to cover everything—and that there had been most unreasonable delay. Mr. Matthews submitted that, even had there been a special contract for five per cent., it had been rendered void by defendant dismissing plaintiff, and that there was no case of delay. His honour held that the defendant had failed to prove the alleged intemperance. He did not think that plaintiff was remarkably diligent in getting out the plans; but yet it could not be said that for a great portion of the time there had been delay upon which he could give damages, for it should be remembered that the plaintiff had had two tribunals to pass—the Licensing Committee and the Building Committee. He did not see any ground whatever for sustaining the counterclaim, and therefore dismissed it, with costs. As to the claim, he was not satisfied that there was a special contract, and the defendant had failed to prove this. He allowed ten guineas for measuring the old building and attending before the committee, and £40 of the rest of the claim, £50 10s. altogether, with ordinary costs of counsel.

Dudley.—A new theatre, to be called the "Dudley" Opera House, is to be opened in about a week's time. The theatre has been built from the plans of Mr. A. Ramsell, architect, of Dudley. It is built in the Italian Renaissance style, with a frontage of 150ft., and a height, from the ground level to the symbolic figure on the apex of the façade, of 66ft. It is brick-built, with terra-cotta dressings, and will seat 2,000 persons. The stage is exceptionally large, its width being 72ft. 6in., its depth from the footlights to the back wall 36ft., and its height, from the floor-line to the "grid-iron," 50ft. The distance from the footlights to the last row of the gallery is 87ft., ~~whilst the height from the pit~~ floor to the dome in the ceiling is 41ft. The auditorium ceiling is designed in relief, with centre dome painted with sky effect, and the fronts of the dress circle and amphitheatre are in keeping, the prevailing colours being cream and gold. The whole of the building will be lighted by electricity.

Minehead.—A new infant school has just been completed according to plans prepared by Mr. W. J. Tamlyn, architect, of Minehead, which provides a large room, with a class-room and a cloakroom adjoining, to accommodate 160 infants. The building is constructed of local red brick, with patent self-lock roofing tiles on roof. The whole is well lighted and ventilated, and warmed by means of open fire grates on the Teale principle. All internal woodwork is stained and varnished. The total cost was about £560, including boundary walls.

Ystrad Meurig.—A new church, erected to the memory of Edward Richard, was consecrated by the Bishop of St. David's on Wednesday. The new building stands on the site of the old church, which had been in ruins for half-a-century. The old church had no architectural pretensions. The portion of the new church just completed consists of a nave, chancel and organ chamber. A western tower and vestry will be added as soon as the necessary funds have been raised. The chancel is raised two steps above the nave, and is entered under a bold and massive stone arch, being separated from the nave by a low stone dwarf screen. The sanctuary is raised two steps above the chancel, while the holy table is further elevated. In the south wall of the sanctuary are a credence niche and sedilia formed in the window recess. The pulpit forms a part of the structure, being entered under an arch formed in the north respond of the chancel arch. The wrought-iron grilled altar rail is placed at the entrance of the sanctuary. The architecture of the work is based upon fifteenth century style. The stone dressings are worked in red Hollington stone, the main part of the walls being built with good local stone. The massive timber roofs and all the internal woodwork are stained malachite green, of various shades. The passage, chancel and sanctuary floors are formed of red tiles. The font is placed near the western door. The roof is of red slates. The architect is Mr. Harold Hughes, A.R.I.B.A., and the contractors are Messrs. Charles Davies and Co.

Improvements at Stamford Park.—A Local Government Board inquiry was held on Wednesday at Ashton-under-Lyne Town Hall into the application of the Ashton-under-Lyne and Stalybridge Corporations to borrow jointly between £18,000 and £20,000 for improvements at Stamford Park. There was no opposition to the application.

Keystones.

The Loan Exhibition of Pictures at Deptford was opened by Mr. Justice Darling last Monday week.

A New School at Brecon for boys and girls is to be erected at a cost of £5,670 by Mr. T. E. Morgan, of that town.

A New School and Master's House at Ashwater, Devon, is to be built by Mr. W. Ball, of Okehampton, at a cost of £1,595.

Opening of the Atbara Bridge.—The ceremony of opening the Atbara Bridge for free passage was performed by Lord Kitchener on Saturday.

A New Workhouse Chapel at Upton-on-Severn is to be erected at a cost of about £450. The foundation stone was laid last Thursday by Lady Johnson.

Accident in Thackley Tunnel.—In the course of excavations to widen Thackley Tunnel, a large stone fell on a man named James Kelly, of Park Road, and fractured his left thigh.

The Latest London Hotel is the "Tudor," which stands at the corner of Oxford Street and Dean Street. It is a red brick building faced with terra cotta. The architects were Messrs. Pilditch, Chadwick and Co.

A Fatal Accident.—An ironworker named John Law was killed at Messrs. Johnson's works in Church Lane, West Bromwich, on Thursday morning. He was struck on the head by a beam which fell from the roof.

The Roumanian Exhibit at the Paris Exhibition of 1900 will be of considerable importance. The building in which it is to be housed will symbolise the national arts and industries of Roumania; the architect is M. Formigé.

A New Hall at Aberfoyle.—A new hall was opened recently, which has been erected at the expense of Mr. William Forrest, a local grocer. The new hall is 40ft. by 20ft., and provides dining accommodation for 250 persons.

A New School at Walsall was formally opened on Monday, last week. When completed it will accommodate 390 boys, 330 girls, and 350 infants, but at present only the mixed school, which provides for 765 scholars, has been erected. The style is a free Renaissance, and the designs were prepared by Messrs. Bailey and McConnal, the builder being Mr. W. Wistance. The cost is £8,666.

Fatal Scaffold Accident at Huddersfield.—Last Tuesday week Walter Schofield, foreman mason, of Rothwell Street, Moldgreen, who was in the employ of his brother, Alfred Schofield, contractor, of Dalton, fell from a chimney of a new building in Wheatstone Road. He sustained a fracture of the skull and of the shoulder, and died soon after his admittance to the infirmary.

The N.A.P. Window Co., Ltd.—At a meeting of the creditors of this company, held on Friday last, it was apparent that a scheme of reconstruction was likely to be carried through. A further adjournment of two months was therefore made to allow the scheme to mature. It was stated, however, that the receiver had made arrangements whereby all the orders were having prompt attention and would be executed as heretofore. We hope the proposed arrangements will be successfully carried out, as there can be no doubt that the company owns a number of really valuable patents.

A Statue of Burns in America.—The Burns Club of Barre, Vermont, U.S.A., has just erected a granite statue of Burns. The figure was modelled by Mr. J. Massey Rhind. On the pedestal are four panels representing, respectively, "The Cotter's Saturday Night," "Burns's Cottage," "Tam O'Shanter's Ride," and Burns at the plough, illustrating the poem "To a Mountain Daisy." On the top of the die are carved the rose, thistle, and blue bells. The total height of the monument is 22ft. 10in., and everything in connection with it is of Barre granite. The four panels were modelled by Mr. James B. King.

The Pavilion in Cathnays Park, Cardiff, erected for the purpose of the recent Eistedfodd, which was in process of demolition, suddenly collapsed on Wednesday morning. A man named Chappell was seriously injured, and another man was slightly hurt.

A New Infectious Diseases Hospital for Lincoln.—Mr. L. W. Darra Mair, one of the inspectors of the Local Government Board, held an inquiry last week into the application of the Urban Sanitary Authority for permission to borrow £1,167 for the purchase of land for a site for a hospital for infectious diseases.

Public Baths and Fire Brigade Station at Heckmondwike.—The Heckmondwike District Council have decided to apply to the Local Government Board for permission to borrow a further sum of £2,850 for the purpose of completing the public baths and fire brigade station, and £14,000 for the electric lighting scheme.

A New Infirmary and Nurses' Home at Tendring.—For the erection and completion of the new infirmary, nurses' home, &c., on the grounds adjoining the present Union Workhouse at Tendring, the tender of Mr. F. Thurman, Walton, near Ipswich, £10,799, has been accepted. The architect is Mr. Frank Whitmore, of Chelmsford.

The Gladstone Statue for Glasgow.—The Executive Committee of the Glasgow Gladstone Statue Fund met on Monday, last week, in the City Chambers, Glasgow. The sub-committee recommended that Mr. Thorneycroft, R.A., be entrusted with the work, and the Executive endorsed this decision. The total sum at the disposal of the committee is £3,500.

New Municipal Buildings at Clydebank.—At a meeting of the Clydebank Dean of Guild Court last Tuesday week, permission was asked by the Burgh Commissioners for the erection of municipal buildings on a site in Dumbarton Road. The plans were passed. The buildings will consist of public halls, municipal offices, police offices, public baths, and a fire brigade station. They are estimated to cost about £27,000.

Brickworks Accident at Howden.—An accident occurred recently at the Northumberland Brickworks, Howden, by which two men, named Joseph Wardle, of South Shields, a joiner, and Robert Hall, of North Shields, a labourer, received very severe injuries. It appears that these two men were working inside one of three kilns, which were just finished, and were removing the battens, when the whole of the kilns collapsed, and the men were buried underneath a large quantity of bricks and other debris. Several others received slight injuries.

New Primitive Methodist Church and Schools at Harrogate.—The trustees of the Primitive Methodist church and schools, Cheltenham Parade, Harrogate, have sold their present buildings and decided to erect a new set, the foundation stones of which will be laid on Tuesday, the 5th September. A plot of land has been secured on the Dragon Estate, opposite the new technical and art schools and fronting Bower Road. In addition to a handsome Gothic church, there will be commodious schools, lecture hall, and a complete suite of vestries. The total estimated cost is £8,000.

Accident at Windsor Castle.—While some men in the employment of Messrs. G. Cooper and Son, contractors to the Queen, were decorating a portion of the south corridor at Windsor Castle, last Tuesday week, a plank of the scaffold upon which they were standing suddenly snapped, and they fell a distance of about 12ft. to the floor Two of them escaped with a shaking, but Webb, the foreman, and Anscombe, a painter, were injured. Anscombe, whose left leg had been fractured below the knee, was promptly removed by the Lord Chamberlain's employés on a Castle ambulance stretcher to the Windsor Royal Infirmary, where he was attended to by Dr. Steele, the house-surgeon. Webb's injuries were of a less serious character, and after being seen by Dr. Casey he was conveyed to his home.

A New East Window has been placed in Greenhow Hill Church, Yorks., in memory of the late Vicar. The window was designed by Mr. C. E. Tute, and is of three lights.

Extensions to King Alfred's College, Taunton.—A new chapel and domitory at King Alfred's College, Taunton, is to be erected from designs by Mr. W. E. Tower, of 9, Queen Anne's Gate, Westminster, S.W.

A New Chapel at Loughborough was opened last Wednesday. The chapel is constructed principally of iron and wood, and has been erected at a cost of over £1,000. It will provide accommodation for 200 worshippers and 240 Sunday scholars.

A New Theatre at Camden Town.—A new theatre is to be erected in the High Street, Camden Town, N.W., by Mr. W. Wallis, at a cost of £25,000, from designs by Mr. W. G. Sprague, of Fitzalen House, Arundel Street, W.C.

Professor Hubert Herkomer has been made a Foreign Knight of the Prussian "Ordre pour le Merite" for Science and Art. There are not more than eight of these Orders given to foreigners, and the only other living English artist who has had the honour bestowed upon him is Sir Laurence Alma-Tadema.

Fatal Accident at a Quarry.—A man named Edward Hughes was killed by the fall of a piece of rock weighing about two tons, in Moelfferna Quarry, near Llangollen, on Wednesday morning. His head was completely crushed. Two other workmen were severely injured, but are favourably progressing.

A Dinner to Sir Laurence Alma-Tadema will be given in November next by his friends in celebration of the knighthood lately conferred upon him. Mr. Onslow Ford will be the chairman, and Messrs. Frank Dicksee, E. Waterlow, A. C. Gow, M. R. Corbet and others will form the dinner committee.

New Infectious Diseases Hospital for Linlithgow.—The competitive plans of Messrs. John Melvin and Son, architects, of Alloa, for a new infectious diseases hospital to be erected at Linlithgow have been accepted by the Joint Committee of the Burgh and District Committee of the County Council. Accommodation will be provided for twenty-four beds, and the estimated cost is between £6,000 and £7,000.

Troon Sea Wall.—The necessary permission having been obtained from the Court of Session for the Duke of Portland to convey to the Burgh Commissioners the ground required for the sea wall, which is to extend along the whole length of South Beach, the work will now be commenced. The contractor for the undertaking is Mr. Thomas Christie, of Stirling, and the contract price is £7,449 10s.

The Excavations at Tara have just been visited by a party of antiquaries, who found that a discovery of striking interest had been unwittingly made in the course of searching for the ark. Deep below the mound which marks the base of the former royal palace, and below the former level of the field, have been found remains of a structure cut in solid rock, and indicating the existence of a fortress dating from a period far earlier than the legendary history of Tara, as commonly known. As at Troy, there appear to have been successive layers of habitations on the same site.

Mr. George Wragge intimates that he has purchased the business recently carried on by Mr. John E. Carr under the name of "The Crafts" at Longsight, Manchester, and that, after having made special arrangements to retain Mr. Carr as manager and art director, he has now transferred the business to premises adjoining his metal works at Salford. Mr. Wragge has just been invited by the Commissioners to supply the stained glass and casements to one of the important rooms in the Royal Pavilion at the Paris Exhibition. He has taken the work in hand. Mr. Wragge has also opened offices in the Bigg Market, Newcastle-on-Tyne.

New Patents.

The following abridged description is specially drawn up for the Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., from whom all information relating to Patents, Designs, and Trade Marks, may be obtained free of charge.*

9450. Drains.—Patentee: J. Morgan, of Sunnybank, Pontardawe, Swansea. Ventilating manholes. A small chamber is built in the manhole and fitted with an air-inlet grating. The air passes to the drains by a pipe, the flow being regulated by a valve.

23,767. Roofing-tiles.—Patentee: G. E. Evans, of Church Street, Bridgetown, Cannock, Staffordshire. Longitudinally-curved tiles, with hanging nibs or projections, are moulded between curved dies. Recesses are made in the end of the convex die to receive the plastic material forming the ribs.

9335. Tiling ceilings, walls, &c.—Patentee: W. Hewitt, of Victoria Tile Works, Hereford. Semi-circular recesses in the edges of the tiles engage with flanged studs projecting from strips supported by rabbeted slats fixed to the ceiling or other surface. The joints between the edges of the tiles may be made straight or of other suitable shape, and the slats may be rectangular in cross-section. In some cases headed studs are screwed into the slats, joists, or woodwork, and slotted washers are slipped on the studs, and can be turned in the grooves in the tiles.

9433 Windows; window holders.—Patentee: H. G. Stratford, of Fanshaw Street, Newtown, Southampton. At each side of the frame two toothed wheels are mounted on pivots, and are provided with barrels on which is wound a chain passing round a sheave of a balance-weight. The toothed wheels gear with racks fixed to the sashes, and are locked by pins which pass through holes in the frame and between the teeth of the wheels. When either sash is lowered the chains are wound up, and the balance-weights are raised. The pins lock the sashes in any required position. A removable panel or pocket-piece is fitted in the frame at each side.

New Companies.

Glenyards Fire-clay Company Limited.

This company was registered with a capital of £4,000 in £1 shares (500 five per cent. preference) to adopt an agreement with Mr. David Graham, brick manufacturer, Falkirk, and to carry on the business of brickmakers, quarrymasters, &c. Registered office: Glenyards, Bonnybridge, Stirlingshire.

Southall Development Syndicate, Limited.

This company was registered on August 17th, by Mr. C. F. Twist, of 5, Bedford Row, W.C., with a capital of £15,000, in £1 shares, to acquire the Hambrough Estates, at Southall, Middlesex, and to carry on the business of landowners, builders, &c. The first directors (to number not less than three nor more than five), are to be appointed by the subscribers. Qualification, £500. Remuneration as fixed by the company.

Shawford South Down Estate Limited.

This Company was registered on August 15th, by Messrs. Morgan and Co., of 33, Old Broad-street, E.C., with a capital of £20,000 in £1 shares, to acquire and deal with any land, house, and other property, and to carry on the business of builders, financiers, &c. The first directors (to number not less than three nor more than six) are to be appointed by the subscribers. Qualification, £100. Remuneration as fixed by the company.

Blænycwm Slate Quarry Company, Limited.

This company was registered on August 16th, by Messrs. Waterlow Brothers and Layton, Limited, of Birchin's Lane, E.C., with a capital of £6,000, in £5 shares, to adopt an agreement with Mr. George Watson for the acquisition of the business carried on by him at Blænycwm, Carnarvon, and to carry on the business of quarrymen, &c. The first directors (to number not less than two nor more than five), are Messrs. George Watson, David Watson and James Morgan. Qualification, 10 shares. Remuneration as fixed by the company.

Nesbitt Brothers.

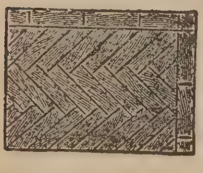
This company was registered on August 23rd, by Mr. T. C. Houston, 43, Lower Sackville Street, Dublin, with a capital of £2,000 in 400 £5 shares, to acquire and take over as a going concern the business of Messrs. Nesbitt Brothers, engineers, of Belfast, and to carry on the same. Directors are to number not less than three nor more than five, the first being Messrs. Thomas Hunter Nesbitt, James Hope Nesbitt, sen., William Courtney Nesbitt and James Hope Nesbitt, jun. Registered office: 24 and 26, Townsend Street, Belfast.

Julius Sax and Co., Limited.

This company was registered on August 21st, by Messrs. Francis and Johnson, of 19, Great Winchester Street, E.C., with a capital of £18,000 in £1 shares, to acquire the electrical undertakings of Messrs. Julius Sax and Co., Limited (incorporated in 1892), to adopt an agreement with Mr. H. M. Salmony, and to carry on the business of electricians, electrical engineers, electric light contractors, &c. The first directors (to number not less than three nor more than five) are Messrs. G. Arbuthnot, L. C. F. Oppenheim and H. M. Salmony. Qualification, £1,000.

Caledonian Copper Company, Limited.

This company was registered Aug. 1st, by Messrs. William and Co., of Winchester House, E.C., with a capital of £750,000 in £5 shares, to acquire, upon the terms of a certain agreement, the copper mines known as the Pilou and Ao Mines, situate in the Diahot district of New Caledonia, and to develop and work the same; and, further, to carry on in all or any of their respective branches the business of builders and contractors, quarry owners, brick and tile makers, engineers and iron founders, colliery owners, and coal merchants; to acquire any other mines, mining, water, and other rights, grants, leases, claims, concessions, options of purchase, alluvial ground, &c., in any part of the world, and to develop, deal with, work and turn to account the same in such manner as the company shall see fit; to develop the resources of lands acquired by the company by clearing, draining, planting, farming, and building thereon; to lay out towns and villages; to acquire and turn to account any patents, patent rights, and inventions, &c. The signatories (each one share) are Messrs. P. S. Bruff, A. J. Romeril, W. R. Rolfe, A. W. Phillips, R. S. Lowe, J. J. Taylor and E. M. Cope. The first directors (of whom there shall not be less than three nor more than seven) are to be elected by the signatories. Qualification, £200. Remuneration: Chairman, £500; ordinary directors, £250 each.



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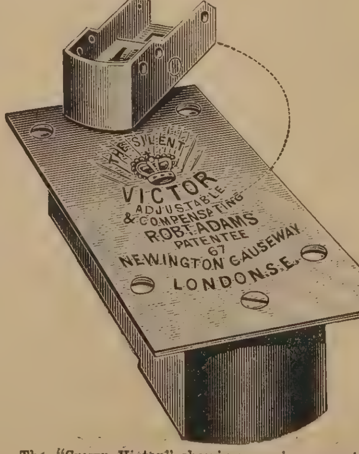

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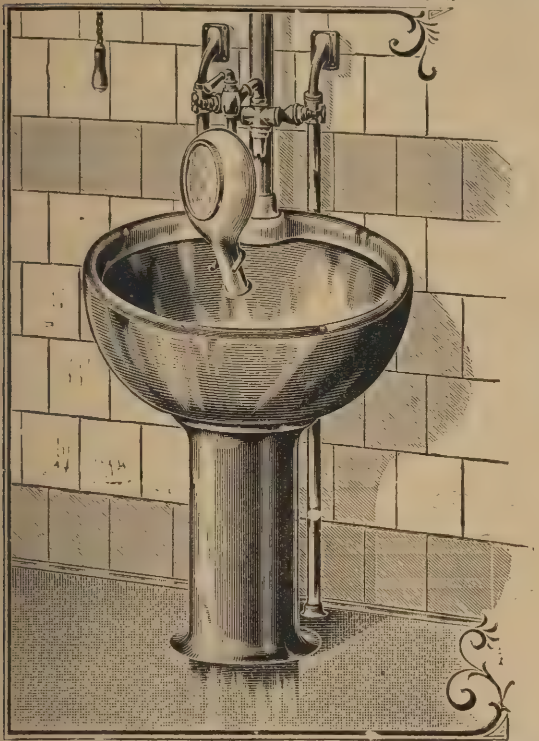

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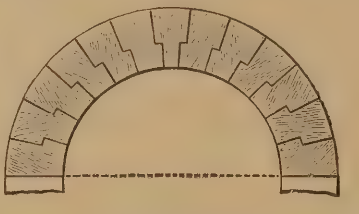
AN IMPROVEMENT IN ROMAN ARCHES.

The heading of these remarks is in a sense quite an anomaly. It is true that the Romans have been credited with inventing that very useful part of architectural construction, without the utilisation of which a tunnel would be practically impossible. But the Romans were always plunderers, so it is not remarkable that they acquired the idea of arch construction from Egypt, where the modern method of arching roofs was in active working at least four thousand years ago. After such a lapse of time it appears almost ridiculous for an individual to come forward and suggest that the true method of arch construction is not yet known. Nevertheless, we have recently had submitted to us an idea which may possibly be of great importance to the building community. Our illustration shows a section of an arch composed of a kind of dovetailed brick, which can be made of clay, terra-cotta, or other material. The interlocking is so contrived that every brick becomes a keystone. Should it turn out that this new form of brick only partly carries out the claims of the two collaborating inventors, their efforts may result in such a development of engineering stability, as regards the construction of bridges, culverts, &c., as is hardly thought of at the present time. In the case of a badly made arch, when one brick falls the whole erection is at once liable to collapse, but according to the claim of Messrs. Grayson and Spratly, the patentees of this design, their bricks can be so interlocked, in a variety of ways, that whether used for ornamental arches, or colossal viaducts and tunnels, the result must be such a welding of the material into a solid mass that the structures should be as enduring as those of the ancients. This ingenious contrivance was introduced to us by one of the patentees, Mr. Spratly, of 32, Bridge Road, Hammersmith, W.



COMING EVENTS.

Wednesday, Aug. 30, to Saturday, Sept. 23.

Sanitary Institute.—Eighteenth Congress and Health Exhibition at Southampton.

Monday, October 2.

Worshipful Company of Carpenters.—At the Carpenters' Hall, London Wall, E.C. Commencement of evening classes in building construction, drawing, and quantities. Architectural lectures at the King's College, London. Particulars can be obtained from the Secretary at the College, or from Mr. S. W. Preston at Carpenters' Hall.

Monday, October 9.

Worshipful Company of Carpenters.—At the Carpenters' Hall, London Wall, E.C. Commencement of evening classes in architectural and constructional drawing, quantities, surveying, &c., and lectures on architectural construction at the University College. Particulars can be obtained from the Secretary at the College, or from Mr. S. W. Preston at Carpenters' Hall.

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		£ s. d.	£ s. d.
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Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 5 8	1 16 2
Colza Oil, English ...	per cwt.	1 3 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 8 9	1 9 0
Linseed Oil	per cwt.	1 1 3	1 1 6
Neatsfoot Oil	per gal.	0 2 6	0 4 0
Petroleum, American ...	per gal.	0 0 6 1/8	0 0 6¼
Do., Russian ...	per gal.	0 0 5 1/8	0 0 5¼
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 5 0	1 7 3
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 3 6	—
Glue	per cwt.	1 14 0	2 18 6
Lead, white, ground, carbonate	per cwt.	0 19 0	—
Do. red	per cwt.	0 17 3	—
Soda crystals	per ton	2 15 0	—
Shellac, orange	per cwt.	3 4 6	3 5 0
Do. sticklac	do.	2 2 6	2 15 0
Pumice stone, ...	do.	0 8 9	—

METALS.

Copper, sheet, strong ...	per ton	76 0 0	—
Iron, bar, Staffs. in London	do.	8 10 0	9 0 0
Do. Galvanised Corrugated sheet ...	do.	13 0 0	13 10 0
Lead, pig, Spanish ...	do.	14 16 3	—
Do. English common brands	do.	15 3 9	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	16 10 0	—
Do. pipe	do.	17 5 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 0 0	10 0 0
Do. floor brads	do.	8 15 0	9 15 0
Tin, Foreign	do.	141 2 6	142 10 0
Do. English ingots ...	do.	143 10 0	—
Zinc, sheets, English ...	do.	140 0 0	28 10 0
Do. Veille Montaigne ...	do.	31 0 0	—
Do. Spelter	do.	24 5 0	24 12 6

TIMBER.

Soft Woods.

Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	do.	4 0 0	6 10 0
Deals, Archangel 2nd & 1st	per P. Std.	16 10 0	—
Do. do. 4th & 3rd.	do.	12 0 0	12 5 0
Do. do. unsorted	do.	12 5 0	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	10 10 0	16 0 0
Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	10 0 0	10 15 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	9 5 0	16 10 0
Do. White Sea	do.	13 0 0	—
Do. Quebec Pine, 1st...	do.	18 0 0	19 0 0
Do. do. 2nd	do.	12 0 0	—
Do. do. 3rd &c.	do.	7 15 0	9 15 0
Do. Canadian Spruce, 1st	do.	9 0 0	10 5 0
Do. do. 3rd & 2nd	do.	6 5 0	7 15 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	7 10 0	8 5 0
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Do. 2nd...	do.	0 6 9	0 10 3
Do 3rd &c.	do.	0 7 9	—

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Cedar, lin., Cuba	per ft. sup.	0 0 4	0 0 4½
Do. Honduras	do.	0 0 3¼	—
Do. Tobasco	do.	0 0 4¾	0 0 5½
Elm, Quebec	per load	4 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 29/32	—
Do. African ...	do.	0 0 3 5/8—3½	
Do. St. Domingo ...	do.	0 0 5 9/32	—
Do. Tobasco ...	do.	0 0 4 15/16—6 1/32	
Oak, Dantzic and Memel	per load	3 5 0	3 5 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	9 5 0	15 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 2 6	0 4 2

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work. An asterisk (*) signifies accepted.

ABERTILLERY (Mon.).—For additions, &c., to school, for the Aberystruth School Board. Mr. R. L. Roberts, architect, Victoria-chambers, Abercarn. Quantities by architect:—

Wm. Smith	£2,000 0 0	Wm. Phillips ...	£1,550 0 0
D. Lewis	1,975 0 0	J. Jenkins, Newport*	1,525 0 0
A. P. Williams...	1,877 16 0		
Gaen Bros.	1,663 3 5		

BRIGHTON.—For the erection of twenty-eight artisans' dwellings, St. Helen's-road, for the Town Council. Mr. F. J. C. May, C.E., Town Hall, Brighton:—

Hallett and Duke...	£7,594 0	Sattin & Evershed, Freshfield-road, Brighton*	£7,135 0
Hother and Co. ...	7,462 14		

BRISTOL.—For the erection of four houses, Kingswood. Mr. T. J. Moss-Flower, C.E., Scottish-buildings, Baldwin-street, Bristol:—

S. Williams...	£765 12	Willis and Willmott, Hanham, near Bristol*	£638 10
J. Davis...	745 0		

BYFLEET.—For the erection of a detached house at Byfleet, Surrey, for Mrs. Alice Charles. Mr. Wm. G. Jones, architect, Broadway, Woking:—

Greenfield	£1,128	C. Horsell, Weybridge*	£980
W. B. Young...	1,085		

CARDIFF.—For the erection of mission hall, Cathays, for the Presbyterian Forward Movement. Messrs. Habershon, Fawckner, and Groves, architects, Pearl-street, Cardiff:—

F. Williams ...	£3,400 0 0	G. Hallett	£3,085 4 0
Shepton and Son	3,235 0 0	G. Griffiths	3,030 0 0
Beer and Sons ...	3,228 0 0	T. Evans	2,994 18 2
H. Gibbon	3,200 0 0	D. Thomas	2,979 0 0
Price Bros.	3,165 0 0	Handford and Elsworthy* ...	2,930 0 0
Evans and Bros.	3,140 19 2		

[All of Cardiff.]

GRIMSBY.—For laying pipe-sewer, Welholme-road, for the Urban Sanitary Authority. Mr. M. Petree, C.E., Town Hall-square, Grimsby:—

Chas. Simons... ...	£199 15 9	Hewins & Goodhand, Grimsby*	£187 18 0

HARROGATE.—For paving, &c., Dragon-parade and other roads, for the Corporation. Mr. S. Stead, Borough Surveyor, Municipal Offices, Harrogate:—

John Dunn, 15, Beresford-terrace, Harrogate £3,466 14

HARROW.—For the supply of granite road metal (1,000 tons), for the Urban District Council. Mr. Edgar Lines, surveyor, Council Offices, Harrow:—

The Enderby and Stoney Stanton Granite Company, Narborough, nr. Leicester.*

	s. d.	
1¾-in. granite at	12 6	per ton.
2-in. "	12 0	"
1-in. granite chippings at...	8 6	"
¾-in. " "	8 0	"

* Accepted.

HASTINGS.—For the erection of boundary walls, &c., St. Helens, for the Corporation. Mr. P. H. Palmer, C.E., Town Hall, Hastings:—

G. Barton, 8, Perth-road, St. Leonards*... ... £425

ISLEWORTH.—For making up, kerbing, &c., Worple-road, Isleworth, for the Heston and Isleworth Urban District Council. Mr. W. A. Davies, C.E., Town Hall, Hounslow:—

Nowell and Co....	£1,931 0 0	Ball	£1,543 7 1
Chapman	1,624 0 0	Mowlem and Co., Westminster*	1,466 0 0
Lawrence and Thacker	1,622 19 6		

ISLEWORTH.—For the supply of Norwegian granite kerbing and channelling, &c., for the Heston and Isleworth Urban District Council. Mr. W. A. Davies, C.E., Town Hall, Hounslow:—

Griffiths	£18,643 6 6	Walker and Co.	£15,897 14 6
Hobman & Co.	17,991 18 0	Ball	15,235 17 3
Nowell and Co.	17,898 17 0	Mowlem and Co., Westminster*	13,871 0 0
Lawrence and Thacker ...	17,302 7 6		
Sommerfield ...	16,199 14 0		

LISNASKEA (co. Fermanagh).—For the erection of five cottages for the Rural District Council:—

John Bloomfield, jun., Brookehoro*	£666 15
Patrick O'Neill‡	536 16
James Cox§	394 0

‡ For four cottages. § For three cottages.

KEIGHLEY.—For the erection of a foundry, Green-gate Mr. John Haggas, architect, North-street, Keighley:—

Masonry.—Slater and Waddington, Ingrow, Keighley*	£1,173
Joinery.—Timothy Hird, King-street, Keighley*	
Slating.—Wm. Thornton, Bingley*	
Plumbing.—William Lambert, Haworth* ...	
Ironfounding.—John Barrell, Crosshills* ..	
Patent Glazing.—Heywood and Co., Huddersfield*	

LONDON, S.E.—For the erection of two shops at Trafalgar-road, Greenwich, for Mr. Gordon. Mr. Alfred Roberts, architect, 18, Nelson-street, Greenwich, S.E.:—

Henry Bridle	£1,475	Jones and Groves ...	£1,388
William Mills	1,439		

LONDON, S.E.—For alterations and fittings to premises, Trafalgar-road, East Greenwich, for the London and Provincial Bank, Ltd. Mr. Alfred Roberts, architect, 18, Nelson-street, Greenwich, S.E.:—

Jones and Groves* £247

LONDON, N.W.—For coal order office, West Hampstead, for Messrs. Herbert Clarke, Ltd. Messrs. Potts, Son, and Hennings, architects:—

Sumner and Co.	£439	Mattock Bros....	£359
E. Green	386	Lapthorne and Co.* ...	354

LONDON, W.—For pulling down and rebuilding premises, Nos. 5 and 6, Candover-street, exclusive of sanitary and drainage work. Messrs. Clarke and Hutchinson and Percy A. Boulting, joint architects, 28, John-street, Bedford-row, W.C.:—

Smith and Co.	£3,464	Burman and Sons ..	£3,169
Patman and Fotheringham	3,452	John Anly and Son ...	3,139
Holloway Bros.	3,190	A. A. Webber*	2,997

MIDDLESBROUGH.—For the erection of electricity works, for the Corporation. Mr. R. Hammond, C.E., 64, Victoria-street, S.W.:—

Buildings.	
Cook, Stockton-on-Tees*	£10,280
Piling and Foundations.	
Ridley and Sons, Middlesbrough*	3,019
Total	£13,299

NORTHAMPTON.—For the erection of fourteen houses for Mr. I. E. Pearse. Mr. H. H. Dyer, architect and surveyor, 1, Sheep-street, Northampton:—

Geo. Fisher	£6,087	E. D. Sharman & Sons	5,588
Wingrove and Stanly	5,992	A. P. Hawlin...	5,569
H. Martin	5,880	J. M. Panting	5,500
J. Garrett	5,772	Wilson and Alright ...	5,427
A. J. Chown	5,625	W. Heap*...	5,417

[All of Northampton.]

PONTEFRACT.—For alterations to shop and house, Ropergate, for Mr. Stuart Lowden. Messrs. Garside and Pennington, architects and surveyors, Pontefract:—

Walker and Ward, Mill Hill, Pontefract... £316 5 6

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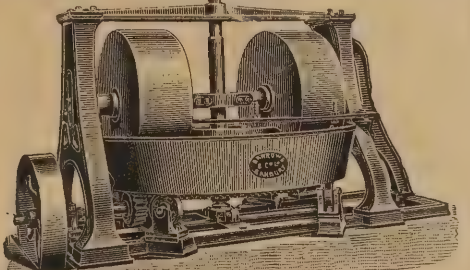

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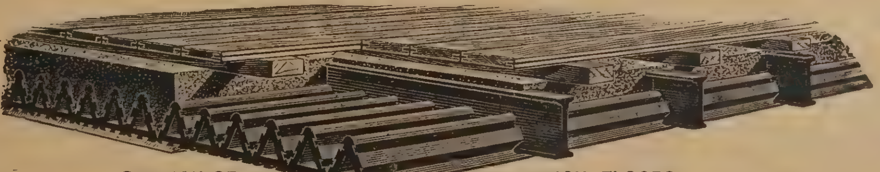

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PONTEFRACT.—For the erection of two shops, North Featherstone, near Pontefract, for Mr. W. Jowitt. Messrs. Garside and Pennington, architects and surveyors, Pontefract, Castleford, and Selby:—

	£	s.	d.
Bricklaying.—Grudill, South Gate, Pontefract*	£117	12	9
Slating.—Stuart and Son, Jubilee-place*	20	10	0
Plumbing.—Thos. Leng, Ropergate*	20	5	6
Plastering.—J. Shaw, Ropergate*	11	2	6
Painting.—Thrall, Horsefair*	4	0	0

[Joiner's work not included in contract.]

PURSTON.—For house and shop to be erected in Purston, near Pontefract, for Mr. Fred Williams. Messrs. Garside and Pennington, architects and surveyors, Pontefract:—

	£	s.	d.
Bricklaying.—A. Taylor, Pontefract*	£140	0	0
Joinery.—Thos. Ward, Pontefract*	70	0	0
Plumbing.—H. Foster, Pontefract*	15	8	0
Slating.—G. Spurr, Pontefract*	17	15	0
Plastering.—J. W. Senior, Pontefract*	10	12	6
Painting.—T. Burton and Son, Pontefract*	4	3	0

RIPON.—For the execution of sewerage works, Ure Bank, or the Rural District Council. Mr. H. A. Johnson, M.Inst.C.E., Bradford:—

	£	s.	d.
F. W. Simpson, Burton Leonard, Leeds	£160	10	6

ROBIN HOOD'S BAY (Yorks).—For additions, &c., to police station. Mr. Walker Stead, C.E., County Surveyor, Northallerton:—

	£	s.	d.
Langdale & Sons	£263	0	0
J. Gladstone	222	10	0
Atkinson and Co.	207	9	8
R. P. Botton, Bilsdale, Middlesbro'*	£197	10	0

ROTHERHAM.—For the erection of bakehouse, Northfolk-street, for the Masborough, &c., Co-operative Society. Mr. J. E. Knight, architect, 33, College-street, Rotherham:—

	£
G. Pugh	£305
Robert Snell	286
Richard Snell	282
Chadwick and Co.	254
J. Earnshaw	£229
J. Cooper, Rawmarsh-road, Rotherham*	220

SHEFFIELD.—For making a road, Crookes. (First Contract). Mr. J. P. Earle, architect, Norfolk Chambers, Norfolk-row, Sheffield:—

	£
J. Eyre	£388
J. E. Nadin, Sheffield*	362

STOCKLEY HEUGH (Durham).—For the erection of eight cottages, for Mr. W. Lishman. Mr. H. T. Gradon, architect, 22, Market-place, Durham:—

	£	s.	d.
C. Groves	£1,521	1	4
M. R. Draper	1,400	0	0
G. T. Manners	1,338	0	0
T. Walton	1,308	14	6
T. Coates	£1,252	9	3
W. Lodge, Pity Me*	1,240	5	0

SUNDERLAND.—Heating to new technical college. Messrs. Potts, Son, and Hennings, architects:—

	£
Vaux and Sons	£600
Emley and Sons	575
Matthews and Yates	561
Dargue, Griffiths & Co.	£471
Russell and Co., London*	450

WOKING.—For the erection of shop and stabling, Guildford-road, Woking, Surrey, for Messrs. Lascelles, Tickner, and Co., Limited. Mr. Wm. G. Jones, architect, Broadway, Woking. Quantities by Mr. John Scott, surveyor, 23, Bedford-row, W.C.:—

	£
Ingram and Son	£2,031
A. A. Gale	1,957
J. Whitburn	1,923
G. Hooker	£1,885
Harris and Son, Woking*	1,847

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LEYTON URBAN DISTRICT COUNCIL

TO CONTRACTORS AND OTHERS.

PUBLIC STREET IMPROVEMENTS.

The Leyton Urban District Council invite Tenders for PAVING, CURBING, and CHANNELLING over the Great Eastern Railway Bridge, Leyton Station.

Specifications, quantities, and forms of Tender may be obtained on and after Monday, the 28th inst., on application to Mr. WILLIAM DAWSON, M.Inst.C.E., the Council's Surveyor, at his Offices, Town Hall, Leyton, between the hours of TEN and FOUR (Saturdays, TEN and TWELVE).

Sealed Tenders, in specially endorsed envelopes supplied with the forms, accompanied with a £10 Bank of England Note enclosed with the Tender, to be forfeited if the Tender is withdrawn before the contract is signed, must be delivered at the Town Hall, Leyton, on or before TUESDAY, SEPT. 5th next, at FOUR p.m.

The Council does not bind itself to accept the lowest or any Tender.

Sureties will be required for the due performance of the contract.

R. VINCENT.
Town Hall, Leyton. Clerk to the Council.
August 26th, 1899.

PARISH of FULHAM.

INFIRMARY PAINTING AND CLEANING CONTRACT.

Notice is hereby given that the Board of Guardians of the Parish of Fulham, are prepared to receive TENDERS for INTERNAL PAINTING, DISTEMPERING, and other WORKS, at their Infirmary, St. Dunstan's-road, Hammersmith, W.

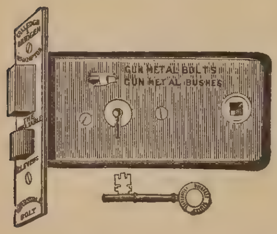
The specification and conditions may be perused, and forms of Tender obtained, at my Offices, any day between the hours of TEN a.m. and FIVE p.m., upon the deposit of £1 1s. sterling, which will be returned to persons sending in bonâ-fide Tenders.

Tenders made out on the prescribed form and properly sealed, and marked on the outside "Tender for Painting, &c.," are to be delivered at my office, not later than ELEVEN o'clock in the forenoon on THURSDAY, SEPTEMBER 14th next, at which time the Guardians will proceed to open and consider the same.

Persons tendering, or their duly authorised agents, must be then in attendance.

The Guardians do not bind themselves to accept the lowest or any Tender.

By order,
T. APLIN MARSH.
Guardians' Offices, Clerk to the Guardians.
Fulham Palace-road,
Hammersmith, W.,
August 22nd, 1899.



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METHODS OF PILING FOUNDATIONS.

By G. Ellis.

TIMBER piles are used as the foundations of buildings where the site to be covered is either waterlogged or has a soft silty surface strata, covering firm ground some distance below. In the first instance, sheet piling is employed. This consists in surrounding the site with a wall of comparatively thin timbers to a depth dependent upon the amount of water in the soil, and the weight of the building to be erected. The object is to prevent the soil running out under the load, which it would otherwise do, and very unequally, according to the different load on different parts of the building. If possible, the site is drained before the building is commenced.

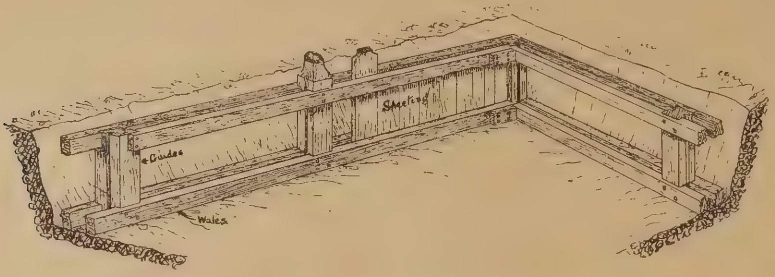


Fig. 1.—A sheet-piled site.

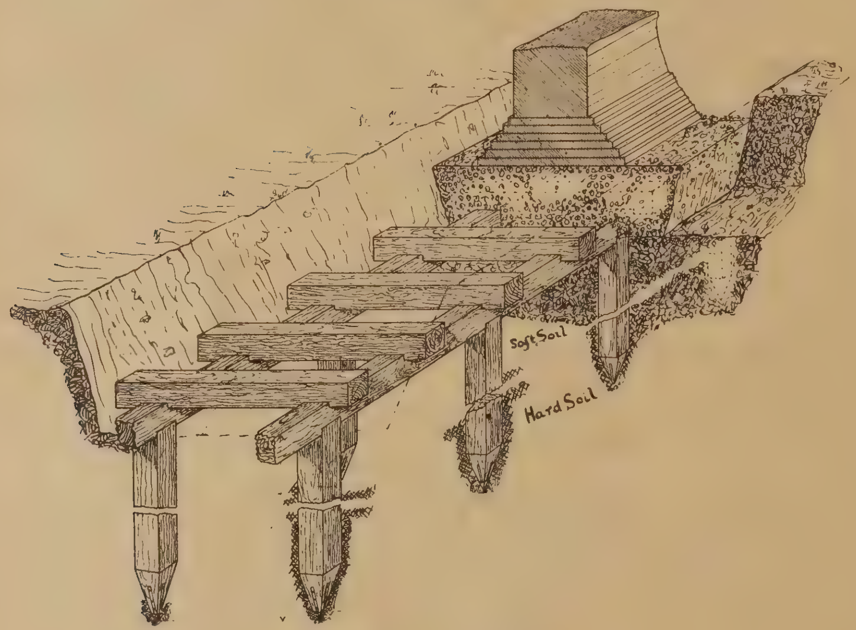
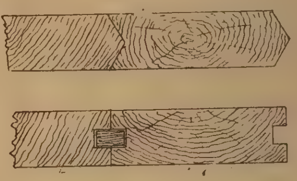


Fig. 2.—Bearing piles.

Fig. 1 is a sketch of one corner of a sheet-piled site in course of preparation. The work is generally carried out in the following manner: The position of the walls is set out on the ground, and trenches are made some 3ft deep; guide piles, about 10in. square, are then driven at the four corners, about 18in. outside the base line of walls; intermediate ones, about 18ft. apart, are then driven in line with the former; the heads of these guides are left level with the ground line, and connected by horizontal rows of timbers termed "wales," bolted in pairs on each side of the piles, one row at the heads and another at the bottom of the trench. These wales are notched out until the space between them nearly equals the thickness of the sheeting. Sheeting is composed of 9in. by 2in. or 11in. by 3in. planks, either square-jointed, or grooved and tongued, or bird's-mouthed, as shown in Figs. 3 and 4. The bottom ends of these sheet piles are cut to a sharp edge of V section, and with the edge inclined from 30deg. to 45deg., as shown in Figs. 5 and 6. This inclination is given to them so that they may drift together in driving and so tighten up the joints.

If the soil is gravelly, pieces of thin sheet iron should be bent round the foot and fixed with clout nails to protect the edge. The guide piles are trimmed to a pointed shape, and, when necessary, a cast-iron shoe is fixed to the point, as shown in Fig. 7. There are several patented shoes on the market, designed to prevent the shoe being knocked aside or disconnected in driving, but these are mostly used in harder soils than we are dealing with at the moment. The sheet piles are entered between the wales, the first one, of course, against a guide post, which is either grooved to receive the whole thickness of the sheet pile or with an inch groove to receive a tongue, as shown in Fig. 8, and they are driven down usually with a wooden maul, termed a "beetle," until they are level with the upper wales. These are then removed, and the driving is continued until the lower row is reached; then the guides are cut off level with the rest, and either the trench (or the whole site excavated to the same depth) is covered with a layer of concrete, up to the heads of the piles, and the superstructure is commenced therefrom.

In the second case mentioned (a soft, silty surface covering firm ground below) two alternative methods are employed, according to circumstances. In the one, piles of considerable length are driven through the soft strata until they enter the solid ground beneath, or if this distance should be too great for piles of the requisite length to be readily obtained—and the limit may be taken as 36ft.—short, stout piles are used, driven at close centres, and depending for their effect upon the friction of the soil upon their sides. The former are termed bearing piles, the latter friction piles, and the safe load is calculated on the former to be equal to 2½ cwt. per square inch of section, and on the latter to 1½ cwt. per square inch of section, which is equivalent to 12½ tons on a pile 10in. square in the first case, and to 16¾ tons on a pile of 15in. side in the second case.



Figs. 3 and 4.—Details of sheeting joints.

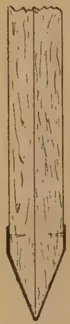


Fig. 5.—Shoes for sheeting piles.

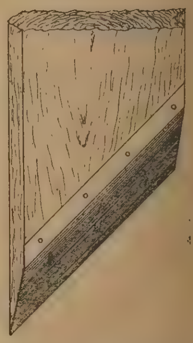


Fig. 6.—Side view of foot of Fig. 5.

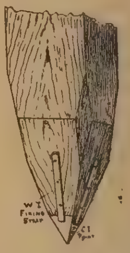


Fig. 7.—Shoe for guide pile.

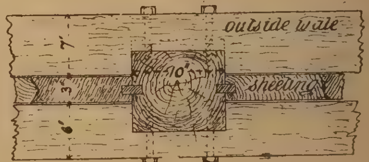


Fig. 8.—Method of fixing wales.

Fig. 2 illustrates the method of preparing the foundations in a soft top soil with firm soil beneath. Two rows of 12in. piles, 8ft. apart, are driven about 3ft. into the solid bottom, with 9in. by 9in. sleepers, notched and spiked to their heads; across these at right angles are notched balks of similar scantlings, about 2ft. 6in. apart, and the timbering is continued through the wall trenches. The ground is filled in to the underside of the sleepers, well rammed, and the entire trench filled in with concrete to a depth of 12in. above the timbers, and from this the footings commence. All the timbers should be creosoted before use to prevent decay.

(To be concluded.)

Electric Lighting at Heckmondwike.—The District Council has agreed to apply for sanction to borrow £14,000 for electric lighting purposes.

PREVENTION OF SMOKE.*

By THOS. G. DEE, A.S.I.

DRASTIC, indeed, were the measures taken to ensure the prevention of black smoke, caused by the combustion of coal in these realms, in the year of Our Lord 1306, when, by virtue of an enactment promulgated by His Most Gracious Majesty King Edward I., one John —— was tried, condemned, and executed for burning coal in the City of London.

With all the accumulated knowledge of to-day, with the elaborate methods for the analysis of combustibles, the learned theories of chemical combination of gases, evolved at, and maintaining high temperatures, we are possessed of no more certain method for preventing black smoke than that enforced 600 years ago.

The times, however, are "out of joint" with such a method of solving the problem we are considering to-day. In our examination of the effects of the legislation of the present day, and its enforcement upon the nation generally, with respect to black smoke, we shall, therefore, doubtless do well to give due prominence to all sides of the question, so that we may attain, as far as possible, the aim of all good politicians—*i.e.*, the greatest good for the greatest number.

Our consideration of this question cannot, therefore, be confined to the law and its literal enforcement, for, like so many of the other subjects we Sanitary Inspectors have to deal with, this likewise has an educational side. Therefore, unless we are acquainted with at least the rudiments of the science of combustion, how dare we claim to be fully equipped to carry out this branch of our crusade for the advancement of the public health?

I purpose, therefore, to very briefly discuss our subject under four heads:—

(*a*) The theory of combustion.
(*b*) The development and the decomposition of coal.
(*c*) The history of the special application of (*a*) and (*b*) to the modern furnace.
(*d*) The law thereon.

The true theory of combustion was first enunciated by a French chemist, named Lavoisier, in the eighteenth century. Working on matter gathered by himself and others, he demonstrated three principal facts:—(1) That whenever a substance burnt, if the whole of the products of that combustion were collected, those products were greater in weight than the material consumed. (2) That the amount of heat obtained by the combustion of a given weight of the combustible was always the same. (3) That the substance which had been added to the combustible was always oxygen, and that the atmosphere had lost oxygen.

As magnesium oxide is a non-volatile substance, I will now try to show you that by burning a piece of magnesium wire in the air of this room, the resultant substance or ash is of greater weight than the magnesium burnt, and further, that the physical properties of magnesium oxide are very different from those possessed by either the magnesium burnt or the atmosphere absorbed.

[*Experiment.*—Equal weights of magnesium wire were placed in each of the scale pans of a balance, one portion was burnt, becoming thereby much heavier, and the difference of the physical properties of colour, &c., were observed.]

Proofs of the other facts Lavoisier demonstrated are too elaborate for the short time at our disposal to-day. They are, however, as incontrovertible as the one I have demonstrated, and we know therefrom that oxygen, which as a colourless, odourless gas forms one-fifth by volume of our atmosphere, must have been absorbed therefrom, and be present in another form in all products of perfect combustion.

The substances most readily burnt are those containing both hydrogen and carbon. The first is a colourless, tasteless, odourless, very light gas; the other a solid, one form of which is known as charcoal. Either of these substances, separate or chemically combined, when brought into contact with free oxygen under suitable conditions and at definitely high temperatures, combine with that gas to form fully oxidised and well-known compounds. The combination with hydrogen, on cooling, is a liquid (water); the combination with carbon is carbon dioxide, a heavy but colourless gas. An intermediate compound of carbon and oxygen is a gas known as carbon monoxide. This gas will burn readily (*i.e.*, oxidise) into the previously mentioned carbon dioxide.

As typical of compounds of hydrogen and carbon (hydro-carbons) we will consider ordinary coal gas, and I will now try to show you that, for oxidation to take place, it is immaterial whether we burn coal gas in atmospheric air or atmospheric air in coal gas.

[In the experiment which followed, a jet of atmospheric air was burnt in a glass chamber full of coal gas.]

As typical of the change of state which takes place during the combustion of the solid compounds of hydrogen and carbon, we will now examine the combustion of a candle. Here the flame is hollow, and the solid hydrocarbon of which our candle is composed has been formed into a gas by the temperature of the burning wick, and of this gas that portion which is on the outer side is in immediate contact with the oxygen of the room and therefore burns, whilst the combustible gas is continually distilled into the hollow centre.

[In the experiment illustrating this the gas produced by the burning candle was drawn off from the centre of the hollow space within the flame through a tube, and burnt at a distance of several inches from the point of its production.]

No black smoke has been produced during the combustion of the gases we have used, but by interfering with the conditions of the oxygen supply we can obtain an imperfect combination. The most simple illustration of this is shown in the burning of an oil lamp, when, if the rate of production of the gas from the oil is in excess of the air supply, we say the lamp smokes, and turn down the wick to limit the amount of the gas generated, to the capacity of the air supply in the consuming chamber (*i.e.*, the chimney).

Again, the air supply for the oxidation of coal gas is different in an illuminating and in a Bunsen burner, and whilst we can interfere with the diffusion of the oxygen into the gas in the illuminating burner by placing a cold plate on it, and thereby get free carbon as a product of the imperfect combustion we have set up, we cannot thus interfere in the case of a Bunsen burner because of the perfect admixture of gas and air which exists in this latter case. [These results were proved by experiment.]

The following is a table which shows the relative weights of the substances usually produced by the combustion of the elements present in coal:—

12lb. of carbon unites with 16lb. of oxygen and forms 23lb. of carbon monoxide.
12lb. of carbon unites with 32lb. of oxygen and forms 44lb. of carbon dioxide.
1lb. of hydrogen unites with 8lb. of oxygen and forms 9lb. of water.
32lb. of sulphur unites with 32lb. of oxygen and forms 64lb. of sulphur dioxide.
1lb. of hydrogen unites with 16lb. of sulphur and forms 17lb. of sulphuretted hydrogen.

The only *black* substance (if any) set free during the combustion of the substances enumerated in the foregoing list is carbon, and that in a state of very fine division.

From the brief epitome of the theory of combustion which I have laid before you I trust you will permit me to assert that for perfect rapid combustion of hydrocarbons it is essential that they should be brought into intimate contact with free oxygen at a high temperature, and that the perfect oxidation of all the carbon present in the combustible prevents the possibility of the emission of *any* black smoke.

The next subject for a brief comment is coal. This, for the purposes of a readily combustible material, may be considered as, essentially, a compound of hydrogen and carbon. The source from whence the carbon present was obtained was that heavy colourless gas, carbon dioxide, to which I have previously referred. This gas, which is present in a very small proportion in normal air, is absorbed by living green vegetation in sunlight, oxygen is set free, whilst the carbon and the heat derived from the sun are built up into the growing plant together with water to form wood, or more correctly to form a carbohydrate called cellulose, a substance in which 72lb. of carbon, 10lb. of hydrogen and 80lb. of oxygen are the proportions in which those three substances are found.

This cellulose, which is 44 per cent. of carbon and 6 per cent. of hydrogen, having undergone chemical change in the coal measures, has been converted into various kinds of coal according to the variation in the elimination of its components (hydrogen, oxygen, and carbon) until in round numbers there is found:—

In such a new coal as Lignite, 75 per cent. of carbon to 5 per cent. of hydrogen.
In Bituminous coal, 85 per cent. of carbon to 5 per cent. of hydrogen.
In Steam coal, 88 per cent. of carbon to 5 per cent. of hydrogen.
In Anthracite coal, 92 per cent. of carbon to 4 per cent. of hydrogen.

That is to say that by the physical action of pressure and temperature chemical changes are set up resulting (often in a ratio to the time occupied) in larger percentages of carbon being left in the coal.

Experiment.—I will now attempt to show you that from the *colourless* solution present in this beaker, which is a carbohydrate as truly as cellulose is, it is possible to so alter its chemical nature that black carbon shall be set free, and this you see is done by the addition of another colourless liquid.

Please note that carbon dioxide, water vapour, and heat are given off to the atmosphere when coal burns, providing that atmosphere with substances which living green vegetation requires for its support and growth and to enable it to retain for future use the heat of the sun.

Necessarily, therefore, from some source this product of the oxidation of carbon is an essential part of the atmosphere if the cycle of life on the earth's surface is to be maintained.

It must, however, be remembered that this change from growing vegetation to coal took place under conditions in which other substances became incorporated with the coal, and for our purpose the most important admixture is that of sulphur, which in varying though small proportions is always present in coal. This sulphur may become oxidised and passed into the atmosphere as sulphur dioxide, a deleterious gas, or it may combine with hydrogen to form that very disagreeable, odorous and dangerous gas, sulphuretted hydrogen.

We now know that the object of furnace construction, as far as the prevention of black smoke is concerned, is to bring about such conditions therein as shall cause the conversion of the whole of the carbon present in the coal into carbon dioxide, and that has to be done by bringing oxygen into close contact with the coal at high temperatures.

The requisite conditions are, therefore: means of control of the rate of the flow of air through the furnace, *i.e.*, air inlets and air outlets, with means of shutting off both partially or entirely; a chamber sufficiently large, both superficially and cubically, to allow coal and air to diffuse into each other, *i.e.*, a fairly large firebox with a sufficient grate area. Given these, and a suitable coal, by properly using his damper, his furnace door, maintaining a uniform temperature in the furnace, even stoking from front or sides and good clinkering, an able stoker can obtain a proper result in water evaporation without the formation of black smoke.

Unfortunately, however, it is very usual to require a boiler to produce more steam than it does readily, *i.e.*, to obtain a larger result from

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[*] A paper read before the Annual Provincial Conference of the Sanitary Inspectors Association at Lincoln on August 4th.

the capital value of the plant laid down than should be expected. Also, it is often attempted to decrease the daily coal bill by using a cheap kind of coal, and such improper attempts are often the cause of the emission of black smoke, which fortunately a due enforcement of the law will soon make very costly methods of economising.

(To be concluded.)

Builders' Notes.

A Slater's Affairs.—Last Wednesday, in Ayr Sheriff Court, before Sheriff Orr Paterson, John Sime, slater and plumber, of York Street Lane, Ayr, appeared in a petition for cessio. In examination he stated that he had been twenty-eight years in business altogether, the last four years being in Ayr. He attributed his present deficiencies to the rise in the price of materials after he had undertaken different jobs. The value of his stock he estimated at £50. He had been forced to take out cessio owing to being pressed by his creditors. Mr. David Crawford, accountant, of Ayr, was appointed trustee on the estate.

Leeds Building Employers' Picnic.—The annual picnic of the Leeds Master Builders' Association on Wednesday was a very enjoyable function for those concerned. After lunching at the Builders' Exchange Club, the members drove to Harewood *viâ* Collingham and the Avenue. As usual, the annual meeting of the Association was incorporated with the outing. A visit was paid to Harewood Park. After rambling about the park for a few hours the party returned to Leeds, and in the evening the annual dinner was held at the Queen's Hotel, with Mr. Dews, the president-elect, in the chair.

Case Under the Employers' Liability Act.—At Chelmsford County Court, on Monday last week, an action under the Employers' Liability Act was brought by Mrs. Susannah Little, widow of Charles Little, against Messrs. Brown and Son, Limited, timber merchants, of Springfield, to recover £300 as compensation for the death of her husband. The deceased, who was a carman, was engaged with other men in moving a large piece of timber when the timber slipped, and scraped the flesh off the back of his hand. He was removed to a hospital in London, where he died from lockjaw. The facts were not disputed, and the only point raised was whether the yard in which the accident occurred was "about a factory."—His Honour held that it was, and it was thereupon agreed that the plaintiff should be awarded £100 and costs.

The Hull Building Dispute.—Alleged Contempt of Court.—On Wednesday, Mr. Justice Cozens-Hardy, sitting as Vacation Judge in the Chancery Division of the High Court, had before him a motion for attachment in the case of Walters *v.* Green for contempt of court on the part of the defendants in disobeying an injunction granted by Mr. Justice Stirling just before the close of the Trinity sittings. Counsel for the defendants asked that the motion might stand over for a week in order to afford an opportunity for answering the affidavits, copies of which had only been delivered on the previous Monday. The motion was to commit the defendants for a breach of an injunction restraining them from watching and besetting certain workmen at Hull. Mr. Mulligan, Q.C., who appeared to support the motion, admitted that the request was reasonable, but suggested that some limit should be fixed for putting in the defendants' answers to the affidavits. Defendants' counsel undertook that copies of the affidavits should be delivered not later than Friday, and upon that undertaking the motion was ordered to stand over till to-day.

Masters and Men.

Kilmarnock Joiners' Strike.—At a meeting of the master joiners last Wednesday night it was decided to grant an advance of ½d. per hour which has been demanded by the men. The wages are now 9d. per hour.

The Amalgamated Operative Slaters' Society of Scotland opened a new branch at Alexandria on Saturday week, when a large number of the slaters employed in the Vale of Leven became members. A deputation from the central board at Glasgow was present, and explained the objects and benefits of the association.

Engineers' Wages in Mid-Lancashire.—Lord James of Hereford has consented, on the invitation of Mr. T. Biggart and Mr. G. N. Barnes, to act as umpire and to decide the question as to the state of trade in mid-Lancashire between April 1st and the end of June last. The inquiry will be entered upon as early as possible next month, but whether in London or Manchester is left to the option of Lord James.

Dundee Master Plasterers have withdrawn the advance of ¼d. per hour which they offered on 20th July last to the labourers now on strike, and which the latter refused to accept, persisting in their demand for an advance from 5½d. to 6d. per hour. The masters declare that they will pay the standard rate of wages for the district—viz, 5½d. per hour, and that all their shops are open to employ free labour.

Compensation Case Settled at Stourbridge.—At the Stourbridge County Court on Wednesday, before Sir R. Harrington, Bart., a case was entered under the Workmen's Compensation Act, in which Thomas Mills, clay miner, was the plaintiff, and Messrs. Mobberley and Perry, fire-clay manufacturers, were the defendants. It was a claim for injuries to Mills' spine. Mr. Hinds said he represented the applicant, and the respondents had sent him an agreement to an award upon the basis of a weekly wage of 21s. 6d., and he asked for an award of 10s. 9d. per week. There was no period mentioned, and his Honour asked whether the award would be for life, to which question Mr. Hinds answered in the affirmative. Costs were granted on the £50 scale up to the date of the defendants' letter agreeing to an award.

The Danish Labour War.—It is reported that the threat of the Employers' Federation to extend the lock-out to trades hitherto unaffected has been carried out. All the tailors, blacksmiths, locksmiths, wainwrights, cement workers and stonemasons in Denmark are thus put out of work. The lock-out of the tailors also includes the women engaged in the making of mens' clothes, some 2,000 in number. Altogether some 12,000 more workers have been turned on to the streets, making a total of 52,000 in all. The exclusion of the women, many of whom have hitherto supported husbands who were already locked out, has created much adverse comment. The strike, which now embraces nearly two-thirds of the whole industrial population of the country, has lasted ever since May. The employers seem determined to starve out the whole body of Danish workers rather than declare themselves beaten. The finances of the Trade Union Federation are getting low, and only help from outside can enable them to hold out successfully. The employers declare that the following points must be agreed to by the men before the lock-out is withdrawn: (1) There must be national agreements in future, and not local. (2) The employers are to reserve to themselves the absolute right as to deciding the method and division of work in the factories and workshops without interference from the unions. (3) The foremen must not be members of the unions. (4) All agreements as to terms to terminate on January 1st of each year.

Leeds Bricklayers' Dispute.—A meeting of the Leeds Master Builders' Association was held on Tuesday, last week, at the Exchange Club, to consider the ballot that had been taken on the proposed settlement with the London Order of Bricklayers, which includes an advance of ½d. per hour. In the absence of Mr. W. Nicholson, the president, the chair was taken by Mr. W. H. Dews, the vice-president. It was reported that ninety-two papers had been sent out, and that fifty-one had been returned. Of these, forty-eight were opposed to the advance, and the remaining three were in favour of it. Two of the three, however, were signed by members who do not employ bricklayers. After some discussion it was decided to adjourn the meeting for a week with a view to seeing whether any further replies would be sent in.

Contractor Sued for Compensation.—In Edinburgh Sheriff Court recently, before Acting Sheriff-Substitute Sym, parties appeared in an action under the Workmen's Compensation Act at the instance of Donald M'Kinnon, labourer, of 16, Murdoch Terrace, Edinburgh, against John Best, contractor and quarrymaster, residing at Warriston House, Inverleith Row, for 11s. 8d. weekly as long as the plaintiff is unfit to follow his usual employment.—Mr. William Spink, for the plaintiff, explained that his client was engaged at Craigleith Quarry, of which the defendant was lessee. On the morning of May 6th last the plaintiff was walking down a road inside the quarry when the ground gave way under his feet and he was precipitated a distance of about 14ft. His left arm was fractured, and he received such other injuries that he had not been and would not be able to work for some time.—For the defendant, who was represented by Messrs. Macpherson and Mackay, it was pointed out that the man's wages had been at the rate of 18s. 7d. per week, so that he was only entitled to sue for 9s. 3½d. under the Act. An offer to pay the smaller sum was accepted by the plaintiff.

Engineering Notes.

The Police Station, Egremont, is being fitted by John King, Limited, engineers, Liverpool, with their latest improved economical hot water heating apparatus.

Electric Lighting at Brighton.—The Local Government Board has given its sanction to the loan of £64,000, for twenty-four years, for purposes of electric lighting.

The Small Pox Hospital, Whitmore Common, Worplesdon, is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues and patent exhaust roof ventilators.

Eastbourne Electric Lighting Works are to be taken over by the Corporation at the beginning of next year, and a resident engineer is to be appointed at a salary of £300 a year. He will be required to devote the whole of his time to the duties of his office. Applications are to be sent in by September 1st.

Electrical Engineering in Sweden.—The Swedish State railway authorities have placed a contract with Messrs. Siemens and Halske for the establishment and equipment of electrical power stations at Abiskojokk and Kadeyokk, near the new railway between Gellivaia and the Norwegian frontier.

New Electric Lighting Works at Poplar.—The foundation stone of new electric lighting works, which are estimated to cost £10,000, was laid at Poplar recently. A scheme has been prepared by which over twenty miles of streets will be lighted by electricity, and the works are to be built by direct labour from the plans prepared by the surveyor to the board.

Surveying and Sanitary Notes.

Water and Sewage Work in Perthshire.—The Water and Sewerage Committee of the district of Killin, Perthshire, have agreed to the extension of both systems, which is to be carried out from the reports, and under the superintendence of their engineer, Mr. Woulfe Brenan, M.I.C.E., Oban, N.B.

Improvements at Accrington. — The Accrington Corporation has decided to open out a new highway leading from Whalley Road to Burnley Road. This will involve the building of a bridge over the Lancashire and Yorkshire Railway. The cost, including improvements to Blackburn Road, will probably be about £50,000.

Altrincham Sewerage.—Mr. Herbert H. Law, Local Government Board Inspector, held an inquiry at Altrincham on Thursday, into an application of the Urban District Council for sanction to borrow the sum of £22,000 for the construction of a new outfall sewer, and the purchase of land adjoining the Council's present sewage farm at Woodcote, near Altrincham.

Lady Sanitary Inspector. — Miss Lizzie Marguerite O'Kell, of Bedford, who was educated at Queen's College, Harley Street, London, and holds the certificate of the Sanitary Institute, has been appointed sanitary inspector for Marylebone, her duties being chiefly the examination of the industrial establishments in the parish where women are employed.

A Bradford Deputation to France.—A meeting of the Bradford Sewage Defœcation Committee was held at the Town Hall on Thursday, Alderman R. Pratt presiding. It was resolved that a sub-committee, consisting of Alderman R. Pratt Messrs. R. Johnson, W. C. Dixon, and F. L. Croft, should be appointed to visit and report upon sewage purification by the Patent Benzine process, now in operation at Roubaix, France.

Ulverston Improvements.—Col. Slacke, R.E., an inspector of the Local Government Board, held a public enquiry last week respecting an application of the Council to borrow £1,900 for the purchase of land for the widening and improvement of Princess Street, at the junction of Bryer's Smithy; £2,750 for the purchase of the old Liverpool Bank premises, and adjoining property, in Queen Street, with the view of converting the same into new Council offices; and £1,050 for the purchase of penny-in-the-slot meters and gas cookers, and the extension of the gas main to Low Mill Tannery. There was no opposition, and the proceedings were of a formal character.

Bishop Auckland Water Scheme.—Owing to exacting demands made upon them from time to time by the Durham County Council, the Bishop Auckland Urban Council, at a cost of over £2,000, laid down a new filter bed on the Council's West Mill estate, and this was publicly opened recently. The Local Government Board have refused to sanction the borrowing of the money, and the cost will have to be defrayed out of the rates. It is intended to lay down a similar filter bed near the present new one.

Street Improvement at Blackpool.—Last Wednesday, at Blackpool, Colonel W. R. Slacke, R.E., a Local Government Board Inspector, held an inquiry into the application of the Corporation for sanction to borrow £9,156 for works of private street improvement. There was no opposition. The money is to be devoted to making new streets, which are already sewered and built upon. Mr. T. Loftos, the town clerk, and Mr. Wolstenholme placed the facts before the inspector, who was told that the amount of outstanding loans under the Sanitary and Public Health Acts was £396,266.

Street Widening Arbitration Case at Leeds.—The umpire (Mr. R. Horsfall, of Halifax) in the arbitration proceedings between the Leeds Corporation and Mr. John Myers for the purpose of assessing the amount to be paid in respect of an area of frontage land situated between the Smithfield Hotel and St. Thomas Street, which is required for the widening of North Street, has made his award. He fixes the amount at £1,859. At the enquiry, some time ago, the sum claimed by Mr. Myers was £2,838, while the witnesses for the Corporation estimated the value at between £1,152 and £1,230.

Huntley Sewage Scheme. — A special meeting of the Police Commissioners was held recently, for the purpose of considering the offers for the new sewerage. A letter from Mr. Barron, C.E., recommended the acceptance of the tender of Mr. J. M'Connachie which was £424 8s. 1½. £40 7s. 5d. would have to be deducted for a drain which is not yet to be proceeded with, leaving the full offer at £384 0s. 8½d. Mr. M'Connachie's offer was ultimately accepted, and a small committee, consisting of Provost Pirie, Baillie Sellar, and Mr. James Lemon, street convener, were appointed to consult with Mr. Barron as to the order in which the work was to proceed.

Private Street Improvement Case.—At the Skipton Petty Sessions on the 19th inst., a case of some interest to public bodies and property-owners occupied the attention of the magistrates for several hours. The Skipton Urban District Council some time ago, in connection with private street improvements, passed a resolution to make Belgrave Street, Gargrave Road, and the cost was apportioned to the several property-owners in that street. Twelve of these property-owners objected to the apportionment, and the Urban District Council, in accordance with the Act of Parliament, decided to lay the case before the local magistrates. Mr. R. Wilson, as clerk to the Council, conducted the case on behalf of that body, and Mr. Proctor, of Burnley, appeared for the objectors. After the town surveyor (Mr. J. Mallinson), and other expert witnesses had been called, the magistrates decided in favour of the Urban Council, and allowed them £3 10s. cost.

Sewage Disposal in India.—An experiment has just been brought to a successful conclusion in the Presidency Gaol, Calcutta, which is likely to have an important bearing upon the future sanitation of India. It has been to try the efficacy of the new aseptic pit system for the disposal of sewage. The aseptic pit, which has been very favourably reported upon at home, is uncommonly like the old unwholesome cesspit. It is managed, however, on scientific principles, and therein lies all the difference. The cesspit in the new system is a dark, underground chamber with well-luted sides, in which is cultivated the aseptic germ, a microscopic organism which has only to be introduced and supplied with a properly regulated flow of sewage to convert the evil-smelling products of the drains into harmless fluid. The sewage is allowed to remain in the pit just long enough to allow the necessary chemical changes to take place. This done, the product passes out through a rough filter of well aerated slag, where it becomes thoroughly deodorised, eventually leaving the apparatus in the form of a limpid and harmless product.

Health Exhibition at Lincoln.—In connection with this exhibition, a report of which appeared in our issue of August 16th, the Council of the Association decided to award silver and bronze medals for the two best exhibits of manufactures suitable for work in connection with the sanitary inspectors duties, also five certificates of merit in addition. The judges appointed were Messrs. T. J. Moss-Flower, C.E., F.G.S., Chairman of Council; T. G. Dee and W. H. Grigg, vice-Chairmen of Council; S. C. G. Fairchild; and the Hon. Sec., E. Tidman, C.E., F.S.I. The judges made a careful inspection of the exhibits on Monday, August 8th, and have made the following awards:—*Silver medal*—Messrs. Oates and Green, Halifax, Yorks., "For general excellence of the exhibits." *Bronze medal*—Messrs. Guest and Chrimes, Rotherham, Yorks., "For general excellence of the exhibits." *Certificates of merit*—Messrs. Wilson and Stockall, Bury, Lancs., "For their ambulance appliances;" Mr. C. Duckering, Lincoln, "For the general excellence of exhibits;" Messrs. Arnold and Co., Ltd., Lincoln, "For the general excellence of exhibits;" Mr. E. F. Arnold, R.P.C., Lincoln, "For exhibit of plumbing defects;" Messrs. Lockerbie and Wilkinson, Birmingham, "For the general excellence of exhibits."

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		BUILDINGS—		
Sept.	1	Malmö, Sweden—Electric Works	... .,	Clerk, Gasworks, Malmö.
,,	1	Irvine, Scotland—Academy	Burgh School Board	J. Armour, jun., Architect, Irvine.
,,	1	St. Albans—Alterations, &c., to Premises	Corporation	City Surveyor, St. Albans.
,,	1	Bristol—Office	Corporation	T. H. Yabbicom, 63, Queen's-square, Bristol.
,,	1	Rossall—Rifle Butt Buildings	....	T. E. Copping, 7A, Central Beach, Blackpool.
,,	2	Cowling, Yorks.—Stores	Beehive Co-operative Society	Ben Snowden, Secretary, Cowling.
,,	2	Windsor—Sanitary Convenience	Town Council	Borough Surveyor, Helena-road, Windsor.
,,	2	Leeds—House	Gas Committee	R. H. Townsley, General Manager, Meadow-lane Gasworks, Municipal-buildings, Leeds.
,,	2	Loughborough, Leicestershire—Houses	J. Bennett and T. A. Hubbard	A. L. King, Architect & Surveyor, Baxter-gate, Loughboro'.
,,	2	Selby—Pointing	Selby Urban District Council	B. McG. Gray, Waterworks Manager, Town Hall, Selby.
,,	2	Carmarthen—Reservoir	Corporation	Borough Surveyor, Town Hall, Carmarthen.
,,	4	Padiham—Technical Institute	Urban District Council	H. Ross, Architect, Cannon-street, Accrington.
,,	4	Hailsham, Sussex—Foundations for Asylum	East Sussex Visiting Committee	G. T. Hine, 35, Parliament-street, Westminster, S.W.
,,	4	Falkirk—Tenements	Falkirk Heritable Property Co., Ltd.	J. C. Allen, Secretary, Newmarket-street, Falkirk.
,,	4	Halifax—Staircases	....	W. C. Williams, Architect, 29, Southgate, Halifax.
,,	4	Sowerby Bridge—Warehouses	Calder Oilcloth Works	Jackson and Fox, Architect, 7, Rawson-street, Halifax.
,,	5	Portsmouth—Repairs to Graving Dock	Borough	Borough Engineer, Town Hall, Portsmouth.
,,	6	Sandgate, Kent—Church and Schools	....	Gordon, Lowther, and Gunton, Finsbury House, Blomfield-street, E.C.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Sept. 6	Cwmaman, Wales—Houses	Trustees of the Mount Pleasant Bldg. Club	J. L. Smith, Architect, Aberdare.
,, 6	Ealing—Extension of Coverings	Great Western Railway Co.	Engineer at Paddington Station, London,
,, 6	Mallow—Repairs	Mallow Rural District Council	M. Regan, Clerk, Workhouse, Mallow.
,, 6	Westbury, Wilts.—Station	Great Western Railway Co.	Engineer at Bristol Station.
,, 7	Ballycrovane, Co. Cork—Coastguard Station	....	Carpenter-in-charge, Queen's College, Cork.
,, 7	Devonport—Three Shops and 24 Dwellings	Council	J. F. Burns, 30, Ker-street, Devonport.
,, 7	Leeds—Wall	....	City Engineer's Office, Municipal-buildings, Leeds.
,, 7	Edinburgh—Public School	School Board	R. Wilson, Architect, 3, Queen-street, Edinburgh.
,, 8	Darwen, Lancs.—Post Office	....	J. B. Thomley, Architect, Darwen.
,, 8	Cromarty, N. B.—Coastguard Buildings	Admiralty	Director of Works, 21, Northumberland-avenue, W.C.
,, 9	Lancashire—River Bridge	County Council	W. H. Radford, Engineer, County Offices, Preston.
,, 9	Rhyl—Intermediate School	....	F. H. Shayler, Architect, Welshpool.
,, 12	Croydon—Superstructure of Asylum	Town Council	Borough Engineer, Town Hall, Croydon.
,, 12	Poplar—Office and Lavatory Accommodation to Asylum	Asylum Authorities	J. and T. F. Clarkson, 136, High-street, Poplar.
,, 13	Dukinfield—Offices, &c.	Stalybridge and Dukinfield Joint Sewerage Board.	W. M. Smith, District Council Offices, Dukinfield.
,, 13	London, S.E.—Alteration	Bermondsey Vestry	Surveyor to the Vestry, Town Hall, Bermondsey.
,, 13	Stalybridge—Buildings	Sewerage Board	Newton, Son, and Bayley, 17, Cooper-street, Manchester.
,, 13	Birmingham—Distribution Works	Corporation	J. Mansergh, 5, Victoria-street, Westminster, S.W.
,, 15	Enfield—Block of Schools	School Board	G. E. T. Laurence, 181, Queen Victoria-street, E.C.
,, 30	Hallwill, Devon—Cottage Hospital	....	C. F. A. Voysey, 6, Carlton Hill, N.W.
Oct. 3	Watford—Offices and Warehouse	Benskin's Brewery, Limited	C. P. Ayres, 14A, High-street, Watford.
No date.	Newport, Mon.—Schools	....	F. R. Kempson, Architect, 16, High-street, Cardiff.
,,	Nottingham—Workhouse Additions	....	A. H. Goodall, Architect, 14, Market-street, Nottingham.
,,	Leicester—Chapel and Schools	....	A. E. Sawday, Architect, 4, Market-street, Leicester.
,,	Leeds—Alterations to Infirmary	....	W. A. Hobson, Architect, 82, Albion-street, Leeds.
,,	Portsmouth—Wesleyan Church Hall	....	J. J. Green, Architect, South John-street, Liverpool.
	ENGINEERING—		
Sept. 1	London, E.C.—Compressed Air Receivers	Corporation of Trinity House	Secretary, Trinity House, E.C.
,, 2	Carmarthen—Reservoir	Corporation	Borough Surveyor, Carmarthen.
,, 4	Belfast—Widening Dock	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Harbour Office, Belfast.
,, 5	London, S.W.—Locomotives	Secretary of State for India in Council	Director-General of Stores, India Office, Whitehall, S.W.
,, 6	Waterloo, Lancs.—Tramways	Urban District Council	F. S. Yates, Surveyor, Town Hall, Waterloo.
,, 6	London, E.—Engineering Works	Poplar Union	F. J. Warden-Stevens, 34, Victoria-st., Westminster, S.W.
,, 9	East Ham—Electric Lighting, &c.	Urban District Council	W. C. Ullmann, The Limes, White Post-lane, East Ham.
,, 9	Keighley—Filtration Tanks	Rural District Council	Barker, Hopkinson, and Co., Craven Bank-chbrs., Keighley.
,, 11	St. Anne's-on-Sea, Lancs.—Electric Lighting Plant	Urban District Council	P. J. S. Tiddeman, Carlton-chambers, St. Andrew's-road South, St. Anne's-on-Sea.
,, 11	Carlisle—Extension of Steam Pipes, &c.	Corporation	Town Clerk, Carlisle.
,, 11	Fairlie, Ayrshire—Waterworks	County Council	P. C. Hart, 32, John Finnie-street, Kilmarnock.
,, 11	Preston—Bridge	Lancashire County Council	W. H. Radford, County Bridgemaster, County Offices, Preston
,, 12	Southport—Tramways	Corporation	J. D. Williams, Town Clerk, Town Hall, Southport.
,, 12	London, N.E.—Dynamos	Hackney Vestry	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 12	Bournemouth—Boiler	Town Council	F. W. Lacey, Borough Engineer, Bournemouth.
,, 13	Ilford—Railways	Great Eastern Railway Co.	Engineer, Liverpool-street Station, E.C.
,, 14	Birmingham—Water Distribution Works	Corporation	J. Mansergh, 5, Victoria-street, Westminster, S.W.
,, 14	Leyton—Pumps, &c.	Urban District Council	Engineer, Electricity Works, Cathall-road, Leytonstone.
,, 14	Grays, Essex—Refuse Destructor	Thurrock Urban District Council	A. C. James, Surveyor, District Council Offices, Greys, Essex.
,, 14	Southborough, Kent—Sinking Well	Urban District School Board	G. and F. W. Hodson, Engineers, Southborough.
,, 18	Maldon, Essex—Waterworks	Rural District Council	H. G. Keywood, Engineer, 6, Market Hill, Maldon.
,, 20	Heckmondwike—Electric Light Plant	Urban District Council	W. C. C. Hawtayne, 9, Queen-street-place, London, E.C.
,, 25	Ilfracombe—Plant	Urban District Council	W. H. Frentham, 39. Victoria-street, Westminster, S.W.
Oct. 14	Tiflis—Tramways Concession	Town Council	Managing Department of Council, Tiflis, Transcaucasus.
Nov. 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
	IRON AND STEEL—		
Sept. 2	Selby—Pipes	Urban District Council	B. McG. Gray, Town Hall, Selby.
,, 6	London, W.—Girders	Great Western Railway Co.	Engineer at Paddington Station, London.
,, 6	Norwich—Fencing	....	A. E. Collins, City Engineer, Guildhall, Norwich.
,, 9	East Ham—Rails	Urban District Council	W. C. Ullman, The Limes, White Post-lane, East Ham.
,, 9	East Ham—Steel Girder Tramway Rails	Urban District Council	W. C. Ullman, Engineer, The Limes, White Post-la., East Ham.
	PAINTING AND PLUMBING—		
Sept. 2	Stacksteads, Lancs.—Painting Chapel	Primitive Methodists	Rev. W. Tomley, Orchard Villa, Bacup.
,, 4	Darenth, Kent—Painting, &c., Asylums	Metropolitan Asylums Board	Office of the Board.
,, 6	Featherstone, Yorks.—Painting Hospital	Urban District Council	A. Freeman, Council Offices.
	ROADS—		
Sept. 2	Wolverhampton—Forming, &c., Roads	Public Works Committee	J. W. Bradley, Boro' Surveyor, Town Hall, Wolverhampton.
,, 4	Wellingborough—Granite and Slag	Urban District Council	J. T. Parker, 29, Church-street, Wellingborough.
,, 4	Belfast—Setts	Harbour Commissioners	G. F. L. Giles, Engineer, Harbour Office, Belfast.
,, 4	Clayton-le-Moors, Lancs.—Paving	Urban District Council	A. Dodgeon, Surveyor, Clayton-le-Moors.
,, 5	Wellingborough—Carting	Urban District Council	Clerk to the Council, Council Offices, Wellingborough.
,, 5	London, N.—Making-up, &c.	Stoke Newington Vestry	R. Brown, Engineer, Vestry Offices, Stoke Newington.
,, 6	Ashton-in-Makerfield—Materials	Urban District Council	J. W. Liversedge, Surveyor, Ashton-in-Makerfield.
,, 6	Sutton, Surrey—Road Works	Urban District Council	C. C. Smith, Surveyor, Council Offices, Public Hall, Sutton.
,, 7	Reading—Levelling, &c.	Sanitary Authority	J. Bowen, Borough Engineer, Town Hall, Reading.
,, 11	Bournemouth—Road	....	F. W. Lacey, Borough Engineer, Bournemouth.
,, 13	Croydon—Materials	Rural District Council	S. Stallard, Highway Surveyor, Town Hall, Croydon.
,, 18	York—Street Works	Corporation	A. Creer, City Engineer, Guildhall, York.
No date	Southend-on-Sea—Kentish Rag Stone Pitching	....	A. Penney and Co., 107, Fenchurch-street, E.C.
	SANITARY—		
Sept. 4	Lyme Regis, Dorset—Sewers	Town Council	Town Clerk, Town Hall, Lyme Regis.
,, 4	Sonnig, Berks.—Sewering, &c.	Workingham Rural District Council	R. W. Hamilton, 56, Hamilton-road, Reading.
,, 4	Bakewell—Drain	Guardians	E. M. Longsden, Town Hall, Bakewell.
,, 4	Glasgow—Sewer	Corporation	City Engineer, City Chambers, 64, Cochrane-street, Glasgow.
,, 4	Leavesden—Sanitary Work	Metropolitan Asylums Board	Office of the Board, Norfolk-street, Strand, W.C.
,, 2	Windsor—Conveniences	Town Council	Borough Surveyor, Helena-road, Windsor.
,,	Sutton, Surrey—Sewerage Works, &c.	Urban District Council	C. C. Smith, Surveyor, Council Offices, Sutton, Surrey.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Sept. 1	Otley—Isolation Hospital	£30, £15	C. V. Newstead, Clerk, Wharfedale Union Joint Hospital Committee, Union Offices, Boroughgate, Otley.
,, 4	Northfleet—Schools	£15 15s.	Clerk to School Board, 49, Windmill-street, Gravesend.
,, 15	Workington—Town Hall	£40, £20, £10	W. L. Eaglesfield, Surveyor, Town Hall, Workington.
,, 15	Dumfries—Public Library	....	J. Grierson, Town Clerk, Dumfries.
,, 16	Norwich—Bank	£52 10s., £21, £10 10s.	Secretary, Norfolk and Norwich Savings Bank, C.E.Y.M.S. Rooms, Norwich.
,, 28	Hay, Brecknock—Sewerage and Water Supply	£25	C. Griffiths, Clerk to Rural District Council, Hay.
,, 30	Tunbridge Wells—Designs in Tunbridge Ware	£3 3s., £2 2s., £1 1s.	Technical Education Committee.
Nov. 30	Island of New Providence, Bahamas, West Indies—Public Market	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *viâ* New York.
No date.	Broughton Moor, Cumberland—Institute and Twenty Cottages	....	Flimby and Broughton Moor Colliery Co., Maryport.

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SALE DAYS for the Year 1899.

Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, Sept. 21
Thursday, Oct. 12
Thursday, Oct. 26
Thursday, Nov. 16
Thursday, Nov. 23
Thursday, Dec. 7
Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

Seaside and other Land Sales.

MR. F. G. WHEATLEY is instructed to offer for SALE by AUCTION plots of exceedingly ripe FREEHOLD BUILDING LAND (tithe free and land tax redeemed), on the following ESTATES

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SEPTEMBER 13TH, 1899.

WIMBLEDON.—Raynes Park Estate.—Within 10 minutes of Raynes Park Station, with its excellent train service, 20 minutes from Waterloo. 77 plots of ripe Freehold Building Land, suitable for villas and small houses. Good road. Water laid on. Golf links adjoin estate.

SEPTEMBER 28TH, 1899.

CHURCH STRETTON, Shropshire, known as the Highlands of England, 13 miles from Shrewsbury, famous for its bracing air and medicinal properties of its mineral waters. Excellent golf links. Good hunting and shooting. About 80 plots, commanding fine views of the Stretton Hills. Return tickets for London buyers, including bed and meals, on 27th and 28th, price 10s., but early application is necessary.

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Particulars, plans, and railway tickets may be obtained on application to the Auctioneer, Mr. F. G. WHEATLEY, 263, Strand (next the Law Courts), W.C.

ANSELL and MALLOWS, Architectural Draughtsmen and Quantity Surveyors, 21, Buckingham-street, Strand, W.C.

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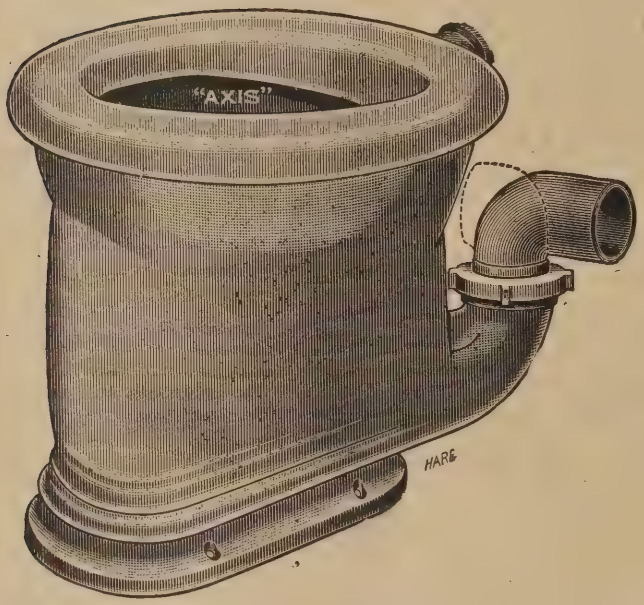

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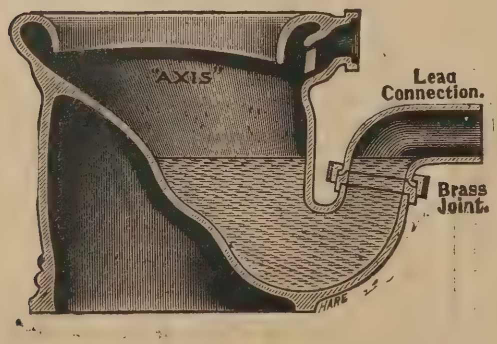

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS

September 6, 1899.
No. CCXXXIX.

Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

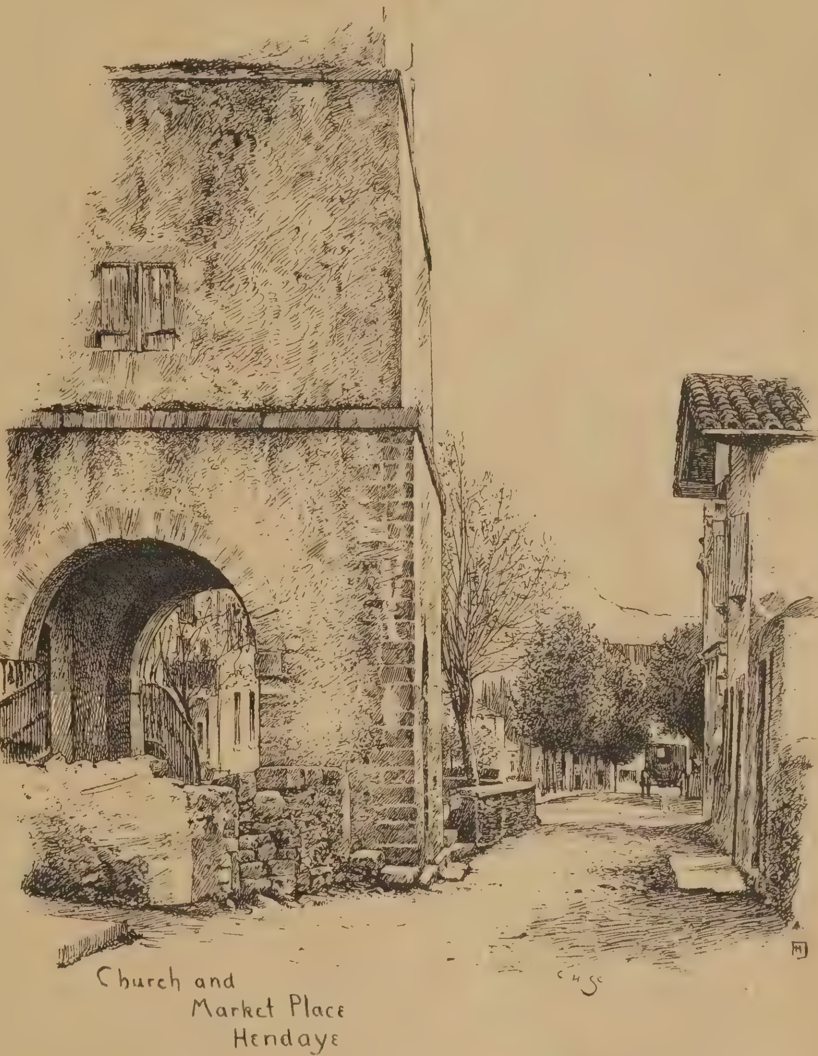
Colour Harmonies and the Course of the Seasons.

There is little doubt that one's usual surroundings exercise a great influence upon the taste, whether by way of contrast as begetting the desire for something different, or by way of similarity, the mind conceiving with difficulty great variation, or being unwilling to leave the familiar to try unknown combinations. Oriental nations, with the brilliant sunlight and sharp-cut shadows ever with them, delight in strong contrasts and combinations of colour, and the same effect is produced in others not so blessed by the constant companionship of the sea. One may instance the Venetians, the Earlier Norsemen, and our own nation. Perhaps in the second case the long winters with their carpet of white covering the ground may have helped by raising the desire for colour contrast, while utility may also have had its share in the necessity for distinguishing friend from foe and recognizing from afar the house of friendship.

One is accustomed to think that the modern perception of colour harmonies is more subtle and refined than that of days gone by, the epithets of Greek poets, for instance, showing small sense of accurate colour observation; and it is permissible to doubt whether the splendours of mediæval decoration would be satisfying to the modern eye if seen as they were when new, though the appearance of the few unrestored pieces to be still found here and there is so pleasing, Time having laid his harmonising hand upon them and dulled the too sharp contrasts.

Of the changes in one's surroundings which may affect one's perception of the beautiful, suggesting to the mind decorative forms and colours, those produced by the sequence of the seasons are at the same time the most prominent and universal. Winter comes with snow or rain, in either case suggesting strong oppositions and warm colour by way of contrast. The breath of spring goes forth over the land, which smiles responsive with blossoming orchards of pink and white, with bursting buds which flush the woods with a hundred delicate tints of purple, orange, yellow, and green, while sun and shower chase each other across the landscape with constant succession of blue shadow and golden light, and the distant hills put on their most beautiful colour. Summer follows, with its richness of roses and lilies and a thousand other lovely flowers, relieved against a background of dark full green, sometimes almost black, so deep is it, and the water lilies gleam in shady pool or among the reeds and bulrushes of the backwater; and then comes autumn, ruddy with orchard fruit and blazing in splendour of fading leaves, like the flames of a funeral pyre, which rise and sink and rise again in the wind till the final blasts scatter the last dying embers and leave the country stark and naked, waiting again for its snowy pall. Now the colour harmonies which satisfy in winter are not the same for which one longs in summer. In winter arrangements in which warm tones predominate are most acceptable, while in summer suggestions of coolness and memories of shady dells, where the blue sky peeps through the interlacing branches prove more charming—in fact, one may go farther than this; for on a summer's morning when the sun shines into a room, the walls of which are coloured a cool green or even a slaty grey, it is quite possible to feel happy and contented with one's surroundings, but let heavy clouds cover the sky and thunder peal and lightning flash, and one involuntary shrugs one's shoulders and glances around with discomfort, feeling the room chilly and cheerless—for in a minor degree the same remarks apply to sunny and shady rooms; the desire for warmth or coolness producing an appreciation of certain harmonies in preference to others which æsthetically may be just as admirable. And this suggests that in the selection of a scheme of colour for any decoration regard should be paid to the aspect and lighting of the room more than to the beauty and harmony of the arrangement viewed in the abstract. It is not enough to have a combination which shall be harmonious in itself—it must also be in harmony with the position of the room and the requirements which it is to fulfil.

A. W.



·DRAWN BY F. HAMILTON JACKSON, R.B.A. (*See p.* 67.)

Flint Castle. The performance of Shakespeare's Richard II., given by Mr. F. R. Benson in the grounds of Flint Castle in celebration of the quincentenary of that monarch's deposition by his cousin, Bolingbroke, has aroused some passing interest in that old ruin which impends so grimly over the estuary of the river Dee.

The Dee is an impressive river. When the tide is in, this magnificent waterway presents a grand aspect, marred only by the hideous railway bridge, of quite recent construction, which straddles across to Wirral, and by the coal mines and chemical works of Buckley and Flint, whose chimneys send a distant smirch of smoke across the sky. The scanty ruins of the once important Edwardian castle stand upon the shore, washed by every tide, and melting gradually away; but the massive angle towers and the sturdy curtain walls still give point to Shakespeare's excellently descriptive lines:—

> Go to the rude ribs of that ancient castle
> Through brazen trumpet send the breath of parle
> Into his ruin'd ears, and thus deliver:
> Harry Bolingbroke
> On both his knees doth kiss King Richard's hand.

Bolingbroke had returned to England after his banishment by the King, and, with a large following at his back, demanded the restoration of his estates and a revocation of the decree of banishment pronounced against him. To meet this imperious outlaw the King, who had been in Ireland, returned in haste. Delays, however, hindered the concentration of his forces; and finally those who had at first flocked to his banner dispersed, disheartened by the sinister reports that began to circulate.

Fearful of his safety, Richard assumed the grey habit of a Franciscan monk and crept off towards Conway. There, of all his followers, he found but the beggarly remnant of one hundred. To him, in this extremity, Bolingbroke sent, with fair promises, a cavalcade headed by the Earl of Northumberland, with an invitation to meet him at Chester. Richard, unsuspecting, agreed to accompany them as far as Flint. On their journey they came to a steeply descending road near the sea, and, dismounting, the King was proceeding down the road on foot, when he caught sight of men-at-arms lurking in ambush. "I am betrayed!" he exclaimed, in an agony of despair. "God of Paradise assist me! Earl of Northumberland," he continued, "If I thought you capable of betraying me, it is not too late to return." "You cannot return," replied the Duke, and so the King was lost.

The King's party reached Flint under close guard that evening, and, after he had dined, his captor made his appearance, bowing low, with mock humility. "My lord," he said, "I am come sooner than you sent for me; the reason wherefore I will tell you. The common report of your people is such that you have, for the space of twenty, or two and twenty years governed them very badly and very rigorously, and in so much that they are not well contented therewith. But if it please my lord, I will help you govern them better than they have been governed in time past," to which the unhappy King replied, "Fair cousin, since it pleaseth you, it pleaseth us well."

FLINT CASTLE. DRAWN BY C. G. HARPER.

Of course, this polite parley was but a solemn farce. The King was taken, in durance, to Chester, and finally thrust into Pontefract Castle, in whose dungeons he perished miserably at the hands of secret assassins.

Thus do the "rude ribs" of this ancient Castle of Flint wear an additionally impressive appearance to all those who have read the story of that ill-fated King. Nor do the ruins, apart from their associations, ever wear a cheerful aspect—black-browed and solemn as they are, brooding over the fateful, treacherous sands of Dee. C. G. H.

Back Numbers of the Builders' Journal Wanted.—The publisher would be much obliged if any readers who may have by them any copies of Nos. 105, 106, 107, and 108, dated February 10th, 17th, 24th, and March 3rd, 1897, of the BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, which they are able to spare, would kindly send them to him, as these are required for office purposes. A copy of the current number of the *Architectural Review* will be sent as an acknowledgment of the courtesy.

On Reflection.

Architecture and Health.

IN a recently-published Home Office blue book on the making of phosphorous matches there is a passage which is not without significance for architects. The passage in question occurs in a report by Dr. Talbot, the medical officer of health for Bow. Dr. Talbot has compared two factories as regards the prevalence amongst the workpeople employed of the terrible disease phosphorus necrosis, popularly known as "phossy jaw." He finds that in one of the two firms in question large sums are spent on medical and dental supervision, and yet the cases of the disease are far more numerous than in the other where these precautions do not seem to be taken; in fact, in the second factory the disease is almost unknown, only two mild cases having occurred in fifteen years amongst the 500 workpeople employed. From these facts, supplemented by a careful inspection of many other match factories, Dr. Taylor has been led to the conclusion that the comparative immunity of some factories as compared with others is due not so much to medical supervision as to the different methods of using the phosphorus consequent upon the different structure of the buildings. Where the arrangements allow of the dipping and mixing (the dangerous part of the work) being carried on in the open air, or, at any rate, in a building separate from the other departments, the danger is greatly lessened. These investigations point to the great need for architects when planning factories to give careful study to the processes of manufacture to be carried on in them. The architect who builds a factory has to be extremely practical and utilitarian, and perhaps even to do violence to his artistic sensibilities. But by way of compensation he may, if he will, have the satisfaction of knowing that by judicious planning and right methods of construction he has rendered "dangerous" trades almost innocuous, and increased the health and wellbeing of, perhaps, many generations of workers.

The Government and Architecture.

OUR leading architects—those great and gifted beings, we mean, who obtain Government commissions—will have a bad quarter of an hour when they read their "Fortnightly Review" this month. For Mr. Charles G. Harper has been surveying their works with his critical eye, and setting down their shortcomings with that trenchant pen of his, which nothing extenuates. We learn that Mr. Alfred Waterhouse, if he did fairly well with the Natural History Museum, achieved a melancholy failure with the City and Guilds Institute; Mr. Aston Webb has ranged the world over in quest of designs for his Victoria and Albert Museum, borrowing a tower from this building, a pavilion from another, and a range of windows from a third; the designs by Mr. Brydon and Mr. Young for the new Government buildings in Parliament Street and Whitehall are damned with faint praise, but as for recent examples of Post Office architecture Mr. Harper can scarcely find language bad enough to characterise them. Altogether they are a sorry lot—these great and gifted ones—and in their hands architecture is a living and progressive art no longer. It should be explained that Mr. Harper does not set out to "deal faithfully" with latter-day architects; it is only incidentally that he performs that painful duty. The object of his article is to point out how successive governments have neglected the arts, and especially architecture; how, when two courses presented themselves, they have perversely chosen the worse; how they have spoiled fine schemes with their hide-bound officialisms; how they have procrastinated and delayed, practising cheese-paring economies which have often proved costly extravagancies in the end. The indictment is one which in its main lines will not be unfamiliar to our readers, but it may serve, perhaps, as an eye-opener to the general public who do not read professional journals. Mr. Harper's article consists very largely of a simple recital of indisputable facts, and can hardly fail to convince the candid reader that in the matter of the provision of public buildings we have time after time left undone those things which we ought to have done, and done those things which we ought not to have done. Mr. Harper is the more likely to be listened to that his criticism is directed not against this government or that, but against an official tradition to the deadening influence of which all governments in this country—both Liberal and Conservative—seem to succumb.

Art in Belgium.

THE recent Vandyck celebration at Antwerp afforded us an opportunity of pointing out the widespread interest taken in artistic matters by the inhabitants of the little kingdom of Belgium, an interest which is in striking contrast with the indifference displayed by the masses of the population in this country. An even more striking illustration of the artistic sensibility of the Flemish people is afforded by a remarkable art exhibition lately opened in Ghent. The exhibition in question is not a mere local collection, but an International Art Exhibition of genuine importance, including as it does works of eminent British, French, Belgian, Dutch, and Spanish artists, selected evidently on a broad and Catholic basis, and hung in striking and admirable contrast with the haphazard methods of Burlington House. We, of course, are not unaccustomed to provincial art exhibitions, but the spectacle of a small provincial town organising a large international picture show of equal importance to that recently held at Knightsbridge is one that has no parallel in this country. The Flemish method of celebrating the artistic giants of their race—a week of festivals and street pageants—is one which we are not likely to emulate; indeed, judging from a recent article in the Paris "Figaro," it seems to fill even their artistic neighbours, the French, with amazement. We might, however, acclimatise their system of peripatetic exhibitions so as to give dwellers in the provinces an opportunity of seeing the pictures from time to time exhibited in London. If it were possible to rely on a sufficient degree of artistic interest amongst the English people to render such a venture financially successful, there would seem to be no reason why a picture gallery should not be sent on tour through the provinces just as is done with the best plays from the London theatres.

SPAIN:

Picturesque Cities & Monasteries in the North.

By F. HAMILTON JACKSON, R.B.A.

(Concluded from page 371, No. CCXXXIII.)

No. X.—HENDAYE AND FUENTERRABIA.

MOST of the Spanish railways run through fine scenery, the conformation of the country making it impossible to go any great distance without encountering a mountain range. The great towns, which were the capitals of kingdoms in mediæval times, generally lay in the plain, and to pass from one to another means surmounting or piercing the mountain ranges which divide them. Consequently railway travelling in Spain is exceedingly interesting, and one does not mind the deliberation of the trains by day (a slowness which has been much exaggerated, by the bye), for there is almost always plenty to observe and admire. And the long stoppings at the stations when the soldiers and country folk swarm around the "cantina," while annoying and wearying to the traveller whose journey is caused by business, or who desires for other reasons to get to his destination as quickly as possible, give the simple tourist the opportunity of seeing a great deal of the life of the countryside, if he be observant.

The line from Burgos to the frontier is no exception to the general rule. After leaving Castile it runs through the Basque provinces which are well timbered in many places, and the scenery of the hill ranges is very fine. The country near Burgos I am unable to describe, for we journeyed in the opposite direction, and night fell somewhere about Pancorbo; but from Miranda del Ebro, the last Castilian town (where one can buy simple food and pure wine incredibly cheap), the scenery is picturesque and interesting, becoming more so as the Pyrenees are approached. In the afternoon sun, the blue distances of finely-shaped mountains are lovely, the foreground, at least in spring, being of varied orange and tender green tints. The streams are bordered with trees, and the roads cross them by grey, ancient bridges of excellent design. The most picturesque part of the route lies between Vittoria and Tolosa Here the line pierces the mountain ranges, running up and across valleys, giving the traveller an excellent opportunity of appreciating the beauty of the landscape. One passes little streams brawling over their rocky beds beneath steeply precipitous banks, anon a weir checks their flow and they gather into still pools, on the other side of which may be a mill with a few cottages grouped around it almost the same colour as the rock behind them, and often scarcely distinguishable from it, or with a green meadow sloping to the stream and a few fine trees overshadowing it. Nearer the top of the pass one looks down upon ranges of hills with great masses of rock protruding from their slopes, and with trees scattered about, while everywhere excellent roads are seen which wind up and down, and appear and disappear round the spurs of the hills.

Near San Sebastian the land-locked bay of Pasajes is passed, an excellent harbour and a most picturesque place, and the frontier towns of Irun and Hendaye are soon reached; these stand on the Bidasoa, the river which divides Spain from France, Irun being the higher, where the frontier bridge crosses the river.

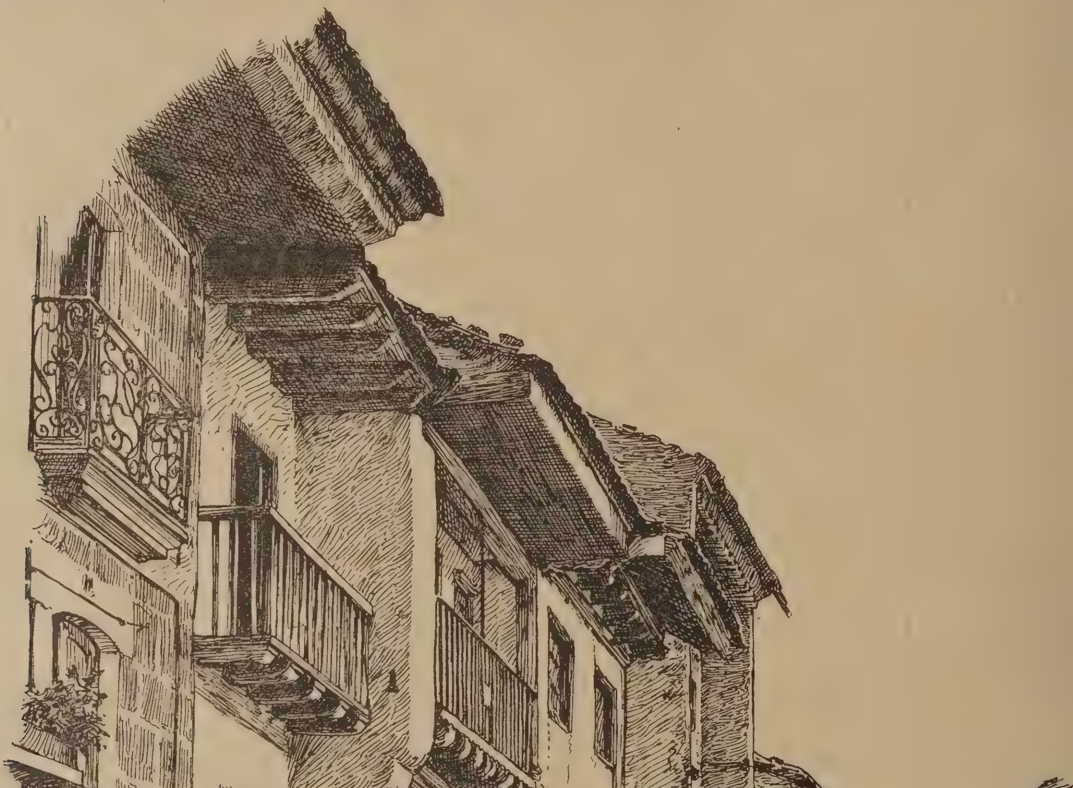
Hendaye on the French side and Fuenterrabia on the Spanish, look across the tidal river at each other from the rising ground on which each stands, both with their teeth drawn; for the Spanish fortifications were destroyed by the French in 1794, and at Hendaye there are only a few ruined bastions, overgrown with grass and brambles. In the river a gunboat lies close to the Spanish shore, and the sailors are often to be seen in the streets of Hendaye or in the market place, and fine, smart men they appear to be. The river is 14ft. deep at high water, but when the tide is out boats have to pursue a very winding course, with continual danger of sticking on the sand and mud banks. When this occurs one of the crew gets overboard and "shoves behind." The boatmen do not trouble to row at low water, but, standing, make use of the oar in a manner something between an English punter and a Venetian gondolier. They are a very mixed race, and one frequently comes across Basque types which might be Scotch, not in the least like one's preconceived ideas of the people of Spain or the south of France. It is as surprising as the first sight of a blonde Jew. Across this river Wellington led his army at low tide to attack Soult, who was posted on the slopes above Hendaye and expecting nothing so little. The resulting victory was one of the last feats of arms of the Peninsular war.

DRAWN BY F. HAMILTON JACKSON, R.B.A.

A little island in the river between this place and the bridge at Irun, the Ile de la Confèrence, called by the Spaniards for some reason the Isle of Pheasants, has been the scene of many royal meetings and conferences—lying between the two countries of France and Spain it is in a sense neutral ground. In 1463, Louis XI. of France and Enrique IV. of Castile met here to negotiate the marriage of the Duke of Guienne, when the paltry dresses of the French courtiers excited the contempt and indignation of the magnificently-attired Castilian noblemen. Here, in 1526, the exchange of Francis I., then prisoner to Charles V., against his two sons, who remained as hostages, took place. Here, in 1645, Isabella, daughter of Henri IV., and afterwards wife of Philip IV., was exchanged against the latter's sister Anne of Austria, as wife for Louis XIII. Here Louis XIV., in 1660, had a first interview with Maria Theresa, which was quite contrary to etiquette, and here the treaty of the Pyrenees was drawn up by Cardinal Mazarin and Don Luis de Haro. This was the most noteworthy event of the whole number, for Velasquez fitted up the saloon for the conference between his master and Louis XIV., and while doing so caught the fever from which he died.

For the traveller who enters Spain from this side it is well to stay the night at Hendaye, and make arrangements to see Fuenterrabia as his first Spanish town. It is extremely picturesque, and more Spanish looking than most of those between the frontier and Burgos. The boat pursues its devious course, following the deep water channel, and discharges its passengers on the shore nearly opposite the Spanish gunboat. Facing this vessel is a sort of landing place, with steps by which to ascend to the top of a river wall, and one naturally makes for these steps, only to be sternly waved away by a couple of soldiers on duty, and commanded to tramp a quarter of a mile along the muddy beach, accompanied by numerous boys who point out the best way of going with great zeal and expect corresponding "backsheesh"; the experienced traveller refrains from gratifying them. One reaches dry land at last by some little steps close to a sort of fish store—to judge by the smell!—from which a very good view of the outside of the town may be had, with the church tower most picturesquely crowning the hill. This tower is not very admirable from the architectural point of view, but, like many other such works in Spain, it is picturesque in its place. Bending to the left, without molestation from the custom-house officials, one passes a very unusual sort of rope-walk, wherein the labour is carried on under the pleasantest conditions.

A kind of pergola has been made of plane trees by training the branches towards each other, and inarching them, so that the whole of the trees are organically united; the branches being kept trimmed and pruned, throw out each year numerous short shoots, covered with leaves, which make a thick verdant roof, and the cool breezes blow without let or hindrance from side to side and end to end. In a plaza at the top of the town I saw the same arrangement, with seats placed beneath, and something resembling it also at Hendaye—but nowhere else. By a steep ascent the town gate is reached, after a sharp turn to the right. It is commanded by the walls on one side and by a tower on the other, lying in a deep re-entering angle, and bears above the archway the arms of the town carved in relief, a sundial, and a long painted inscription giving every information as to the name of the city (for it is a "Ciudad") and its judicial and provincial belongings, headed by a marvellous array of initials, M.N.M.L.M.V.Y.M.S.F., the meaning of which I am unable to interpret; a fig tree grows in the wall close by. The arms show an angel holding a key, a whale, and two syrens, and a castle between two stars. These were bestowed upon the town by Philip IV. in 1638, when the Prince of Condé was repulsed by the Admiral of Castile. At this time it was an important frontier fortress, and was placed under the protection of the Virgin of Guada-



Fuenterrabiá

DRAWN BY F. HAMILTON JACKSON, R.B.A.

lupe. The name Fuenterrabia is corrupted from the Latin "fons rapidus," because the town is situated on the swiftly flowing Bidasoa. It has a population of about 2500, most of whom appeared to be in or about the principal street on the occasion of my visit, for it chanced to be the morning of Easter Eve, and I had the opportunity of seeing one of the church pageants which we never see in England.

About half-way up the street on the left side is the town hall, and from the arcade on the ground floor a procession started which purported to represent the Roman soldiers on their way to guard the sepulchre, which was arranged in the church in front of the high altar. At the head were several musicians with French horns, on which they played a slow, mournful march, and the soldiers (who were dressed in imitation of Romans) let the butts of the spears which they carried fall with a crash on the stones at the commencement of each bar of the music. At a near view the get-up was rather over-theatrical for daylight, but from the bottom of the gloomy street, with its many overhanging eaves and balconies, tenanted by spectators, rising to the church tower at the upper end, the terrace in front of which was also crowded with the townsfolk, the procession both looked and sounded distinctly impressive. On entering the church the men took up their positions to right and left of the altar, the centurion kneeling in the centre by the effigy of Christ, and some service was gone through, after which the excitement appeared to be over and the crowd dispersed, leaving the soldiers watching by the tomb.

FUENTERRABIA FROM LANDING PLACE.

Above the church is a plaza, one side of which is occupied by the castle, which was built in the tenth century by the King of Navarre, Sancho Abarca; but the façade towards the plaza is now of the sixteenth century, and the one to the side was rebuilt by Charles V. There are many balconies both of wood and iron, wrought and cast, and most of them are good in design; also many large coats of arms, treated in a decorative fashion, carved upon the fronts of the houses. In mediæval times, the working of iron was an important industry of the town, both for home consumption and for export. There is record of a gun called "Columbyne," which was cast for our Henry VIII., at "Fountrabye in Spaine," at a cost of £18 10s. 0d.

The coast from hence to San Sebastian is very stern and forbidding, and the long Atlantic rollers break upon the beach with a splendid display of foam, as they do at Biarritz, the rumble being audible for some distance inland; but it is from Hendaye that one gets the sea view, Fuenterrabia lying a little way up the river, masked by a projecting headland; and, of course, there are the usual French watering-place erections on the shore there. The village, or town, is much of it quite old, and many of the houses bear a certain resemblance to Swiss and Tyrolese buildings, but without the lavish use of external woodwork which often characterises them. There is a fine road, which winds along above the river, from which a good view of Fuenterrabia on its hill may be seen, with a mazy foreground of winding channels through the sand at low water. Along this road many of the country people may be met with in the early morning, bringing small wares to market—a woman with a white hen under one arm and some eggs or green vegetables in a basket on the other; others with pots on their heads, walking with stately step; a boy with mushrooms in a basket, or with carrots and leeks; or a man and a boy with a donkey laden with other produce. Perhaps a bullock cart may come by drawn by a yoke of beautiful pale brown beasts, their horns wound about with a skin—one man walking in front with a goad or staff, and another behind with the cart, which may be loaded with wood, or have a couple of calves in it, or some little pigs. I did not see among the wares the liqueur for which Hendaye is celebrated; it must be sought in the shops. The market is held in a long "place," near to the church, under the shade of small plane trees, and is a very busy scene up to ten o'clock. The costume of both

DRAWN BY F. HAMILTON JACKSON, R.B.A.

men and women is strange to English eyes, though there is a good deal of Manchester point visible. The women wear a handkerchief bound tightly round their heads, sometimes black, sometimes of rich and bright colours, which often entirely covers the hair. They also wear a curious sort of sandal shoe made of felt, which is worn by the men too, the ties varying according to taste apparently.

The church is very curious in its internal arrangement. There are three wooden galleries, which run round three sides, leaving the east end free, one above the other, like the circles at a theatre, and from the lowest the pulpit projects, having its special staircase. The wood work is quite Swiss in appearance, the fronts of the galleries being just like the fronts of balconies and external galleries in Switzerland. That at the west (which contains the organ) is supported by two octagonal stone pillars, around which the basins are arranged to hold the holy water. The staircases to the galleries are external, and start close to the west door, which opens under the tower, the lowest storey of which forms an enormous open porch. There are a few remnants of bastions down by the water, as has been remarked, and one house near the church appears to occupy a tower which belonged to the ancient walls, but these are all now left to testify that the place once had military importance. Around tower the lofty mountains, and to the south-west is seen the broken line of the spurs of the lower chains of the Pyrenees, among which the two streams which, united, make the river Bidasoa, take their rise.

BUILDERS' JOURNAL COMPETITION.

DESIGN BY "THISLIXUM."

THE following notes accompanied the design by Mr. Thomas H. Smith ("Thislixum") which we reproduce this week in our centre plates :—

This design comprises on the ground floor: Hall to be used as sitting-room, with staircase and gallery round three sides, study, boudoir with ingle nook, dining-room with bay and ingle, lavatory, w.c., and usual domestic offices, cycle house and kitchen yard.

On the first floor: Six bedrooms, three servants' bedrooms, two bathrooms (one for the use of the best bedroom), and w.c.

The servants' bedrooms are shut off from the rest by a door in the corridor. The bathrooms, lavatory, and w.c. adjoin, and are placed over the lavatory on the ground floor, and with the exception of the kitchen sink waste, all the drainage is kept on one side of the house. The best rooms and the chief of the bedrooms have been placed on the south-east side as the most cheerful. The hall has an open timber roof, and a large ingle nook under the gallery. The trusses, rafters, and wall pannelling to be executed in oak slightly fumigated to a deep colour.

A verandah is placed on the south-east side and is reached from the bay in hall. The door is so placed as to prevent draught. Access to the balcony above is from the landing on the stairs.

Red bricks, rough cast, and unwrought half timber work, together with straw or reed thatch and pan tiles for the roofs are the materials employed externally. The rough cast to be lime-whited, and the timbers stained black. The roof at eaves to project about 2ft. 6in., and 1ft. 3in. at gables. The entrance doors to be painted sage green and twice varnished. The rest of the external joinery to be painted white. The joinery to reception rooms to be finished in flatting coats. All other joinery to rooms to be painted. The windows to be glazed with clear glass in leaded lights in squares of 5in. or 6in. wide and about 7in. high. The cost is estimated at £2,050.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

WATER AND DRAINAGE WORKS AT PORTLAND.

THE Western Counties district meeting of the Association of Municipal and County Engineers was held at Portland on August 26th. The members met at the Royal Hotel, Weymouth, where the business proceedings of the meeting were transacted. Mr. W. Harpur presided. Mr. J. Lano, chairman of the Portland District Council, welcomed the members of the association to the ancient manor of Portland. Mr. Hall, at the proposal of Mr. Yabbicom, was re-elected honorary district secretary. Subsequently a paper was read by Mr. Ernest J. Elford, surveyor to the Urban District Council of Portland, on new Portland

Water and Main Drainage Works.

He said that the water question had been a source of worry to the local authorities for several years. In 1871 the Local Board pledged themselves to supply a pure and adequate supply and an efficient system of drainage, but nothing was done until 1889. Then the matter was earnestly taken in hand, and it was decided to sink a well near the village of Southwell. The work was begun in 1891, and the shaft was sunk to a depth of 206ft. After a period of thirty-five days' continued pumping from the well, the average yield was found to be at the rate of 116,000 gallons per twenty-four days. Dr. Frankland, analytical chemist to the Local Government Board, was furnished with a sample of the water, and reported that it contained a large proportion of sea-water, mixed with land containing a considerable amount of decomposed sewage. This was a surprise and a disappointment, and as the works had already cost about £7,500, the Council were placed in

An Awkward Position.

In spite of difficulties, however, they considered it their duty to give the district an efficient supply of water. He recommended the Council to abandon their scheme as he thought it was impossible for them to obtain an adequate and pure supply. Subsequently the Council were approached by Captain Gould, who offered to sink a well and obtain a sufficient supply of water on his estate at Upway. The well was sunk, and in February, 1896, water was found at a depth of 20ft. below the surface, and on March 10th and 11th, a test of twenty-four hours continued pumping resulted in a total yield of 400,000 gallons. The council therefore decided to take over the well, and sank it to a further depth of 6ft. with Captain Gould's permission. The yield came up to 750,000 gallons in twenty-four hours. Dr. Frankland examined a sample of the water and reported it to be of excellent quality and *above the average* of chalk waters. On July 2nd a letter was received from the Local Government Board requesting the Council to at once discontinue the test pumping and all other works connected with the well, and informing them that the Board would not sanction the borrowing of any money for the construction of waterworks to be supplied from the well, "because of the possibility of contamination from the village churchyard." This churchyard had practically been in disuse for many years. It was situated at a distance of about 100 yards from the site of the well, and on the opposite site of a valley through which a stream of water flowed, and on a bed of practically impervious soil about 10ft. thick. The Council felt that it would no doubt cause great delay, and would probably be useless to oppose the Local Government Board, and they therefore immediately entered into negotiations with Captain Gould to acquire another site upon which to sink a well. Ultimately

A Fresh Site

was agreed upon and sanctioned by the Local Government Board after three visits had been made by their inspectors. A loan of £500 was obtained and a contract entered into with Messrs. B. Coode and Co., of London, for sinking the well and subsequently carrying out thirty days' test pumping. On the same day as that upon which the Council sealed this contract, notices were published of the intention of the Weymouth Water Company to apply to Parliament in the ensuing session for powers to supply certain parts of Portland, including the Government establishments. The people of Portland keenly resented this effort of a local monopoly to take from them their powers and privileges, and render ineffective their endeavours to put into operation the powers the legislature has conferred upon them. In the meantime the well at Upway was sunk to a depth of 100ft, and a 12in. borehole to a farther depth of 70ft. The test pumping was then proceeded with and resulted in

An Average Yield

of about 280,000 gallons per day, being 80,000 gallons in excess of the quantity required by the Local Government Board. A sample of the water was sent to Dr. Frankland, who reported that "this water possesses an extremely high degree of organic purity and is of the most excellent quality for dietetic use." The Weymouth Company's Bill passed its second reading in the House of Commons and was referred to Committee. The Committee stage lasted about three weeks. Unfortunately the Admiralty supported the Company, and in the end a compromise was effected under which the Company obtained powers to supply the Admiralty with a limited quantity of water for fifteen years; the Council to have the right to lay the mains required for this purpose, which would lie within their own district, and also the right to take the water from the Company at the boundary of their district and themselves supply it to the Admiralty. The Council were successful, therefore, in their endeavour to keep the Company outside the island, but their effort to keep out the Company's water entirely was only rewarded with partial success. Mr. Elford then proceeded to prepare *his scheme in detail*, and the Local Government Board was asked to sanction the raising of a loan of £37,500 to construct the necessary works. The works were commenced on April 7th last year, and included the sinking of the well to an additional depth of 66ft. and the driving of headings, the construction of the pumping station, and provision and installation of the machinery and boilers, the construction of the service reservoirs, and the provision and laying of about 20 miles of cast-iron pipes.

The Total Yield

of the headings at the time of writing was 140,000 gallons daily, but as the yield of the shaft had decreased (owing to the dry season) to about 260,000 gallons, the total yield did not exceed about 400,000 gallons a day. The quantity of water which the Local Government Board required to be provided was 200,000 gallons per day. His scheme for the drainage of Portland had formed the subject of a Local Government Board inquiry on May 26th last, which was held by Mr. Boulnois, who expressed satisfaction with the scheme. The total

Cost of the Scheme,

including the renewal of all old sewers, was estimated at £24,000. Unfortunately, the Council were not at the present time in a position to borrow this sum without so far increasing the total amount of outstanding loans as to exceed the limit of double the rateable value. They intended, therefore, to commence immediately the construction of the most urgent portions of the works, and in all probability by the time these were completed the amount of the present loans which would have been paid off, together with the increase in the rateable value, would be sufficient to enable them to borrow the sum necessary to complete the whole scheme.

Subsequently a visit was paid to Portland, where the torpedo works and workshops at Portland prison were gone over.

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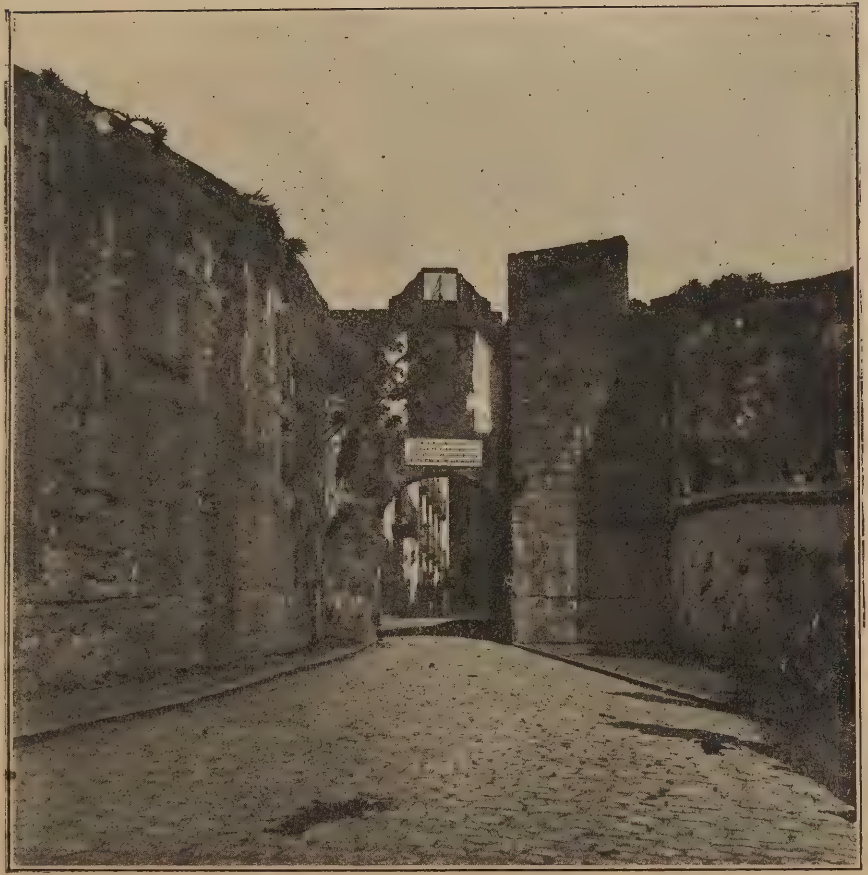
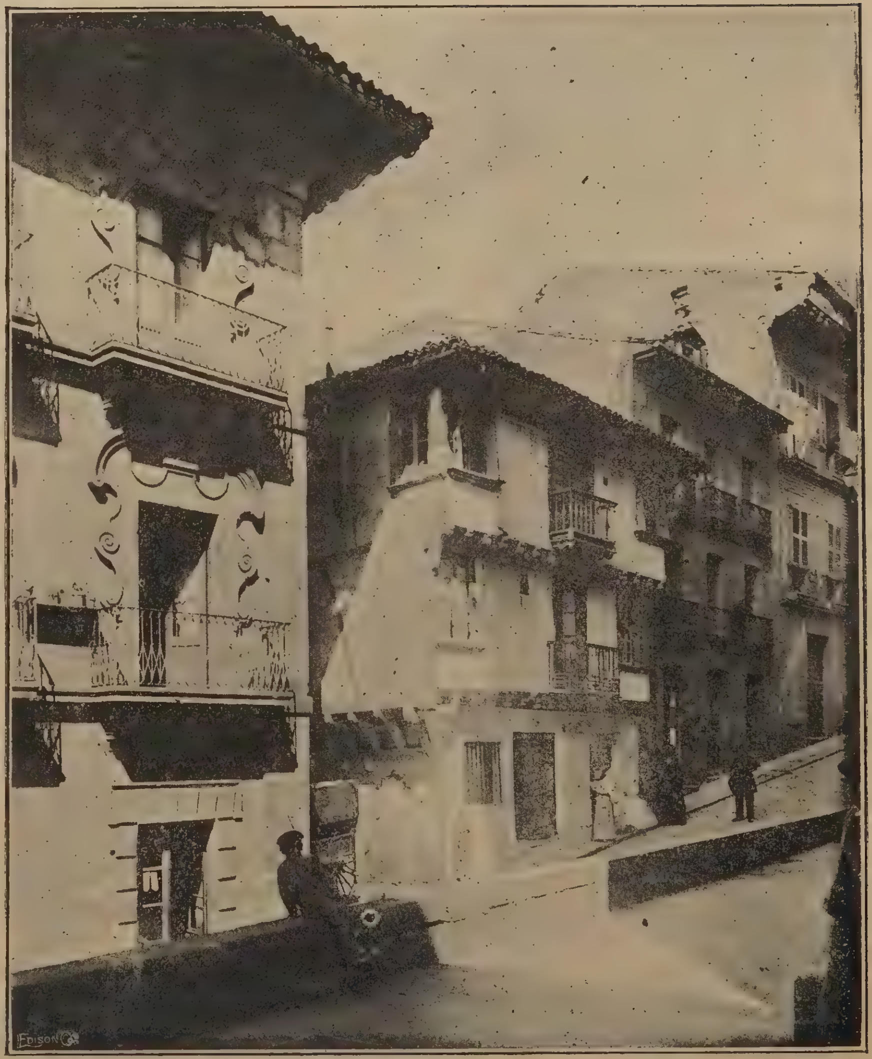
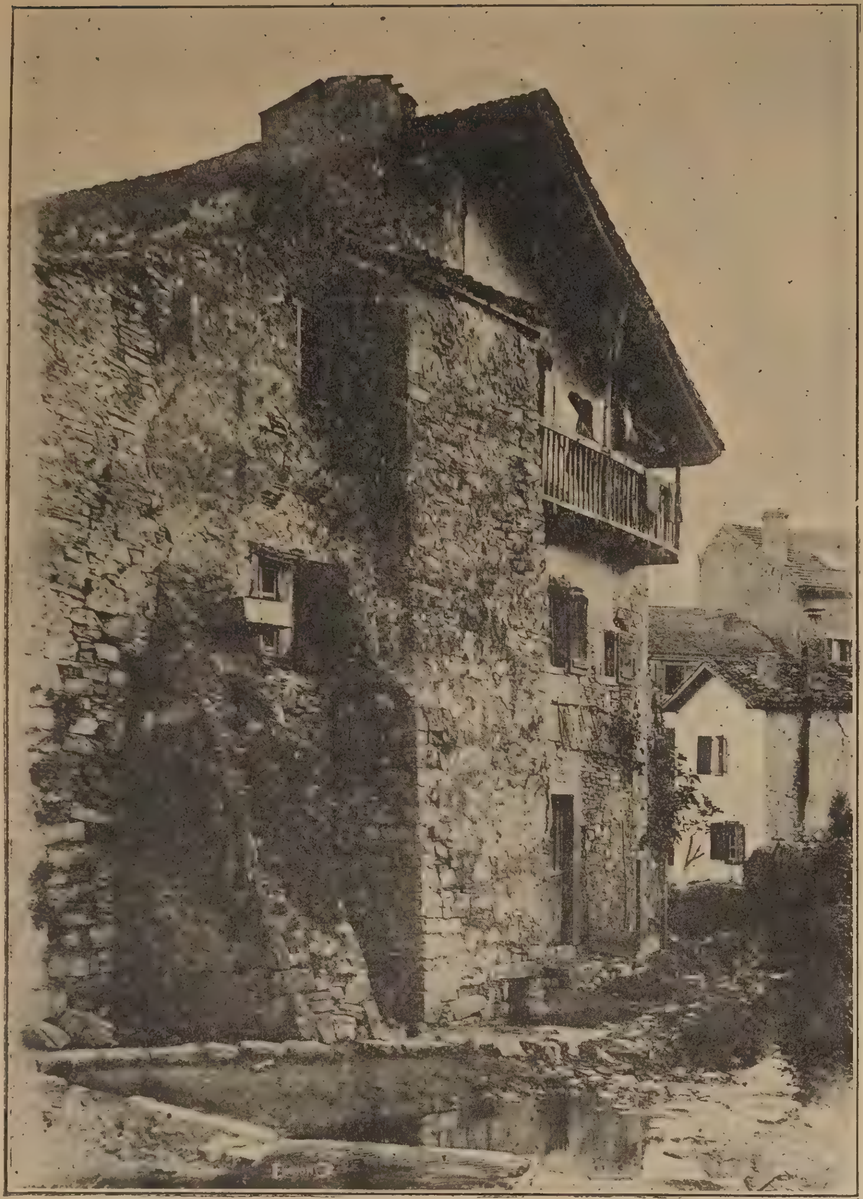


CITY GATE, FUENTERRABIA.

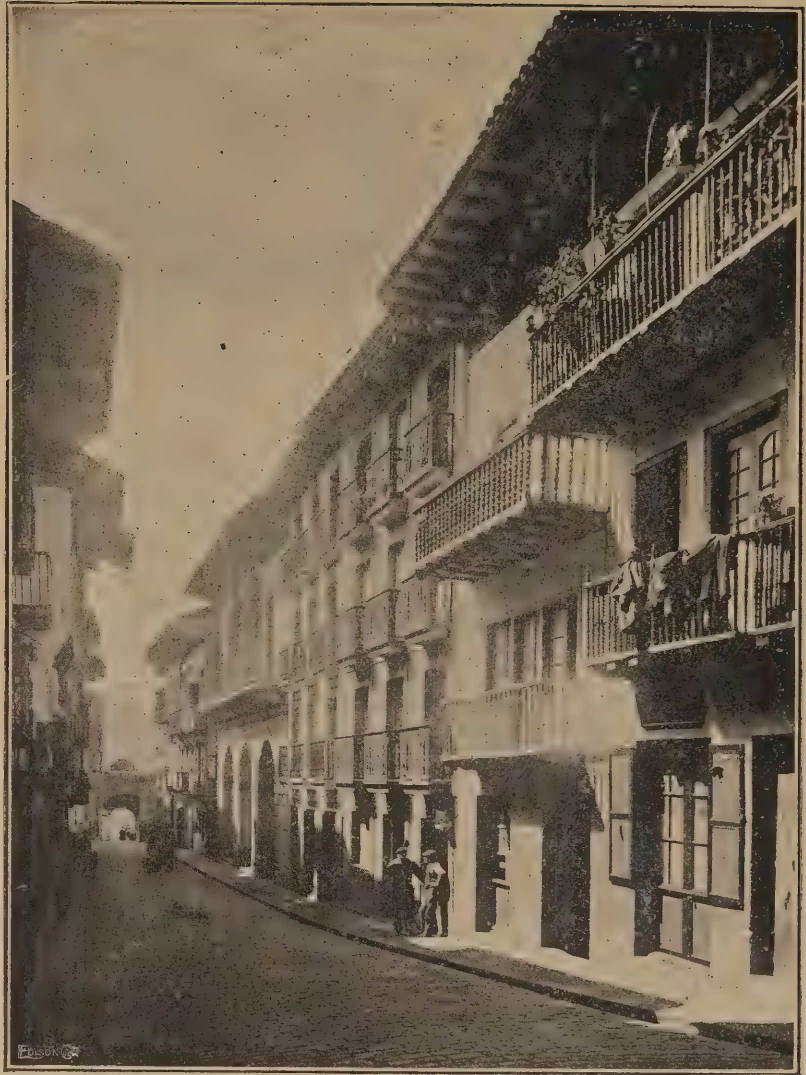


HOUSES OPPOSITE THE CHURCH, FUENTERRABIA.

SPAIN: PICTURESQUE CITIES AND MONASTERIES IN THE NORTH. (*See* p. 67.)



COTTAGE AT HENDAYE.



MAIN STREET, FUENTERRABIA—LOOKING DOWN.

SPAIN: PICTURESQUE CITIES AND MONASTERIES OF THE NORTH. (*See* p. 67.)

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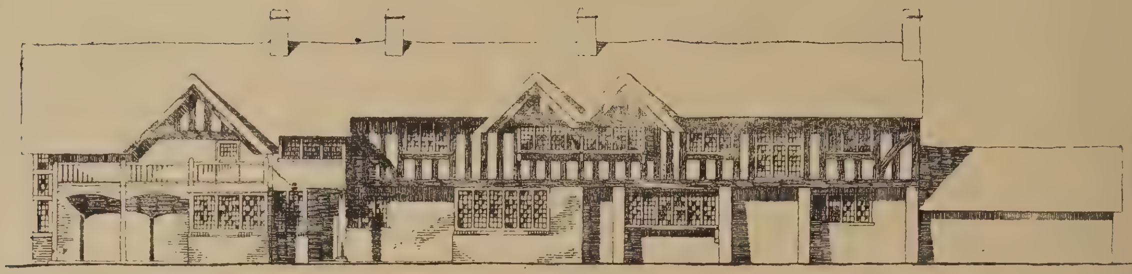
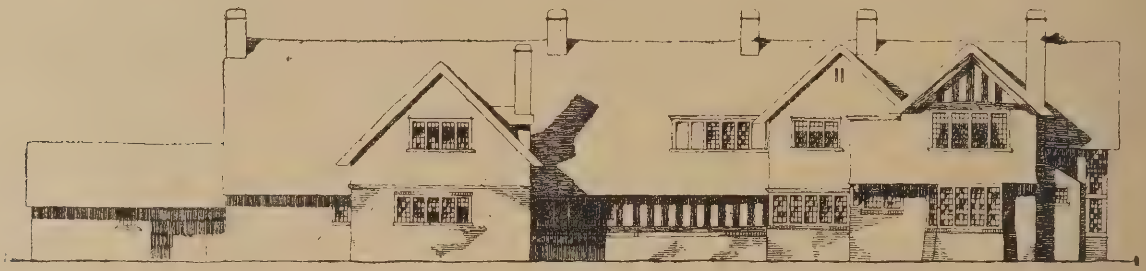
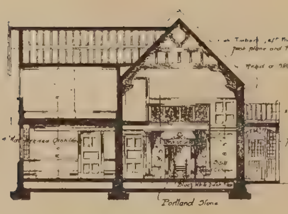


S.E. Elevation.

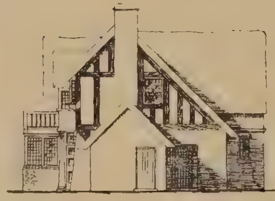


N.W. Elevation.

Scale of Feet.



Section C.C.



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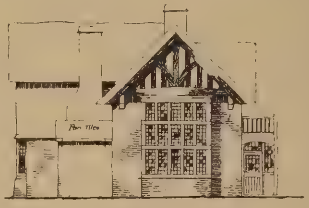
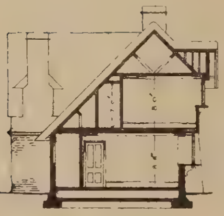
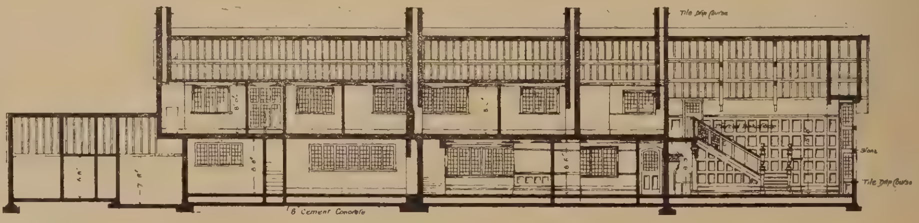


S.W. Elevation.



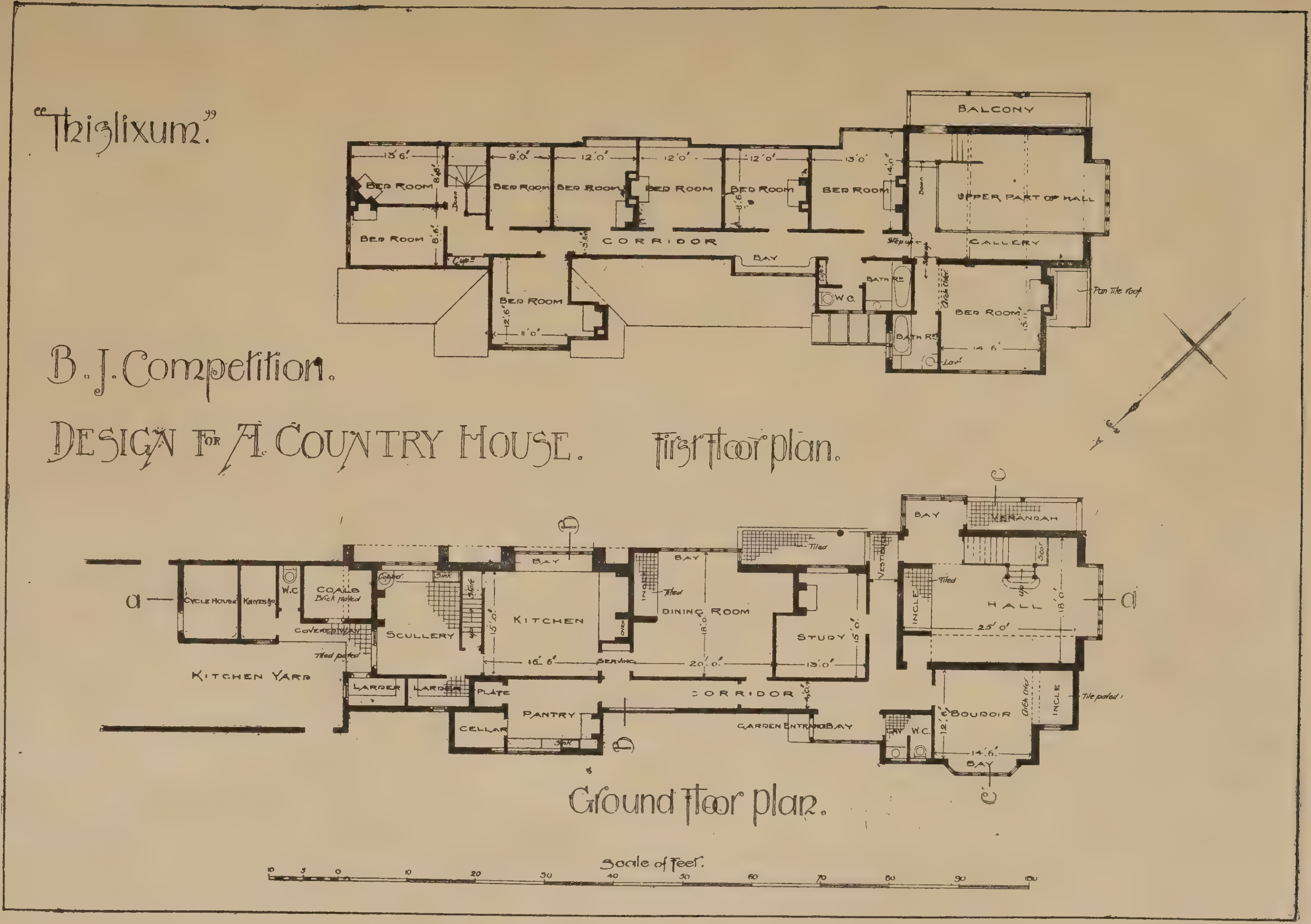
Section B.B.



Section A.A.

Scale of Feet.

"BUILDERS' JOURNAL" COMPETITION: HIGHLY COMMENDED DESIGN. By Thomas H. Smith—"Thislixum."
(*See* p. 70.)



"BUILDERS' JOURNAL" COMPETITION: HIGHLY COMMENDED DESIGN. By THOMAS H. SMITH—"THISLIXUM." (*See* p. 70.)

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DISPUTED POINTS UNDER THE LONDON BUILDING ACT.

By GEORGE H. BLAGROVE,

Certificated Surveyor under the Act; Author of "Dangerous Structures," "Shoring and its Application," &c.

I.—THE USES OF BUILDINGS.

THE London Building Act, 1894, is distinguished amongst our building laws for its minutely regulative character. Since the Act of 1855 successive Amendment Acts and by-laws have from time to time assisted to extend the scope of regulative supervision; and now we have an Act more far-reaching and comprehensive than any which have preceded it. Some of its provisions are only beginning to be understood amongst architects and builders, while the general public are still in ignorance of regulations closely affecting the internal arrangement of their homes. Occasionally owners of buildings are surprised into indignant protests against what is regarded as undue legislative interference; and it cannot be denied that anomalies, and even hardships, will arise in isolated instances through the application of some sections of the Act; but, on the whole, it must be pronounced to be a beneficial measure, conceived in a broad and liberal spirit, with a due regard for the various interests affected.

A marked feature in the present Act is the stress which it lays upon the uses of buildings or parts of buildings. It has become almost impossible to plan a building in conformity with the Act without knowing the precise purpose for which each part of it is intended. But building speculators are not always willing to decide beforehand the uses to which their buildings shall be applied; they would rather leave such questions to be settled according to the wishes of future tenants. Under such circumstances an architect may be placed in an awkward position. Will he guarantee that the majority of the rooms will be let as offices or counting-houses? If not, he cannot claim the exemption provided in Section 39 as to open spaces in the rear of buildings. Is he sure that all the rooms over a shop will be let exclusively for trade purposes? If not, when the building exceeds 1,000 square feet in area he must separate the part used for trade from the other part by means of fire-resisting floors and partitions, and must provide fire-resisting approaches, &c., to the residential part. Can he undertake that certain lower rooms will not be occupied, either as bedrooms, or as living rooms during the day? If not, he ought to sacrifice such portions of his building as would intercept a certain angle of light to certain windows, according to rules explained in Section 45.

What is a Domestic Building?

It is sometimes difficult to distinguish between a domestic building, a public building, and a building of the warehouse class. In a case that came under my notice a professional institution, to which members obtained admittance by payment of an entrance fee and annual subscription, was classed as a domestic building apparently because it contained some rooms which might be let for residential purposes. Had it not been for this circumstance, I should say that it would have been a building of the warehouse class, which is defined in Section 5 (28) to mean "a warehouse," &c., ". . . and any other building, exceeding in cubical extent one hundred and fifty thousand cubic feet, which is neither a public building nor a domestic building." It could not have been classed as a public building because the public had no right of entry into it, either by payment or otherwise.

A Stable is a Domestic Building.

That a stable is a domestic building, even when it does not comprise living rooms, was decided in the case of *Hewitt* v. *Kirk and Randall*. The magistrate arrived at his decision by what I would call a process of elimination. He said: "In the interpretation clause the Act says—I speak generally—a public building or warehouse is not domestic, and by Section 39 it says an office or counting-house is not domestic,* which leaves it to be inferred that all other buildings must be so considered. . . . The space occupied by the new building . . . is 111,555 cubic feet, which takes it out of the warehouse class, which must exceed 150,000 cubic feet†; and it is not constructed to be used as an office or counting-house, and it is not a public building. The preamble of the Act speaks of securing more light, air, and space round buildings, and that may perhaps be a reason for excluding buildings where people do not generally dwell, but might well include buildings like the present where horses are stabled."

The question naturally suggests itself, whether a stable building which exceeds 150,000 cubic feet in extent, and comprises no living room, should still be classed as a domestic building? Common sense suggests that if the open space in rear required under Section 41 is necessary for a small stable, it is equally so for a large one. Most district surveyors appear to hold this view, and I am informed that they are supported in it by the expressed opinion of legal advisers to the London County Council.

A Stable Can be a Building of the Warehouse Class.

Notwithstanding that a stable is a domestic building for the purposes of Part V., it appears that it may, under some circumstances, be a warehouse building for the purpose of determining the thicknesses of its walls. A case came under my notice in which the cellars under a brewery were connected with a cellar under a stable by means of a subterranean passage which formed a rolling way for casks. The district surveyor claimed that the stable building was a part of the brewery, and that the thicknesses of its walls must be regulated by Part II. of the First Schedule of the Act. The point was not contested, and I do not think that it could have been with success.

Trade Uses.

The fact that a building is used for purposes of trade or manufacture does not necessarily bring it within the warehouse class; for there are many trades which may be termed domestic, inasmuch as they may be carried on in dwelling-houses. The house in which a tradesman lives over his shop is certainly a domestic building; and it would come under the same designation if its upper rooms were let as offices, or for purposes of domestic trade. The use of rooms as offices must rank as domestic use; for Section 39 provides that buildings used wholly or principally as offices or counting-houses are not domestic buildings for purposes of Part V. (relating to open spaces); and the inference is that they are domestic buildings for purposes of every other part of the Act. The question, whether a shop should rank as an office for purposes of Section 39, has been disputed; but it appears to me that the mere fact of a shop containing a cashier's desk should not entitle it to rank as an office. If this be the true view—and I have known it maintained by district surveyors—it ought to follow, conversely, that an office or counting-house is not a shop within the meaning of the Act.

What is a Dwelling House?

The question of trade uses gives rise to complicated conditions, at times, in cases under Section 74—2, especially when old buildings are adapted as shops. This section, it will be remembered, provides that "in every building exceeding ten squares in area, used in part for purposes of trade or manufacture, and in part as a dwelling-house, the part used for the purposes of trade or manufacture shall be separated from the part used as a dwelling-house by walls and floors constructed of fire-resisting materials, and all passages, staircases, and other means of approach to the part used as a dwelling-house shall be constructed throughout of fire-resisting materials." It has been doubted whether part of a building consisting only of offices used during the day should be deemed to be used as a dwelling-house for purposes of Section 74—2. Section 5 (25) defines a dwelling-house as a building used "wholly or principally for human habitation." Does use as an office, then, amount to habitation within the meaning of the Act? An "inhabited" room, according to Section 5 (37), means a room in which some person passes the night, or which is used as a living room. The latter expression would appear to mean a room which is occupied continuously during the day, and would therefore include an office. So far as my experience goes, offices and workrooms are generally regarded as habitable rooms within the meaning of the Act, while rooms for occasional use only, such as for meals, &c., are not so regarded.

That occupation as offices is equivalent to use as a dwelling-house for purposes of Section 74—2 may be inferred from Section 74—3, which provides fire-resisting construction in buildings exceeding twenty-five squares in area, and containing separate sets of chambers or offices; for it appears to be the intention of the Act to provide fire-resisting construction for the protection of persons occupying offices, whether sleeping on the premises or not. At the same time, with regard to the requirements of Section 74—2, it is conceivable that a building might be used in part for purposes of trade, and in part for purposes other than trade and other than as a dwelling-house.

The Case of Carritt v. Godson.

In the recent case of *Carritt* v. *Godson*, the question of what constitutes use as a dwelling-house under Section 74—2, was decided in the High Court in regard to a public-house. I wish to draw attention to the special and limited character of the decision. The building in question exceeded ten squares in area, but the Court held that it was exempt from the requirements of Section 74—2, on the ground that the entire premises were licensed, and were used, in some sort, for the entertainment of guests; so that the part used for trade could not be separated from the part used as a dwelling-house. One of the judges took notice of the fact that there was a fire-resisting staircase leading into a yard, which could afford means of escape in the event of a fire. May we suppose that his decision was in any way influenced by this fact? At any rate, this decision cannot be construed to mean that a public-house is not used for trade purposes within the meaning of Section 74—2, nor does it appear to affect the case of a house not fully licensed. We may therefore watch with interest the results of any other case of the kind which may be brought into a court of law.

(*To be continued.*)

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* Only for purposes of Part V.

† See Section 5 (28).

North Walsham Town Hall was Burnt Down last Sunday week. All the furniture and County Court fittings were destroyed.

A Memorial to Soudan Soldiers was unveiled recently in St. Nicholas Cathedral, Newcastle, by the Duke of Northumberland. The memorial is a brass tablet.

New Theatre for Walsall.—The foundation stone of a new theatre to be called Her Majesty's has just been laid. The cost of the building, which is being erected by Messrs. Whittaker and Co., from the designs by Messrs. Owen and Ward, of Birmingham, will be between £20,000 and £30,000.

New Bridges at Glasgow.—The Bridges Sub-Committee of the Statute Labour Committee have agreed to recommend that the contract for the two new bridges over the Clyde at the East End, to be constructed of the material from the present service bridge at Jamaica Street, be given to Mr. William Kennedy, of Partick. The cost is over £7,000.

Proposed new Workhouse for Southwark.—The Local Government Board have written to the St. Saviour's (Southwark) Guardians a letter refusing to sanction the purchase of forty-three acres of land at Burnt Ash Hill, Lee, for the purpose of erecting a workhouse. £500 an acre was to be given for the ground, and the total cost was estimated to be £150,000.

MODEL ANSWERS TO EXAMINATION QUESTIONS.

Answers to Questions set in the Examination held by the Society of Architects in April, 1899.

BY G. A. T. MIDDLETON AND R. W. CARDEN, ASSOCIATES R.I.B.A.

(*Continued from page 26, No. CCXXVI.*)

NOTE.—*It should be understood that the sketches given in this series of papers are purposely only very roughly finished, as the amount of work candidates are expected to do is so utterly out of proportion to the amount of time allowed. At the same time sketches should show sufficient detail to emphasize all the principal points. The sketches are reproduced on a reduced scale; they should, of course, be drawn considerably larger.*

II.—ARCHITECTURAL HISTORY.

(Part II.)

5. *Describe briefly and give outline plan, and elevation of one bay of nave from one of the following cathedrals: Ely, Peterborough, or Durham.*

ELY.—The present cathedral at Ely dates back to 1081, but only a small portion of the work of this period remains. The nave is Norman, and, as is usually the case with these buildings, only the aisles are vaulted, the nave itself being covered by a flat timber roof. The transepts are Early English, approaching almost to Decorated. The choir and lady chapel are Decorated, and peculiarly rich and elaborate specimens of the style. It has a square east end, and the lady chapel is situated just beyond the north-east angle of the north transept. It is in the treatment of the crossing that the chief interest of this cathedral lies. Originally it had been crowned by a massive tower, but this fell down and was replaced in 1322-42 by an octagonal lantern from the design of Alan of Walsingham. It will be seen from the plan (reproduced on the opposite page) how the octagon was worked in to suit the already fixed dimensions. The centre aisles of nave, choir and transepts gave the principal sides, the other four being obtained by throwing arches diagonally across the junctions of nave and transept aisles and choir and transept aisles, omitting the four columns which in any other cathedral would have stood at the points XXXX. It measures 65ft. from east to west, and 70ft. from north to south. The upper part, though intended to have been built in stone, is only of wood.

The Lady Chapel is of great beauty, 100ft. by 46ft., by 60ft. high, big enough for a parish church. The Galilee at the west entrance is also an elaborate piece of work, in two square bays, with good vaulting and rich wall arcading.

Dimensions, 545ft. long over all; nave and aisles, 106ft. wide; choir and aisles, 100ft. wide.

Peterborough.—The cathedral at Peterborough was commenced in 1117, and is principally of the Norman style. Its choir has a semicircular end, though the aisles are not continued round it as was the case abroad. This retro-choir was added between 1438—1528, and is Perpendicular in style, with elaborate fan vaulting. The transepts have only one aisle (on the east).

The noticeable point of Peterborough Cathedral lies in the west front. Erected in 1233, it consists of three great arches nearly 50ft. span, and running the whole height of the building. Each arch is gabled, and the abutments of the end arches are carried up as towers, weighted down by spires. A porch or chapel of late Perpendicular style was added between the central columns about 1500.

Durham.—Durham Cathedral is principally Norman in style, about 1100. Roughly speaking, it consists in plan of a long rectangular nave and choir and three distinct pairs of transepts.

Durham has two principal features:—1st: The Galilee at the west end. This was erected in the very last stage of Norman, almost, if not quite, transitional to Early English. It is rectangular in plan, four square bays east to west by five north to south. The profuse use of the zig-zag ornament is worthy of notice. 2nd: The eastern transept called the Chapel of the Nine Altars. This is Early English of the most "robust" description, erected in 1273.

The massive nature of the interior will be seen to some extent from the plan. (For illustrations see the opposite page.)

6. *Give a short illustrated description of one of the following palaces:—"Farnese," "Riccardi."*

(The wording of this question is a little loose, for there are certainly two, and probably more Palazzi in Italy, erected by the Farnese family. There are actually *two* Palazzi Riccardi in Florence alone, though one is now called "Palazzo Mannelli Riccardi ora Gattai Budini," to distinguish between them. We assume that those referred to are the ones quoted in most text books—Palazzo Farnese, in Rome, and Palazzo Riccardi, in Florence, by Michaelozzi).

The Palazzo Farnese, in Rome, was commenced about 1535 by Antonio di Sangallo. He died in 1546, and Michael Angelo Buonarroti completed it. In plan it consists of a great rectangular block with the usual Italian feature of a spacious "cortile," round which runs on the ground floor an open arcade, carrying the main wall of the apartments above. The principal front is chiefly noticeable for its breadth and simplicity. The ground floor contains only a row of simple windows, with a heavily rusticated, yet still simple doorway in the centre. The first floor, an almost equally simple row of windows, surmounted alternately by straight-sided or segmental pediments, the only ornament being three shields of arms over the central window. The second floor (built by Michael Angelo) another row of simple windows, semi-circular headed, and crowned by straight-sided pediments. Above this a great elaborate and spreading cornice proportioned to the height of the whole building.

This face of the building shows how well breadth and grandeur may be obtained in combination with simplicity. The ornament is almost entirely confined to the cornice which is considered the finest thing of its kind in the world.

The same broad and simple treatment is applied to the wing portions of the garden front, but the centre is broken, and treated quite differently, the ground and second floors having open "loggie" in three arcades, and the first floor having a corresponding wall arcade with half columns and pilasters.

The Palazzo Riccardi at Florence was erected in 1430. It is said that Bramante commenced it, but it is certain that Michælozzo Michælozzi completed it, if he is not responsible for the whole work. It consists in plan of a great unbroken rectangular block. In elevation it is divided into three horizontal compartments. The lowest is heavily rusticated (there was always a possibility of these Palazzi having to be defended against an enemy) with small pedimented windows slightly recessed into non-rusticated spaces, spanned by rusticated semi-circular arches. The first floor is of smooth-faced masonry with sunk joints. The windows of this floor consist of two semi-circular headed lights grouped under a larger semi-circular arch, treated similarly to the walling. The space in the arch-head is filled by a medallion. The second floor is of plain masonry with windows treated very much like those in the floor below. The whole is crowned by a great cornice proportioned to the whole height of the building. (See illustrations on opposite page.)

7. *Give a description of a few of the principal works of either Sir Arthur Blomfield or R. W. Edis.*

(There would be only time to describe about two buildings, three or four others being just mentioned.)

The work of Sir Arthur Blomfield is mostly, if not entirely, Gothic in style, and is accordingly most appropriately chiefly ecclesiastical. He built St. Mary's Church, Portsea, turned St. Saviour's, Southwark, into the cathedral of the diocese of Stepney, built the Church House, Westminster, Sion College on the Embankment, and executed many other works. The Church House, Westminster, is a rectangular hall seven bays in length. Projecting from it on the west is a very fine porch. The style of the building throughout is Perpendicular, amended, if one may so term it, made practical and brought up to suit nineteenth century requirements. The west entrance consists of a broad four-centred arch with contraflex and crocketted hood mould, surmounted by the usual terminal. This is flanked by buttresses whose upper water tables "tumble" in below the parapet which follows the flat curve of the roof. The space thus enclosed is given to a five-light window with elaborate traceried heads following the slope of the roof. Across the bottom of the window is a transom, below which is a series of five empty niches corresponding to the lights above. This porch is flanked by wing walls. Behind this rises the main wall of the hall, with a fine window, which unfortunately is to some extent hidden by the porch. The principal points are, briefly:—The main wall following the steep pitch of the main roof, with large octagonal turrets at the lower angles. In the centre of this gable a seven-light window with four-centred arch, flanked by miniature buttresses much elongated, and carried above the gable slope line, pinnacled and crocketted. The principal mullions of the window are continued up through the arch-mould, with heads foiled and multifoiled. A bold string course is carried across the gable above the apex of the window arch, above which are niches, the centre one having a fine canopy, and containing a figure of Christ; the next niche on either side contains also a figure.

In side elevation, each bay is boldly marked by a buttress carried well up above the parapet, and crowned by, *not* pinnacles, but Elizabethan chimneys. Between the buttresses, on the ground stage, are small single-light windows, with somewhat similar ones above; above these, larger windows in four lights with four-centred heads in square frames, occupying the whole space between buttresses.

The east end is simple and plain.

Sion College.—This is in the same late Perpendicular style. The front to the river consists of:—

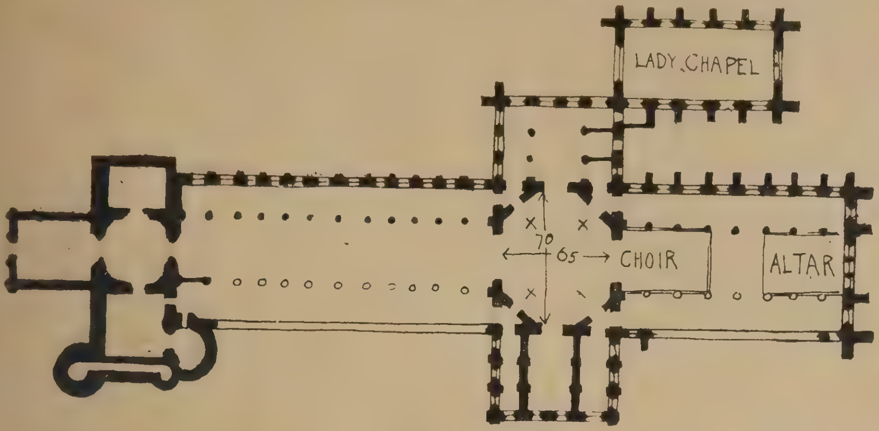
To the right, an entrance porch with four-centred arch and canopy of double curve, with crockets and finial. Above this is a pair of two-light windows, separated by a niche with canopy and pinnacles; and above this the gable follows the flat pitch of the roof, with small pinnacles at its lower angles. This porch projection runs a fair way back, the side having on the lower stage a small door flanked by two simple windows, all under a great three-centred arch. The upper stage is divided into panels, alternate ones being pierced as windows.

In the centre is the main portion, with a large five-light window, flanked on one side by an octagonal turret, on the other, by a simple buttress. Below this window is an arcaded band, and below this again a range of windows.

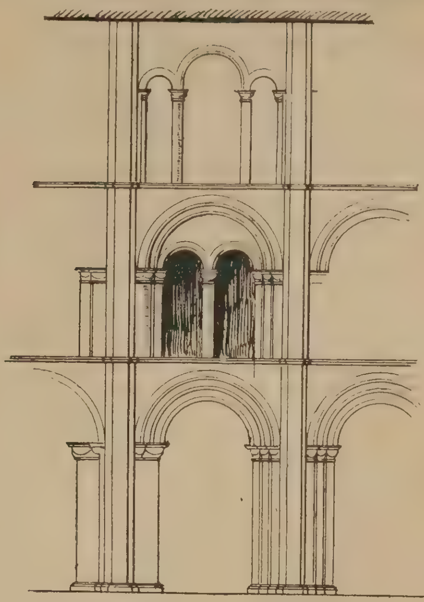
The left wing is treated differently, having on the ground stage a treatment of two two-light windows separated by a single light. Above this is a graceful oriel window.

The works of R. W. Edis are very numerous and varied. From a long list may be selected: The Constitutional Club; much work at Sandringham; Hotel Great Central; Cheveley, near Newmarket, &c.

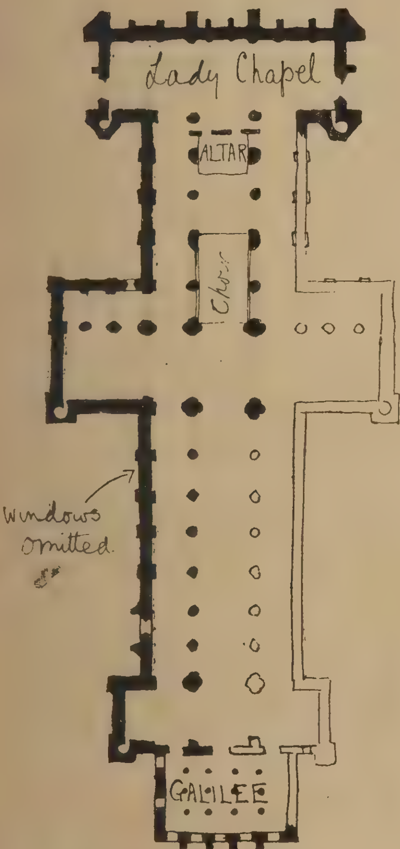
The Constitutional Club is built upon a triangular site with its principal elevation to Northumberland Avenue. The facing is entirely of terra-cotta—red and white. The front is divided into five bays, of which the second and fourth are slightly projected, the ground, first and second floors of these two being enriched with terra-cotta columns, with the lower parts of each column ornamented with delicate low relief. These two chief bays are treated somewhat differently from each other, one being designed as the entrance, and



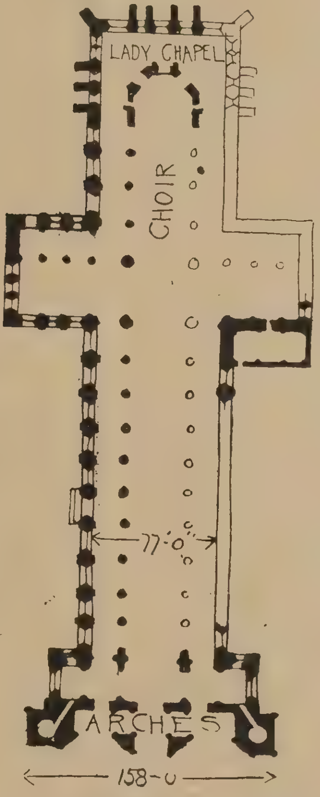
PLAN OF ELY CATHEDRAL.



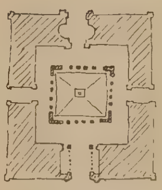
ELY CATHEDRAL: ONE BAY OF NAVE.



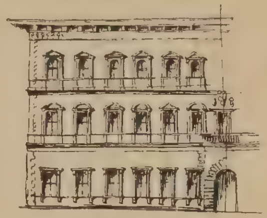
PLAN OF DURHAM CATHEDRAL.



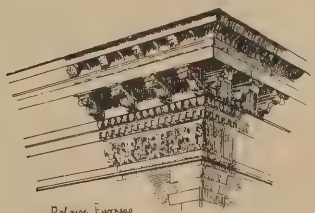
PLAN OF PETERBOROUGH CATHEDRAL.



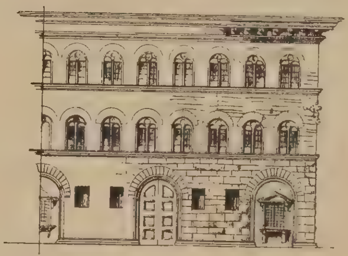
Palazzo Farnese
Sketch Plan



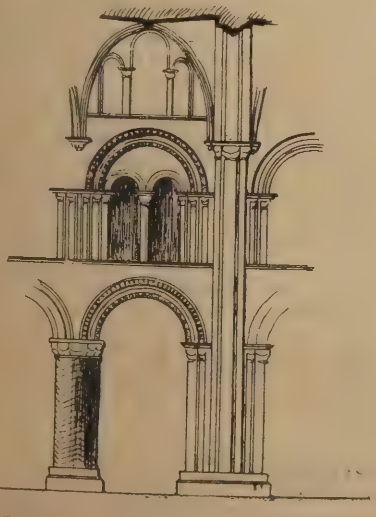
Rough Elevation
Palazzo Farnese



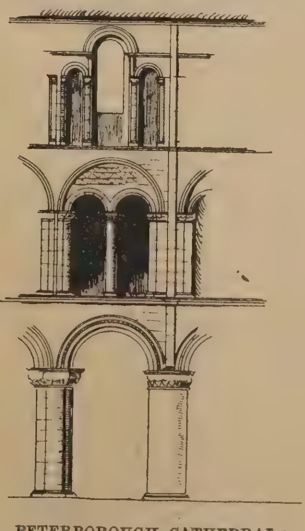
Palazzo Farnese
Angle of Cornice



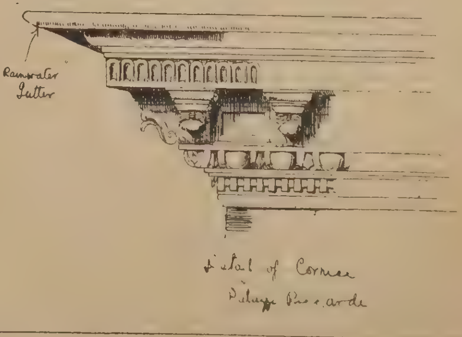
Sketch half elevation of
Palazzo Riccardi



DURHAM CATHEDRAL: ONE BAY OF NAVE.



PETERBOROUGH CATHEDRAL: ONE BAY OF NAVE.



Detail of Cornice
Palazzo Riccardi

ILLUSTRATING ANSWERS TO QUESTIONS 5 AND 6.

the other being slightly curved as a bow window. Each of the five bays is crowned by a gable of double contraflexed curves.

The Hotel Great Central, one of the most recent of Mr. Edis's works, has little in it to show that it is from the same hand as the above. Terra-cotta is used only for the features and enrichments, the main building material being red brick. The main façade is divided into five portions, the centre and two side compartments being projected forward into "pavilions."

The great entrance (in the centre of the main "pavilion") is faced entirely with buff terra-cotta and spanned by a bold arch, flanked on each side by a lesser one, the space above these latter being ornamented with graceful colonnades with windows behind. Above this great arch is a covered balcony, the main wall being carried on three well-proportioned bays of arcading, executed in buff terra-cotta. Above this again the "pavilion" is sub-divided into three vertical portions, the central one being an ordinary bay with splayed sides, dying away at the top of the building into a square clock tower, with circular turrets at each angle. The other two sub-divisions are treated as square bays, breaking (in the top storey) into octagonal form, and crowned by steep-pointed roofs. The end "pavilions" have, on the ground floor, spacious balconies, very much like that described above in the central block. Above these, each block is sub-divided into two vertical portions, each being a bay with splayed sides, dying back, at the roof line, into gables. The two intermediate portions are treated as simply as is consistent with the building.

(To be continued.)

Keystones.

Openings of New Synagogues.—The new Peace and Tranquility Synagogue in Buckle Street, Whitechapel, was consecrated on Tuesday, last week. The new Hambro Synagogue in Union Street, Commercial Road, E., which has cost nearly £4,000, was consecrated on Sunday week by the Chief Rabbi.

A Memorial Window at Holton Church, erected in memory of the late rector, the Rev. R. S. Beloe, was dedicated by the Bishop of Ipswich recently. The work has been carried out by Mr. Kempe, and the window contains three figures of Our Lord, the Virgin Mary and St. Peter, and an inscription to the late rector's memory.

New Bank Premises at Arbroath.—A property of three storeys, consisting of shops and dwelling houses, at the corner of High Street and Hill Street, has been purchased by ex-Bailie Scott at the upset price of £1,100. It is intended to erect on the site of the property new offices for Messrs. Miln and Dalgarno, solicitors, of Arbroath, in conjunction with branch premises for the North of Scotland Bank.

New Board Schools at Ocker Hill.—The ceremony of laying the memorial stone of the new Board Schools at Ocker Hill was performed on Monday, last week. The school will be capable of accommodating 650 scholars. It is being erected by Messrs. Whittaker and Co., of Dudley, from the plans by Mr. Alfred Long, architect to the Board, the style of architecture being Classic, freely treated. There will be a large tar-paved playground and a caretaker's house. The total cost of the undertaking will be between £6,000 and £7,000.

A New Mission Church at Oldbury.—The Bishop of Lichfield dedicated the Church of the Good Shepherd at Church Bridge, in the parish of Langley, last Monday week. The church is a plain but substantial building of brick, the materials having been given chiefly by Messrs. Wood and Ivery, while several other brickmasters gave 5,000 bricks each. It will accommodate 320 persons, and the cost, including the site, is about £2,500. New day and Sunday schools are also being erected in connection with the church.

Bricks and Mortar.

Aphorism for the Week.

"The painter should grind his own colours; the architect work in the mason's yard with his men; the master-manufacturer be himself a more skilful operator than any man in his mills; and the distinction between one man and another be only in experience and skill, and the authority and wealth which these must naturally and justly obtain."—John Ruskin.

The A. A. Programme. We have received a pamphlet from the Architectural Association giving particulars of the curriculum for the session 1899-1900. For the ordinary meetings which are held fortnightly at 9, Conduit Street, a capital list of papers has been arranged. The first meeting, when the President, Mr. G. H. Fellowes Prynne, will deliver his address and the prizes will be distributed, is fixed for October 6th. These large gatherings, however, constitute only a small portion of the Association's work. A number of educational classes are held which afford the architectural student an opportunity for obtaining a thorough mastery of his profession. In connection with these classes a number of prizes are offered. The discussion section—an interesting and useful feature of the Association's work—begins its session on October 13th, with a debate on "The Registration of Architects." On Saturday afternoons in the spring and summer, visits are paid to buildings of architectural interest. We would strongly urge any of our younger architectural readers who are not already members of the Association to write for particulars as to conditions of membership, &c., to the secretary of the Association, at 56, Great Marlborough Street, London, W.

A Roman Camp Discovered. It is reported that excavations on the right bank of the Narenta, in Herzegovina, near Capljina, have resulted in the discovery of an exceedingly well preserved and extensive Roman camp, which archæologists say must have been erected during the reign of Nero (A.D. 54 to 68), and existed till about the time of the Emperor Theodosius, who died A.D. 395; the camp was evidently destroyed by fire, as is proved by the presence of numerous pieces of charcoal and other unmistakable signs of conflagration. As far as can be seen at present, the camp is a hundred mètres long and eighty broad. Most of the walls and arched passages can still be traced. The outer wall has three gates, one of which is two stories high. The steps in the towers are extremely well preserved. The floor and part of the decorations are still in good condition. Many utensils and weapons have been dug up, which afford interesting information concerning the mode of life in the camp.

Old City Conduits. At some time or other most of our readers have seen specimens of the old wooden water conduits, and, perhaps, have thought that at no period was the water supply so pure as when carried to the consumer through these crude appliances. Every now and then workmen come across them while excavating. The workmen who are employed by the National Telephone Company in the work of excavating at the corner of Goswell Road and Old Street, recently discovered some crude cylinders of timber, apparently hollowed-out trees, which had been used for the purpose of conduits. They were found within a few inches of the paving stones. There is nothing to show their exact age; they are in a remarkable state of preservation, and consist of small trunks of elm and hornbeam, tapered at one end in order that they may be easily fitted into another "pipe." They were probably used for supplying London with spring water from the reservoirs at Sadler's Wells, Bagnigge Wells, and adjacent places. The course extends along the gutter way of Old Street. Originally, water was brought into London by these means and carried to public cisterns. Wooden conduits were used before lead ones were introduced, and the records show that in the year 1236, King Henry III. for the "profit of the citie and good of the whole realm . . . granted to the citizens and their successors liberty to convey water from the town of Tybourne by pipes of lead into the City."

St. Mary-le-Bow. A representative of the "City Press" has been interviewing Mr. Churchwarden Thompson on the state of the Church of St. Mary-le-Bow, in Cheapside. Mr. Thompson said that Sir Douglas Fox has fixed "fillets" on the steeple with a view to discovering how far it is out of the perpendicular. Our contemporary quotes some interesting observations, written by Mr. T. Lott, in 1844, on the results of an investigation made by him of several vaults in the vicinity of St. Mary-le-Bow. He says: "Having occasion to inspect several of the houses on the west side of Bow Churchyard, the property of the parish, I am surprised on descending into the cellars to find (as the foundation of three of the houses) stone vaultings of very substantial masonry. On a subsequent visit we found beneath the house No. 5, occupied by Messrs. Groucock, a square vaulted chamber, 12ft. by 7ft. 3in. in height, with a slightly pointed arch of ribbed masonry, similar to some of those of the old London Bridge. We were informed that there had been in the centre of the floor an excavation, which appeared formerly to have been used as a bath, but which was now arched over and converted into a cesspool. Proceeding northwards towards Cheapside we found what appeared to be a continuation of the vault beneath the houses Nos. 4 and 3. The arch of the vault here is plain, not ribbed, and more pointed. The masonry appears, from an aperture made to the warehouse above, to be of considerable thickness. This vault or crypt is 7ft. in height from the floor to the crown of the arch, and is 9ft. in width and 18ft long."

Vaults. The writer continues: "Beneath the house No. 4 is an outer vault. The entrance to both these vaults is by a depressed Tudor arch with plain spandrels, 6ft. high, the thickness of the walls about 4ft. In the thickness of the eastern wall, in the vault of the house No. 3, are cut triangular-headed niches, similar to those in which in ancient ecclesiastical edifices the basins containing the holy water, and sometimes lamps, were placed, instances of which are seen in old Stepney Church, and many other buildings of the same period. In some other parts of these vaults are modern imitations of these recesses. The vaulting beneath the house No. 2 appears to have been destroyed to add convenience to the warehouses, but the buildings, of which these are the vestiges, appear to have extended to Cheapside, for beneath a house in Cheapside, in a direct line with these buildings and close to the street, is a massive stone wall. The arches of this crypt are of the low pointed form which came into use in the sixteenth century. There are no records extant of any monastery having formerly existed upon this spot, and these remains are of a ruder and more massive character than those still existing beneath a house in Leadenhall Street and Gerard's Hall, and those which were discovered in the year 1825, in excavating to form foundations for new houses in Watling Street, all of which are of a far more ornamented and pleasing character than those I am describing, which resemble, more than anything I have seen, a crypt beneath that part of St. Augustine's monastery at Canterbury, which is now a public-house, and to which it forms a wine cellar."

Swarkestone Bridge. The manner in which the preservation of the Gothic arches of Swarkestone Bridge, Derbyshire, has been carried out by the county council will certainly not meet with the approval of lovers of architectural congruity. As Mr. W. Smithard says in a letter to the

"Times" on the subject, the work has been apparently undertaken without any regard for the remarkable character of the structure, as no one having the slightest admiration for Gothic would think of visibly bolstering it up with common blue bricks. If for the sake of cheapness it were unfortunately necessary to use material so incongruous, surely a facing of stone at least should have been provided; but here the blue bricks have been used in such profusion that the new arches look strong enough to carry a railway train, in striking contrast to the original work, which well exemplifies the economy that mediæval builders exercised in material, making up for it in workmanship that has stood the test of nearly 600 years. Two councillors and a surveyor after visiting the spot recommended another scheme whereby the old arches would have remained intact. This was dropped because it was "impracticable," although it would only have involved slightly raising the road. The restoration of a Gothic church is a matter which is not usually left entirely to local architects, but a specialist is employed. A Gothic bridge is in some respects more valuable than a Gothic church, for it is much rarer; therefore, the opinion of an expert should be taken in this case without further delay.

A Roman Pavement at Dorchester. WHILE some workmen were excavating a portion of "Fordington Field," which has been set apart for building purposes, they came across a very fine specimen of a villa pavement. The site of the pavement is about 250yds. in a westerly direction from the ancient Roman amphitheatre which is near to the Roman road leading out of Dorchester to the coast. The pavement was found about 2ft. below the surface, and is about 30ft. long and nearly as wide. The design is unusually elaborate, and consists of red, black, and white tessaræ, forming an octagonal centre, ornamented with guilloches, scrolls, &c., flanked by two oblong designs, each having for its centre a vase of about 2ft. long, of excellent shape, with scroll handles. The fact that the position of the site is about 250yds. south of the union workhouse and just under 150yds. west of the Great Western Railway cutting is remarkable, as very few Roman remains have been found outside the walls of Durnovaria on this side, excepting the amphitheatre.

Dundee Art Galleries. IT was some time ago deemed advisable by the Dundee Town Council to thoroughly renovate the Art Galleries. The improvements have now been carried out. The ceiling of the Great Gallery has been done up in old gold, and the walls have been painted a rich maroon colour. The doors and woodwork of the various galleries have been re-stained and varnished. The entrance hall, staircase and corridors have been decorated in an artistic manner, and have been very much improved by statues which have been placed amongst many flowering plants. As there is no Fine Art Exhibition in the Victoria Galleries at this time, the pictures have been borrowed from collectors, and these line the walls on all sides. A number of artists, both local and at a distance, also readily sent works, among the Dundee artists being Mr. Stewart Carmichæl, Mr. J. G. H. Spindler, and Mr. Charles Phillips; while from Edinburgh the following have kindly sent pictures:—Mr. T. Graham, H.R.S.A., Mr. P. W. Adam, and other local gentlemen. Messrs. Doig, Wilson, and Wheatley, who have been the agents in Edinburgh of the Dundee Fine Art Exhibition ever since its institution thirty-two years ago, have lent nearly one hundred pictures.

Continental Fire Testing Station. THE St. Petersburg Pan-Russian Fire Protection Society, which has been organized on lines similar to those f the British Fire Prevention Committee, has decided to follow the London ociety's example of creating a Fire Testing tation; in fact, its president, Prince Alexander Levoff, has already presented the necessary site and building. The scheme for this station is the result of Mr. E. O. Sachs' visit to St. Petersburg last month, and its organization is part of his project for a series of stations in the continental capitals, to be worked on lines identical with those adopted in London, but whilst the foreign stations will attend solely to matters of local interest, the station at Regent's Park will deal with matters of international importance and serve as the centre. At St. Petersburg, for instance, attention will almost entirely have to be given to improved methods of construction in the villages where safer materials will have to take the place of thatch and matching, &c., a subject which would, of course, be of no moment elsewhere. The annual destruction of villages in Russia, it should be remembered, is very serious, and the national yearly fire loss, according to Mr. Sachs, is about seven millions sterling. Mr. Sachs expects that by a systematic organization of this kind, and a systematic international mode of procedure, with due regard to special local requirements, combined action in fire prevention will be arrived at on the same lines as we have international movements in sanitary and hygienic matters, which, though they have one recognized centre, yet allow independent treatment of purely local questions in the particular countries to which they refer.

Excavations at Melandra Castle, Glossop. FURTHER interesting discoveries are being made in the course of the excavations which are being actively carried out on the site of Melandra Castle, near Glossop. Excavations on the east side have led to the discovery of the old wall, and this has been traced for a considerable distance, and in some places found to be three courses thick. The Porta Principalis Dextera, or right-hand gateway, has likewise been unearthed, and found to be eight yards wide, the intervening roadway being composed of gravel cement. The excavators have also directed attention to other parts of the old Roman station. Various sections have been cut which have brought to light the foundations of a tower and a fireplace or oven. Recently Mr. John Garstang, B.A., of Oxford, who was in charge of the Ribchester excavations, visited the site, accompanied by other gentlemen. An inspection by Mr. Garstang of the work already accomplished led to the opinion that the site would prove to be one of the most interesting ones in the kingdom. Mr. Garstang has been engaged to supervise the excavations.

Albert Hall, Aberdeen. THIS hall, which is considerably used for supper and dance parties, lectures, public meetings, &c., has been very much improved in appearance during the last few weeks. The pitch pine dado round the hall has been revarnished, while the walls, for the first time, have been painted in oils. Above the dado now runs a pale green stencil band, sixteen inches deep, in which an effective floral ornament is brought out in agreeable colours. The surface of the walls has been painted in a rich deep ruby. Under the broad painted frieze is a pendant ornament, sufficient to ease off the colour of the main surface before touching the frieze, which is a conventional floral and figure design in soft and harmonious colours. The woodwork of the ceiling and hall has been re-varnished, and the arch-beams rise from corbels in the side walls, which, themselves treated in cream and gold, form a highly effective embellishment. The ante-rooms connected with the hall have been tastefully re-decorated, and the lobby and staircase have been similarly treated. The decorative work has been carried out by Mr. William Phillips, Huntly Street, Aberdeen.

A New Pavilion for the Sultan. FROM Constantinople comes the intelligence that the park of Yildiz swarms with builders just now. On its Ortakeui side they are pulling down the old boundary wall in order to extend it round adjacent lands lately purchased by the Sultan for annexation to his private domain. On the opposite side they are demolishing the wooden structure hastily run up as a refuge for his Majesty after the earthquakes of 1894. This clearance is preparatory to the erection on the same site of a new pavilion, which is to be the personal and exclusive habitation of the Sultan. Externally it will be an exact reproduction of the Grand Trianon, but its internal fittings will be far more elaborate and its decoration much richer. According to the plans, drawings, and specification, prepared by two French architects and adopted by the Sultan, the cost of the building will be 2,000,000f. A well-known Paris firm of upholsterers has been engaged to design and supply the furniture, which is to be exceptionally *recherché* and proportionately costly.

Sir E. Antrobus's right to Stonehenge. THE feeling throughout the country is strongly in favour of the government acquiring Stonehenge at a reasonable price for the nation. At a meeting of the Wilton Town Council last Wednesday it was decided to petition the government to acquire the ancient monuments, and the council are calling upon the county authorities and antiquarian societies to support the petition. At the meeting several of the councillors questioned whether Sir Edmund Antrobus has the power of selling the ground around Stonehenge, which has been open to the public from time immemorial. There are several roads and footpaths in close proximity to the monument, and the council were unanimous in their opinion that the right of the public to the use of those roads should be maintained. Stonehenge is a source of considerable revenue to Salisbury and district, and the prevailing opinion is that the monument should be acquired by the State.

Improving upon Marconi. IT is reported that encouraging experiments in wireless telegraphy, in which kites were used, have been made between Harvard College and Milton, Massachusetts. The distance was twelve miles, and there were considerable difficulties owing to the electric power-houses, electric trolleys, &c., on the route. In spite of this, however, telegrams passed at the rate of ten words a minute, and it is thought that complete success will be achieved when the disturbing elements have been overcome. The process employed was practically the same as Signor Marconi's, but wires hanging from the kites were substituted for poles. It is claimed that these have an advantage over poles, as being more easily adapted for any height or distance.

"The Most Artistic Country." LAST Monday's "Daily Chronicle" contained the following interesting paragragh:—"We hear so much in England of the superiority of other countries in the methods and results of technical instruction, that we are fairly entitled to any crumb of consolation which may be derived from foreign comments on our own achievements. It is, indeed, something more than a crumb of consolation to be told by competent judges in Vienna that England is now the most artistic country in Europe. It seems that last year the annual exhibition of students' work at South Kensington produced such an impression on one or two Austrian teachers who visited it that official application was made for a loan of some of the drawings and designs, whilst others were purchased at the close of the exhibition. These specimens were exhibited in Vienna, and they extorted the judgment which we have quoted." We should share our contemporary's elation if we had not just the faintest shadow of a suspicion that the "competent judges" in Vienna were merely paying a compliment that was not intended to be taken quite literally. We wonder what our French neighbours would say of this estimate of England as the most artistic country in Europe.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

ARCHITECTS' LIABILITY FOR DEFECTIVE WORK.

To the Editor of THE BUILDERS' JOURNAL.

BRISTOL.

DEAR SIR,—A small job of cement work—viz., the half round concrete coping of a burial ground boundary wall—was carried out from plan and specification prepared by us and under our superintendence.

We certified for the work in November last, and in the following two months we have had a lot of rain and frost alternately, with the result that the cement coping scaled and chipped. The sand and gravel used with the cement was not of as pure or good a quality as it should have been, and the cement used was Portland cement.

The Sanitary Authority says that we, having given the contractor a certificate for payment on which he was paid, are bound to remedy the defects at our own expense. They have nothing to say to the contractor or the cement manufacturers. Kindly let us know what you think of the matter, and oblige.—Yours faithfully, CEMENT.

I think that the architect is liable to his employers in damages, the measure of which will be the cost of remedying the defect, for having improperly given the certificate.

H. P. B.

HEATING A VINERY.

To the Editor of THE BUILDERS' JOURNAL.

GREAT YARMOUTH.

DEAR SIR,—I want to make a doorway into a vinery, but the hot water pipes, on the flow stand up 12in., and anyone coming through the proposed doorway would have to step over them, which would be very inconvenient. I cannot lower the whole of the pipes on account of the boiler. Would you tell me if I shall get the heat to flow round the house if I insert swan's necks on the flow reducing the flow 12in. for 3ft., the width of the proposed doorway, and raising it again to the same height. Should I get the hot water to run down hill and up again?—Yours, &c.,

F. J. H.

We would suggest that the pipe should be carried over doorway, not necessarily the same size, a 2in. pipe would do, with an air tap on top, and the cistern raised to a point above the air tap, so as to ensure the pipe over the doorway being filled with water. J. AND A.

CLASSES IN QUANTITIES.

To the Editor of THE BUILDERS' JOURNAL.

NEW BROMPTON.

DEAR SIR,—I should feel obliged if you would inform me whether you know of a class being held on Saturday evenings during the coming terms in quantities.

Stationed where I am, I find it rather awkward to get away on any other evening.—Yours faithfully, S. J.

We do not know of any class meeting on Saturday evening; possibly some of our readers can give the required information.

PUTTING PLANS ON PARCHMENT.

To the Editor of THE BUILDERS' JOURNAL.

BRIGHTON.

SIR,—I shall be very glad if you will give me an answer to the following question. I have a number of plans to put on parchment, many of them requiring large washes of colour. I presume that nothing is better than pounce to overcome the *ordinary* difficulties of colouring on the parchment. But it seems necessary to mount the skins, and the preliminary damping of the back has resulted in an immense number of dark greasy-looking spots of various sizes, and these do not dry out. Is the parchment defective, or do these spots generally appear on damping? I do not remember them on previous use of parchment. They practically *cover* most of the surface. I have tried sizing, but with questionable results, and should be glad of advice on the whole operation.—Yours, &c., A. B.P.

Our correspondent's difficulties are in all probability caused by the parchment used, through it not having been properly cured, and being therefore defective, as he suggests. It might, however, be worth his while to repeat the sizing and see if it is more successful. If he has only sized it once, that might be insufficient. We cannot suggest any other remedy. Our correspondent is quite right in using pounce for the purpose he refers to.

H. B. W.

SKELTON CHURCH, YORKSHIRE.

To the Editor of THE BUILDERS' JOURNAL.

MANCHESTER.

SIR,—I wish to make a drawing of the doorway of Skelton Church, Yorkshire, but am unable to go there to measure it. Could you tell me whether it is sufficiently illustrated anywhere? If so, in what book?—Yours, &c.,

ENQUIRER.

Measured drawings of Skelton Church appeared in our issue for April 28th, 1896. Mr. Harold E. Henderson, of 12, Ridge Road, Armley, Leeds, has kindly offered to send "Enquirer" a tracing of the porch which he made in 1897, if our correspondent will communicate with him.

PREVENTION OF VIBRATION.

To the Editor of THE BUILDERS' JOURNAL.

EASTLEIGH.

SIR,—Will you kindly inform me through your valuable journal what I could do to prevent vibration caused by traction engines passing close to my house.—Yours, &c.,

H. H.

H. H. does not give us sufficient data to work upon. It would be necessary for us to know something of the construction and arrangement of his house, before we could definitely assist him. However, we fear he must put up with the vibration, as nothing he could do could materially lessen it. It is obviously impossible to prevent the vibration of the ground communicating itself to the foundations, thence to each floor, and thence to each article of furniture. R. W. C.

BUILDINGS FOR INEBRIATES.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, E.C.

Sir,—Can you kindly refer me to any buildings of recent date which have been erected for the reception of inebriates of both sexes, or inform me where I can obtain any particulars as to the arrangements and planning of such institutions.—Yours, &c.,

ASSISTANT.

We do not know whether "Assistant" requires information about private nursing homes for inebriates or public asylums. We cannot recommend any one book which deals with the whole of this large subject, but would advise "Assistant" to turn up the files of the building papers so as to obtain information about those erected under the Metropolitan Asylums Board. R. W. C.

COLOURS IN WORKING DRAWINGS.

To the Editor of THE BUILDERS' JOURNAL.

IPSWICH.

SIR,—Will you kindly give me an index of colours used in colouring working drawings, representing the various materials used?—Yours, &c. N. A.

The systems employed in colouring working drawings are very varied, but in the following list the first mentioned colour is the most usual for each material.

Brick.—Light red, Venetian red, sometimes crimson lake (to be avoided).

Stone.—In elevation, left white or a light tint of mauve; in section, indigo, sepia, or brown.

Wood. — (Wrot.), brown; (unwrot.), b sienna. Sometimes burnt sienna is for both, or even yellow ochre.

Iron and Steel.—Prussian blue.

Concrete, Asphalte, Cement. — Payne's g neutral tint, &c., interchangeable used to much confusion.

Plaster.—Purple.

Slate.—Sage green.

Tiles.—Bright red (distinguishable from o reds used). R. W.

PARTY WALLS.

To the Editor of THE BUILDERS' JOURNA

LANCASHIRE.

SIR,—Will you kindly inform me what law is in connection with party walls?

Can the adjoining owner cover the f face of a 14in. party wall with his s pilaster to his shop front; or, can we f him to keep it to his side of the *centre* of said party wall?

I was always under the impression each owner was by law compelled to finis mouldings or other features at the ce of a party wall, and not allowed to tres beyond.—Yours, &c.,

MANCHESTER MA

The adjoining owner cannot cover the f face of the party wall with his pilaster.

H. P.

Correspondence.

NOTE BOOKS FOR ARCHITEC

To the Editor of THE BUILDERS' JOURN

WINCHFIELD.

DEAR SIR,—I am sure many will have g reason to thank you for the valuable interesting article, in your issue for Au 23rd, on the subject of note books and dia Having been in the habit of keeping a d and taking notes for many years, it may b some help to others if I draw attention to important matter. It is essential that may be able to find a note quickly. Thi not always easy, especially if the note made some years ago. Hence some simple unfailing system of indexing is of the utr importance. In my own experience I kno no system better than that adopted in " Student's Cabinet Note Books," brought some time ago by Messrs. Eason and Son, 80, Mid Abbey Street, Dublin.

I have no doubt many others besides my can thankfully testify to their usefulnes other ways as well as for note books.—Y faithfully, H. TOWNLEY SUGDE

TO OUR READERS.

THE discussion which has lately taken p in our columns relative to the Registra of Architects has aroused very great inte and has elicited expressions of opinion f many of the most eminent men in the pro sion. We wish to notify to our rea generally, and especially to architects p tising in the provinces, that our columns open to the discussion of other question equal professional interest. Short article open letters on any subjects that are of gen interest to architects and builders will rec careful consideration, and those used wil paid for.

We issue this general invitation to readers with a view to making the BUILD JOURNAL AND ARCHITECTURAL RECORD more widely representative of the interest the architectural profession than it is present. Our aim is to make the journal and more conform to the character of a fessional journal, written by professional for professional men, and to that end we in the co-operation of all who have any sug tions to make that are likely to tend to advancement of the profession.

Keystones.

The Martyrs' Memorial at Smithfield is to be unveiled on Saturday, the 30th inst.; it has just been cleaned and restored.

New Mixed Schools in Branch Road, Hertford, are being erected from plans by Mr. F. Waller, of London, at a cost of over £1,500. Messrs. Boff Bros. are carrying out the contract for the work.

Messrs. Parker's Joinery and Cabinet Co., Ltd., have been compelled, owing to increase of business, to remove to more extensive works and warehouses at 30, Wharf Road, City Road, N.

New Organ for Adlington.—A new organ, built by Messrs. Richardson and Sons, of Manchester, for the Congregational Church at Adlington, near Chorley, was opened last Wednesday evening.

A New Conservative Club at Keighley.—The foundation stones of a new Conservative Club were laid by Mr. Walter Bairstow, of Ripon, and Mr. Thomas Ecroyd, of Keighley, recently. The new premises are to cost about £1,500.

The New Bridge at Boat of Garten was opened by the Dowager Lady Scafield recently. The bridge, which has been erected by Mr. Charles Mackay, contractor, of Inverness, at a cost of £1,500, is of timber, with well-built stone abutments.

Proposed Theatre at Stockport.—The Stockport Watch Committee has refused to grant a full dramatic licence for a new theatre proposed to be erected in St. Peter's Gate at a cost of more than £20,000, and it is understood that the place will not now be proceeded with.

New Dock at Port Talbot.—The new graving dock at Port Talbot, constructed by the Port Talbot Dry Dock and Shipbuilding Company, was opened last week by Mrs. Mordey, of Newport. The dock is 835ft. long, 60ft. entrance and 110ft. wide. Its area is six acres. Alongside the dock are large engineering shops, and it is intended to proceed with the construction of vessels forthwith.

The Smoke Nuisance in Bradford.—At the Bradford City Police Court on Tuesday, last week, before the Stipendiary Magistrate (Mr. Skidmore), Smith Bros. and Eastwood, Valley Road; Ayrton and Co., Shearbridge Street; Thomas L. Lupton, Filey Street; and the Bradford Coffee Tavern Co., Limited, Peel Street, were each fined 10s. and costs for emitting dense smoke from their respective chimneys in such quantities as to cause a nuisance. An order for the abatement of the nuisance was made in each case. The proceedings were taken by Mr. Slater Nicholson, smoke nuisance inspector.

Proposed New Infirmary at Newcastle-on-Tyne.—Mr. J. C. Eno, of Dulwich, who was formerly a chemist and druggist in Newcastle, and has since traded in London, has sent to Mr. Riley Lord, of Newcastle, a cheque for £8,500, the amount required to bring up the Queen's Jubilee Commemoration Fund (which is designed to found a new infirmary) to £100,000. Another sum of £100,000 was bequeathed to the same purpose recently by the late Mr. John Hall, a Newcastle merchant, on condition that the jubilee fund should be raised to the same sum and collected within three years.

Barnsley Police Accommodation.—Col. A. G. Durnford held a Local Government Board inquiry on Tuesday last week, into an application of the Town Council for permission to borrow £1,752 for the erection of police buildings and a court house. By gutting the lower storey of the present town hall premises and the police quarters adjoining, it is proposed to provide charge-room, clerks' offices, and parade-room of ample dimensions, and to provide four cells, fitted in the latest approved manner. It was stated incidentally that the Council would shortly come forward with a scheme for treatment of the sewage of the town bacteriologically.

The Birmingham Royal Society of Artists opened its seventy-third annual exhibition to the public on Monday.

The Decoration of the "Oceanic."—The decoration of the principal apartments and staircase of the White Star liner "Oceanic" was entrusted to Mr. R. Norman Shaw, R.A.

The Royal Duchess Theatre at Balham, of which Mr. W. G. R. Sprague is the architect, is nearly completed, and it is estimated that its cost will be about £35,000.

The Annual Exhibition of the Sheffield Society of Artists was opened on Friday. The collection of pictures is smaller this year than last, being only 176 as against 330.

The Walker Art Gallery, Liverpool.—The autumn exhibition was opened on Monday. One of the most prominent pictures is Sir Edward Burne-Jones' "Arthur in Avalon."

Proposed Hospital at East Ham.—Mr. Passmore Edwards has offered to give the sum of £4,000 for the erection of a hospital at the corner of Shrewsbury Road, East Ham.

New Schools at Burtonwood, Lancs., have been erected at a cost of about £2,000. Mr. Thomas Beesley, of Warrington, is the architect and Mr. James Pilkington, of Ramford, is the builder.

A Stained-Glass Window at St. Peter's Church, Newbold, was dedicated recently. The window is by Messrs. Comere and J. Capponnier, of Brussels, and illustrates the subject of "The Widow's Mite."

Subsidence in the City.—On Friday, the roadway in Cannon Street, close to St. Paul's Cathedral, to the extent of twelve yards, suddenly gave in from the centre, causing the remainder for some distance around to warp and buckle up.

Fire at a Paris Electric Works.—A serious fire broke out on Wednesday evening in some large electrical works at La Chapelle Triage, by which La Chapelle and St. Denis railway stations are supplied. Damage was done to the extent of 100,000 francs.

A New Baptist Chapel at Maesteg, Glamorganshire, was recently opened. It is built of local stone, with Forest of Dean dressings. The roofing is of copper-coloured Carnarvon slates. The cost was about £1,400. Mr. W. W. Williams, of Blaengarw, is the architect and Mr. D. J. Davies, of Swansea, is the contractor

The Highest Monument in the World is the statue of the Virgin—the Madonna of the Snow, as it is called—which is on the very top of Rocciamelone. It is cast in bronze, and weighs about 1,500lbs. It was cast in eight pieces, and there being no road on the mountain, but only paths and gullies formed by running water, the different parts were carried by forty Alpine soldiers and twenty sappers.

Accident at a Foundry.—A mishap occurred on Wednesday afternoon at the Scotch Foundry, Manchester, belonging to Messrs. Fletcher, Russell and Co., by which thirteen men and boys employed there were burned by molten metal. The tube connecting the cupola and the receiver had got clogged, and while the obstruction was being removed the persons injured had gathered round, in spite of warnings of the danger, to watch the process. They received on their heads and the upper parts of their bodies the spurts and jets of melted pig-iron. Most of the sufferers, after being taken to a hospital, were able to go home, but three were detained as in-patients.

A Hospital at the Nile Dam Works at Assouan has been erected by Messrs. Aird and Co., for the treatment of any of the workmen engaged on the great undertaking who may meet with an accident or be stricken by disease. Messrs. Aird and Co. report that 198 patients have been treated since October, 1898, when the hospital was opened. The buildings seem to have been admirably planned, and there are distributed about the works eight hospital stations in convenient positions. The cost of the hospital buildings and the dwelling-houses connected therewith has been approximately £4,300, and the annual charges, including the expenditure on the sanitary department, amounts to nearly £3,500.

New Infantry Barracks at Pembroke Dock are to be erected at a cost of £90,000.

Closure of Roads.—The Constitution Hill and the roads in St. James's Park, with the exception of the road from Storey's Gate to Buckingham Palace Gate, will be closed for repairs for about a month.

A Carved Oak Altar and Retable has been placed in the chancel of the parish church of Pagham, Sussex, and the sanctuary floor has been raised. The altar was designed by Mr. G. P. Allen, architect, of London, and was built by Mr. Foster, of Bedford.

Extension of Preston Police Station.—The plans of the extensions to the police-court were passed on Wednesday by the Town Council, and application is to be made to the Local Government Board for sanction to borrow £7,000 for carrying out the work.

Proposed Improvement of Scarborough Harbour.—The Scarborough Harbour Commissioners have decided to carry out a scheme for the widening and extension of the West Pier at a cost of £10,000, and the committee have been authorised to obtain the necessary loan and tenders for the work.

A Stained Glass Window has been erected in St. Clement's Church, Greenheys, Manchester, in memory of Mr. Jackson, who was for many years a warden. The artists of the window which has for its subject, "The Good Samaritan," are Messrs Wailes and Strang, of Newcastle-on-Tyne.

A New Wesleyan Chapel at Portbury is to be erected at a cost of about £300. A number of memorial bricks were laid on Wednesday. The new building is to be of plain red brick and will measure about 31ft. by 20ft. with a vestry. It will seat about eighty persons. The plans were by Mr. J. Young, of Bristol.

A Tower has been added to Walton Church, of which Messrs. Brown and Burgess, of Ipswich, are the architects, and Mr. H. J. Linzell, of Ipswich and Felixstowe, is the builder. The tower is Perpendicular in style, and is faced with split Bramford flints, with Portland stone dressings. It is built upon the foundations of a former church, and inside there is a circular staircase leading to the belfry. The new porch is paved with York stone and tile.

Fall of a Crane at Cement Works.—As a crane was being employed to lower cement and bring up slates, on Thursday, at the cement works of Messrs. Bright and Sons the arm snapped off at its base, and the crane, with cement bags and slates, fell on the van, horses, and men below. One of the horses was killed instantly, and three men—William Prettyman, John Jevons, and Manuel Willox—were so severely injured as to necessitate their removal to a neighbouring surgery, where they were treated.

Newcastle Improvements.—At a meeting of the Newcastle Town Improvement Committee, the report for the widening of Byker Bridge was adopted, and it is to be presented to the Council for approval. The road for vehicular traffic will be 40ft. wide, and there will be a footway on each side 10ft. wide. It was decided to proceed with the paving of Percy Street, from Blacket Street to St. Thomas's Street. Plans were submitted for a proposed block of buildings at the top of New Bridge Street, but as they did not meet the requirements of the committee, they were not passed.

Rolling Stock Contracts.—It has been announced in Birmingham that large contracts for rolling stock for the Indian State Railways have just been placed with the Birmingham and Midland Waggon Companies, and that corresponding orders for iron and steel have been divided between South Staffordshire, South Yorkshire, and Scotland. About 5,000 tons of iron alone have been ordered from Staffordshire firms. The representative of one of the leading British railways states that his company is immediately tendering for 10,000 tons of materials for rolling stock equipment, and that the heavy English lines are preparing for an exceptionally large winter traffic.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work. An asterisk (* signifies accepted

BIDDULPH.—For the execution of water supply works, for the Urban District Council. Mr. C. R. Hall, engineer, 1, West-street, Congleton. Quantities by the engineer:—

W. Lawton	£3,651	2	7	J. and S. Beech	£3,265	0	0
Williams and Co.	3,622	5	8	C. J. Nevitt, Stafford*	3,132	10	0
F. Barke	3,276	0	0	H. Shardlow	3,077	2	0
W. Lovatt	3,275	0	0				
C. W. Machin	3,298	0	0				

[Engineer's estimate, £3,221 18s. 5d.]

BRIDLINGTON QUAY.—For the erection of three double-fronted houses, Horsforth-avenue, for Mr. F. Lowson. Mr. J. Earnshaw, architect, Carlton House, Bridlington Quay:—

E. Corner	£1,882	10	0	E. Wilson	£1,695	12	0
Blackman and Son	1,856	0	0	Smallwood and Shaw	1,680	11	6
T. Weldon	1,806	16	3	E. E. Yeomans	1,505	0	0
T. Spink	1,798	0	0	W. Barnes	1,500	0	0
T. Atkin	1,784	10	0	T. Blackburn	1,495	0	0
A. Gardam	1,711	0	0	J. Rennard*	1,195	10	0

[All of Bridlington Quay].

BRUTON.—For erecting girls' school, Mr. A. J. Pictor, architect, Bruton:—

S. Dodimead	£3,735	0	0	Clarke & Sons	£3,210	0	0
Long and Sons	3,638	0	0	J. & L. Francis	3,200	0	0
H. W. Pollard	3,460	0	0	T. Hobbs, Bruton*	3,041	3	4
Merrick & Sons	3,250	0	0				
T. Lydford	3,219	0	0				

BURNTISLAND (N.B.)—Accepted for the erection of school buildings for the School Board. Mr. Robert Little, architect, 4, St. Brycedale-avenue, Kirkcaldy:—

Masonry.—J. Jackson and Son, Burntisland	£2,525	16	6
Joinery.—D. Simpson, Kirkcaldy	1,299	11	4
Plumbing.—A. Rolland and Son, Dumfermline	283	14	6
Slating.—J. Storrier, Newport, Fife	120	0	0
Plastering.—W. Anderson, Burntisland	165	2	0
Ironwork.—Gibson and Son, West Fountainbridge, Edinburgh	153	16	0
Heating.—Meikle and Philp, Torphichen-street, Edinburgh	225	0	0
Painting.—A. Dick, Burntisland	52	13	5

CARDIFF.—For the erection of new warehouse in Millicent-street, for Mr. John Isaac. Mr. Edgar G. C. Down, A.R.I.B.A., 31, High-street, Cardiff, architect. Quantities by architect:—

Williams & Hoare	£1,925	0	0	R. Haines	£1,810	0	0
J. Perkins	1,923	18	0	D. Thomas & Son	1,795	0	0
Blacker Bros.	1,888	0	0	Geo. Griffiths	1,764	17	0
Lattey and Co.	1,861	0	0	S. Shepton & Son*	1,734	10	0
W. Thomas & Co.	1,855	7	0	Rees and Thomas	1.679	0	0
Fred Cousins	1,848	19	10				

[All of Cardiff.]

CREWKERNE.—For the erection of a factory at Crewkerne, for Mr. J. H. Walter. Mr. Henry Hall, architect, 19, Doughty-street, W.C.:—

Quibell	£2,083	0	0	Lye and Sons, Crewkerne*	£1,773	17	6
Watts	2,078	0	0				
Munford	1,895	10	6				

EXETER.—For new shop front, and alterations to 197, High-street, Exeter, for Mr. J. Tulsford. Mr. R. M. Challice, architect:—

J. Balsom	£1,068	Westcott, Austin and White, Exeter*	£910
Stephens and Son, Ltd.	1,033	J. T. Ayres	740
L. Smale	1,033		
Ham and Passmore	1,025		

LEEDS.—For alterations to offices, Pearse's-buildings, for the Board of Overseers. Messrs. Bedford and Kitson, architects, Greek-street-chambers, Leeds. Quantities by the architects:—

Isaac Gould	£3,850	0	0	J. T. Wright	£3,650	0	0
Irwin and Co.	3,833	0	0	Wood and Son	3,699	6	6
Armitage and Hodgson	3,740	0	0	Myers and Son, Woodhouse-st., Leeds*	3,499	0	0
Nicholson and Sons	3,725	10	11				

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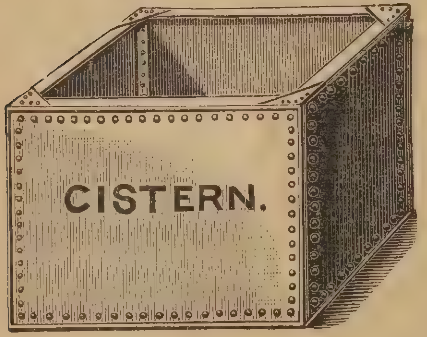

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LEEDS.—For levelling, metalling, &c., part of Old Park-road, Roundhay. Mr. E. J. Silcock, C.E., 10, Park-row, Leeds :—

J. Simpson	£3,562	Speight and Sons	£3,275
J. Ellis	3,511	J. Speight*	3,159

[All of Leeds.]

LEEDS.—Accepted for the erection of stables, &c., at Cavendish House, for Dr. S Rumbold. Mr. Fred Mitchell, architect, 9, Upper Fountain-street, Leeds :—

Brick and Stonework.—John Pickard *Joiner.*—Thos. Harrad *Plumber.*—J. E. Bedford *Slaters.*—Watson and Warsuop *Painters.*—W. Walsh and Sons *Stable Fittings.*—Thos. Green and Sons *Revolving Shutters.*—W. F. S. Holt, Bradford *Patent Glazing.*—W. H. Heywood and Co., Huddersfield	£634

[Rest of Leeds.]

LONDON.—For pulling down and rebuilding premises, No. 97, Bishopsgate-street Without, E.C. Messrs. Dale and Gadsdon, architects, 8, Union-court, Old Broad-street, E.C. :—

Gladding	£1,280	Sharpe and Sons*	£1,153
Symes	1,260	Pearman	1,055
Hoare and Sons	1,222		

LONDON.—For the superstructure of a new building in Throgmorton-street, City, to be used as a restaurant, shops, and offices, for Messrs. J. Lyons and Company, Limited. Mr. Charles Reilly, architect, 23, St. Swithin's-lane, E.C. Quantities by Messrs. Gardiner and Theobald, 110, Great Russell-street, W.C. :—

Hall, Beddall, & Co.	£43,900	Holland and Hannen	£41,950
Ashby and Horner	43,547	Mowlem and Co.	41,760
Trollope and Sons	42,666	Colls and Son	40,720
Forster and Dicksee	42,500	Patrick and Son	34,639

LONDON.—For the erection of shops and offices, Bishopsgate, E.C. Messrs. Dale and Gadsdon, architects, 8, Union-court, Old Broad-street, E.C. :—

Symes	£4,740	Sharpe and Sons	£4,590
Adamson and Sons	4,710	Williams	4,587
Hoare and Sons	4,670	Perry Bros.	4,557
Gladding	4,650		

MIDDLETON (Lancs.).—For the erection of chapel and schools, for the Wesleyan Chapel Trustees. Mr. Edgar Wood, architect, 78, Cross-street, Manchester :—

Bridge	£7,800	Grundy	£7,440
Robertson	7,697	Bullivant	6,889
Alderson	7,636	Jackson	6,850
R. Partington	7,594	J. Partington	6,800
Holland	7,536	Cable, Middleton*	6,645
Simpson	7,476		

LONDON.—For the erection of two dwelling houses and shops, Langhedge-road, Tottenham, N., for Messrs. Holt & Co. Mr. Fred. A. Ashton, architect, 177, Romford-road, Stratford, E. :—

J. & H. Cocks, Ltd.	£1,949	C. Chapman	£1,699

SENGHENITH (Wales).—For the erection of business premises, Commercial-square, for Messrs. Jones and Morgan. Mr. E. H. Bruton, architect, 15, Queen-street, Cardiff. Quantities by architect :—

Shops for Mr Jenkin Jones.

Thomas and Co.	£3,232 0 0	J. Lewis	£2,750
T. Evans	2,844 7 11	W. Ingleson	2,695
D. Thomas	2,836 0 0	J. Bowen	2,663

Additions to Hotel, Mr. Josiah Morgan.

J. Lewis	£1,245	D. Thomas	£974
T. Evans	986	W. Ingleson	843
Thomas and Co.	982	J. Bowen	779

STAMFORD.—For erecting new workhouse, for the Stamford Union. Mr. J. H. Morton, architect, South Shields :—

J. W. Rowe	£28,515	Lewin and Son	£23,995
Hockley and Son	26,710	Hinson Bros.	23,694
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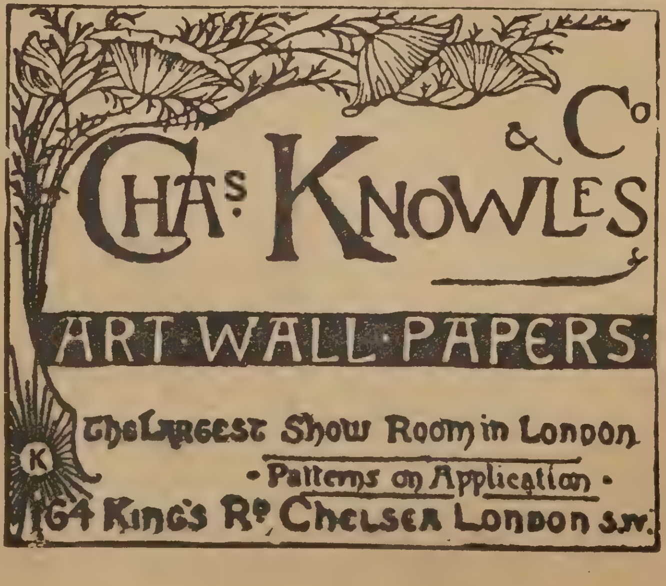

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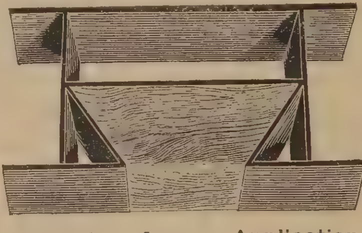

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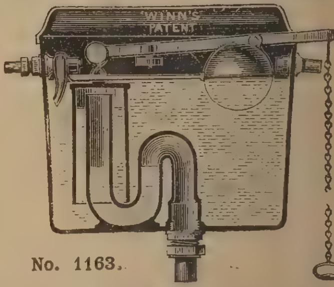

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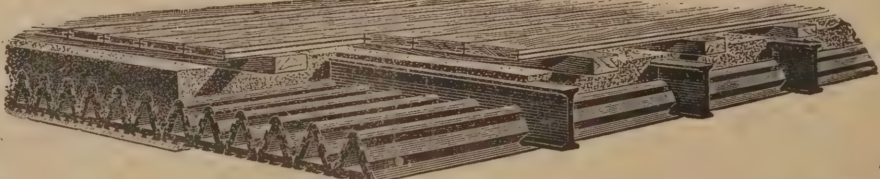

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THE SANITARY INSTITUTE.

CONGRESS AND HEALTH EXHIBITION.

[BY OUR SPECIAL CORRESPONDENT.]

THE eighteenth annual congress of the Sanitary Institute was opened on Tuesday, August 29th, at Southampton, under the presidency of Sir William H. Preece, K.C.B., F.R.S., President Inst.C.E., and if numbers be any criterion, must be considered one of the most successful yet held. It is estimated that from 1,800 to 2,000 attended from all parts of the United Kingdom, delegates representing Government Departments, County Councils, County Boroughs, Metropolitan sanitary authorities, Urban District Councils, Rural District Councils, Port Sanitary Authorities, School Boards, and a number of Medical, Scientific, Engineering, Architectural, and Building Societies, &c.

Everything that the Mayor and Corporation of Southampton, assisted by a powerful local committee, could do for the comfort and welfare of the visitors was done, and the only discordant note heard was from several delegates *re* the extortionate charges one of the hotels in the High Street tried to levy on visitors. It appears that the ordinary charge for bed and breakfast at this presumably respectable hostelry is but 6s. 6d., yet the landlord had the assurance to demand one guinea per night for a bed during the Congress week, and his other charges were in keeping. It is only fair to say that the Mayor and several members of the Corporation expressed their disgust and disapproval of the practice. It is actions such as these that are liable to give a bad impression to visitors, and to cause loss of custom to a town. The South-Western Hotel seemed to be patronised the most, and where everyone was loud in praise of the comfort and attention received, and the reasonableness of the tariff.

The Mayor formally welcomed the members and delegates to the Congress at a reception, which was largely attended, held in the large hall of the Hartley College. In the afternoon Sir William Preece, K.C.B., F.R S., gave his presidential address. He opened by saying that since their last congress they had lost one of their shining lights in Sir Douglas Galton, who was connected with the Institute from its commencement, and took a very active part in every branch of its work. The principal object of modern sanitary science was to discover the race and peculiarities of bacteria, and the chief function of the sanitary engineer was to defend the human frame from its invisible and insidious external foes. Protection from disease was the art of defence. They must know their enemy, detect his presence, defeat his movements, and destroy him as he would destroy them.

The Greatest Sanitary Engineer

the world had ever known was Moses. The Book of Leviticus was a treatise on hygiene. For 3400 years the world stood still, and only one race followed the doctrines and teachings of that great master. The Christian threw his tenets to the wind—the Mohammedan, to his great benefit, had continued to practise some of his principles to the present day. The Jew remained faithful, and was the healthiest and longest-lived type of humanity. The doctrines of Moses could be summed up in the objects of sanitation to-day, namely, pure air, pure water, pure food, pure soil, pure dwellings, and pure bodies. While research and discovery were abroad, whilst the practice and science of sanitation were in a state of transition, while bacteria were regarded by some as a passing phase of fashion, and by others as a great discovery come to stay, it was clear that they could not yet have reached finality. There were three very important principles underlying all the practical applications of sanitary engineering: (1) energy, or the ability to do work; (2) chemistry, or the power to transfigure matter; (3) life. The supply of pure air to those who breathed it was the object of ventilation, and the problem was to promote thorough circulation without imparting the feeling of draught, and without affecting the temperature or the humidity of the air. Thus the whole theory of ventilation was circulation of air maintained at a proper temperature, for cold air might be injurious. The British Legislature had taken care that lunatic asylums, hospitals, workhouses, and gaols should be well provided with proper air space per person, and should be supplied with effective means for ventilation; but churches, chapels, theatres, meeting halls, assembly rooms, railway carriages, &c., were totally neglected, and remained sinks of discomfort. People had a horror of draughts, windows were mercilessly kept closed. The minimum cubical space in feet for hospitals was 1000 and for factories 250. In a dining-room where he recently dined with four gas burners alight, by taking each gas burner as equivalent to five persons, the cubic space was 160 feet per head, and this air remained stagnant for two hours, and hence his head became an aching mass. In a third-class railway carriage, when full, it was only forty-seven cubic feet per passenger.

Electricity

had fortunately come in to simplify their difficulties. It had the great merit that in the glow lamp it did not vitiate the air. It supplied them also with a convenient form of energy to promote circulation either by forcing in the outer air, or by drawing out the foul air. It could even warm the air, and it could sift it from all material impurities before admission. Where the energy was cheap, it could be used not only for lighting, but for all mechanical purposes, and if it were properly utilised the span of life should certainly be extended beyond David's allotted period. The next necessity was pure water. Getting good water and maintaining it was the chief work of the sanitary engineer. But the maintenance of good water was the function of the authorities. Regular and active inspection must be maintained, and cheap and nasty fittings must be eschewed. Sir Edward Frankland found in Thames water one hundred thousand bacteria per cubic centimètre, and good drinking water should not contain more than twenty bacteria per cubic centimètre. Pollution had not yet been made a penal offence, and the Rivers Pollution Act of 1876 was inefficient to prevent pollution, and was in many places practically obsolete. He thought carefully purified

Water

was misused when applied to such purpose as the laying of dust, generating of steam, and flushing public sewers—processes which led to re pollution without any benefit whatever. To get a duplicate supply was well worth the consideration of the London County Council, for it would more than double the Metropolitan supply for domestic use. The Thames Valley ought to supply London with excellent water for the next fifty years, even with its present works. Five thousand tumblers of London water contained only one grain of solid matter, and the death-rate in the Metropolis, a good practical standard of the purity of the water, was well below the average. Valuable aid was rendered by electricity in securing the auxiliary supply of water, and impure water was completely sterilised by ozone, and ozone was easily, though not very cheaply, produced by electricity. The enormous importation of food into this country, rendered it imperative that strict and rigid inspection should be exercised upon its condition. The most important and the most general form of

Food

supplied was milk. The danger from milk was infinitely greater than from meat. It was unfortunately a great medium for the transmission of the germs of disease, especially of the bacillus of typhoid fever and of tuberculosis. Unclean milk was too common, and, unfortunately, inspection and examination of cows, cowsheds, dairies, and milk cans was in many cases thoroughly inefficient. It was not at present under the control of the proper sanitary authorities. Legislation as affecting adulteration of food, the importation of meat, and the sale of drugs, fruit, and fish was probably ample. It was the enforcement of regulations, the control of supervising powers, the appointment of inspectors that was weak; and that was to be remedied more by the publication of the proceedings of that Institute than by pressure from the central Government Departments, which too frequently was resented rather than encouraged. The big towns could and did take care of themselves, but the little towns and the scattered districts wanted educating and nursing. The system of treating and disposing of sewage could be considered under the three heads of mechanical, chemical, and biological. A distinction must be drawn between the requirements of great towns, villages, and hamlets and isolated houses. Every case must be dealt with on its own merits, as there was no one process equally applicable for every kind of sewage. Land treatment, either by itself or after the solids had been removed, formed, by the requirements of the Local Government Board, an essential feature of every scheme for

The Disposal of the Sewage

of an inland town. Unfortunately, as a rule, sewage farms did not pay, and it would be a great relief to get rid of them. It was impossible to recommend too highly the care with which the very able body of engineering inspectors attached to the Board examined schemes of sewage treatment and disposal, but there was unfortunately, a growing habit among local authorities to make material alterations in schemes after they had been sanctioned by the Board. That destroyed confidence, and in the end acted prejudicially on all concerned, and especially upon those eminent consulting engineers who were generally responsible for the work, and whose difficulties were very largely increased by local interference. Electricity had not played an unimportant part in assisting the sanitary engineer in his attacks upon sewage, though attempts had been made to assist the oxygenation of water by electrolysis. In regard to the sanitation of dwellings, people suffered not alone from ignorance, but from carelessness and filth. The lower the social scale and the greater the weakness of education, the more callous and indifferent human beings became to cleanliness and comfort and improvidence. The curse of drink, crime and vice were to be ameliorated only by education and by example. The legislation of recent years, by which local authorities could improve the dwellings of the working classes, and inspect and control common lodging houses, had exercised a beneficial influence upon the community, but, unfortunately, these authorities were much hampered by the restrictions of the Act of 1890, empowering them to improve the dwellings of the working classes, and they were checked by the greed of vested interests. The responsibility of

Maintaining Pure Dwellings

rested now very much with the sanitary authorities. The medical officer of health was a power. The examination of sanitary inspectors in London, thanks to the action of the Institute, was now compulsory under the Public Health (London) Act, 1891. It was not so in the provinces, but local authorities were becoming alive to its necessity, and they were requiring the possession of this certificate as one of the qualifications for appointment. The effects of rigid inspection and thorough application of the powers of legislation were shown by the fact that the death-rate in Surrey was 14, while in North Wales it was 20 per 1,000. 3,000 souls per annum ought not to die in North Wales if sanitary matters were duly looked after! Legislation, though often half-hearted, tended very much to increase the responsibilities of the local authorities. They were encouraged to acquire and conduct certain trading operations which affect the interests of the whole community, especially the supply of water, of gas, of electrical energy, and of tramways. But, while in most places they did not go far enough, in others they went too far, and by undertaking the manufacture and supply of fittings, they trod upon the corns of their own ratepayers and stirred up the enmity of local private interests.

The Electric Light

was the greatest boon, and it was essentially the poor man's light. Tramways, by withdrawing the working classes from the interior of the towns to the more open and purer air of the suburbs, solved the question of improved dwellings, and by working these railways by electrical energy, they so reduced the cost of generation of the energy that the supply of electric light could be made the most economical source of artificial illumination. Glasgow had very strangely separated the tramway house from the electric light central station, and had thus deprived its light customers of a reduction of at least one penny per Board of Trade unit. Manchester and Liverpool were wiser in their generation. Hygiene was the most important knowledge for everyone to possess, though it was, perhaps, the least acquired. That Institute had recognised the desirability of encouraging the

Teaching of Hygiene in Schools,

and it had arranged a thorough theoretical and practical examination for teachers which matured next year. "Cleanliness is next to Godliness." That was the keystone of hygiene. It promoted cheerfulness, and, after all, cheerfulness was the greatest doctor they had. An important feature of the introduction of electric light into our homes was cleanliness. It neither vitiated the air nor deposited dirt. Reports were occasionally circulated in the Press that it affected the eyes, but he had never come across a single case, and his experience in that direction was very extensive. The chief function of the Sanitary Institute was not only to dispense knowledge, but to disperse ignorance. The resistance to progress was not so much ignorance itself, but the determination to remain ignorant. The

Work Done by the Institute

was of national importance. It removed public apathy, and exerted enthusiasm in good work, in new discoveries, and in imparting knowledge to those who were willing to receive it. They must never forget that every true step in advance taken by Science brought the engineer to a point from which there was no retrocession, but from which further advance was possible.

In the evening the Health Exhibition was opened by the Mayor, when there was a most encouraging attendance. Dr. Louis Parkes gave a short address, in the course of which he mentioned that the Institute had now held seventeen congresses and exhibitions, and this was one of the very best of the exhibitions—certainly it was in the first rank. This could be seen in the large number of awards already made, and no medals were given, he added, without careful tests. In the manufacture of sanitary appliances, he went on to say, England was still ahead of every other country.

Sir Henry Littlejohn proposed a vote of thanks to the Mayor for having opened the exhibition, and also for the great interest which he had shown in the visit of the Institute. Alderman Tilling seconded the vote, which was carried with acclamation.

On Wednesday, Thursday, and Friday the various sections met, when many instructive and useful papers were read and discussed. As we are unable in this issue to spare the space that necessarily these papers demand, it is our intention for the next two or three weeks to publish *in extenso* some of the papers that we think will prove most interesting to our readers.

In the afternoons of these days the local committee had arranged excursions to and inspections of various places of interest, such as the Electrical Works, the Isolation Hospital, the Sewage Works, the Waterworks, Hospital Ships, all of which were largely patronised, while pleasure parties were found in Lady Creighton's garden party, the "at home" given by Surgeon-General Nash and officers at Netley Hospital, water trips to the Isle of Wight, an excellent "at home" given by the directors of the Union Line on board the s.s. "Scot," a drive through the New Forest, and lastly, by kind permission of Her Gracious Majesty, a visit to Osborne House and grounds. The Mayor's reception on Wednesday evening, given in the Pier Pavilion, was largely attended, over 1,000 people passing before his Worship and the Mayoress. The Congress will meet at Nottingham next year.

THE EXHIBITION.

This occupies the whole of the Skating Rink and Victoria Rooms as well as a large temporary building connecting the two halls. The general arrangements are good. There are, in all, some 125 stands, though we missed some firms of note, such as Messrs. Twyford, Ltd., Messrs. Jas. Woodward, of Swadlincote, Messrs. Wragge, Bermantofts, and others. We heard a complaint last year at Birmingham and again here at Southampton that may possibly account for the absence of some of these firms. One or two leading sanitary ware manufacturers said it seemed both unfair and absurd that gold and silver medals should go to cocoas, cornflours, meat extracts and patent medicines, while the *bona fide* sanitary exhibitors who took large stands, spent much money, time and labour, in perfecting inventions, such as closets, urinals, sinks, gullies, pipes, junctions of various kinds, and such like—should be only rewarded by bronze ones. To our mind this is a most legitimate complaint and one worthy of the attention of the Council before next year.

One of the cleanest and brightest exhibits in sanitary ware in the hall was that of Messrs. Geo. Howson and Sons, Limited. That our opinion was correct is proved by the fact that this firm received no less than four bronze medals. Among their specialities was "The Westwood Improved Household Combination sink," made in various sizes, fitted with patent receiver for drying board. Another interesting article was their "Patent lavatory basin with syphonic overflow"—a prevention for overflowing taps and also accumulation of soap suds or refuse generally.

Messrs. Duckett and Son, Burnley, had a large and varied exhibit. Here we saw a range of five isolated syphonic closets in amber and white. These were automatically flushed from an overhead cistern; the effect being a double syphonic action, the first in the cistern and the second at the outlet. The second syphonic action is stopped automatically before the flushing tank has discharged its contents, thus providing an after flush to recharge the basins with clean water. Another closet worthy of note was their "Clincher Closet," a clean water wash-down closet, which obtained a bronze medal at Leeds in 1897, and again here at Southampton. The flush is divided by an oblique channel in the ware, and meets again opposite the outlet, where the joined force of water is equalised by the introduction of a small partition.

Messrs. W. Glover and Sons, Ltd., Warwick, obtained a silver medal for their "Tipping Dust Van." This van took the premium offered by the London County Council. There were 325 competitors, and the Liverpool Corporation have since purchased the van. This dust van is fitted with a patent wind guard, a sliding cover, and a simple lever for the tipping apparatus. The advantages claimed are simplicity and durability, lightness of draught, easy tipping, lowness for filling. This should prove a great boon to many councils.

Messrs. Henry Rossell and Co., Ltd., Sheffield, had a boiler front on view fitted with their patent automatic smoke preventer. The apparatus consists of a series of panels which are opened and shut by the action of a cataract cylinder. This furnace door is peculiarly adaptable to places where steam boilers and furnaces are largely used. The process is simple and automatic. Our contemporary *The Engineer*, writing on this subject of smoke abatement a few weeks ago, commended Rossell's Automatic Furnace Door very highly, and said that it was a great improvement on the late Mr. Prideaux's invention.

[Our notice of many important exhibits is held over till next week.]

(*To be continued.*)

PREVENTION OF SMOKE.*

By THOS. G. DEE, A.S.I.

(*Concluded from p. xxviii., No. CCXXXVIII.*)

As coal rich in hydrogen forms a larger proportion of hydrocarbons than are formed from that poorer in hydrogen, and these are distilled off first, they require that the air to combine with those volatile gases shall enter the chamber above the coal, and in varying quantity and intermittently, thus differing from the necessary admission of air through the incandescent carbonised coal on the firebars at a later stage in the combustion.

Before, however, referring to the history of boiler furnace invention, I desire to point out that the regulation of air inlet and outlet to boiler power is largely a question of the height and area of the chimney. A formula for the calculation of the area necessary at the top of the chimney may be advantageously brought in here; it is as follows:—

$$\frac{\text{Lbs. of coal used per hour per H.P.} \times 12 \times \text{H.P.}}{\sqrt{\text{height of chimney.}}} = \left\{ \begin{array}{l} \text{in square inches the} \\ \text{area of the top of} \\ \text{the chimney.} \end{array} \right.$$

If we assume that 10lb. of coal are used per hour for each horse power, then for a 30 h.p. boiler with a round chimney 81ft. high an area of 400 square inches is required, *i.e.*, a diameter of 23in. The following is an application of the above formula to this case:—

$$\frac{10 \times 12 \times 30}{\sqrt{81}} = \frac{3600}{9} = 400 \text{ sq. in. area} = 23\text{in. diameter.}$$

In furnace construction many methods to accomplish the perfect combustion of coal have been invented both to avoid the variations due to the different ability of stokers, and also, if possible, to burn a refuse coal. One of the earliest recorded patents for boiler furnaces is that of Dr. Papin, in 1695, and a great many specifications are set out in the various patents granted late in last century and in the first half of the present century, which include nearly all the special points claimed for modern furnaces.

As it is necessary to admit air in larger proportions on the surface of the fire when coal is put on, so that the first gases as they are freely disengaged may be fully oxidised, automatically closing doors are good.

When a furnace is fed through an open door, great care should be used to properly apply the damper, or a rush of cold air is admitted, thus preventing the attainment of the proper temperature in the mixed gases for combustion, hence automatic stokers which prevent opening doors and spread coal evenly are good, as are also those arrangements whereby the air is heated previous to its distribution in the furnace.

Again, the disengagement of the first gases at a modified rate tends to prevent imperfect combustion, hence cooking furnaces are very good.

The nature of the gases present in the chimney of a furnace and their relative proportions are the proper tests of the efficacy of a furnace, whether we consider it from the public health point of view, with respect to the substances added to the atmosphere, or from the water evaporating power, and the difference of these two aims is small, but unfortunately vital, because a furnace with a slightly smoky chimney is rather more effective as a steam producer than a perfectly clear one (Proc. Inst. Civ. Eng., 1892-3).

The gases leaving the chimney should, in round numbers, be as follows, or approximate thereto:—

Carbon Monoxide, none.	Carbon Dioxide 10%
Sulphuretted Hydrogen, none.	Oxygen ... 8%
Sulphur Dioxide, variable.	Nitrogen ... 82%

As possessing in one apparatus almost all the features which have been aimed at in the many patents in the list of furnaces and furnace appliances that have been taken out, the Murphy Automatic Smokeless Boiler Furnace is, in my opinion, the most perfect modern form. This furnace is very largely used in America, and can be seen in daily use at Lincoln Works,

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* A paper read before the Annual Provincial Conference of the Sanitary Inspectors Association at Lincoln on August 4th.

Chesterfield, under the control of the sole licensees for the United Kingdom, Messrs. Clench and Co., Ltd. The furnace is fed automatically and to magazines at the sides of the fire.

The green fuel is placed there on coking plates, and the gases of distillation are distributed at that part of the furnace where they can most readily be brought into contact with the air which is entering in divided streams, and has been heated by convection in passing through, and by radiation from the fire-brick arch.

The inclination of the two sets of bars towards each other, together with the rocking movement of the bars, tends to maintain a very even fire, whilst the rotation of the clinker breaker keeps the fire clean, so that the carbonised fuel is always maintained in an incandescent state.

The last phase of this question is that which practically concerns us, that is to say, the law and its application.

You all are fully acquainted with the wording of the sections under which we act, and know the danger which we have to face in the pitfall of the definition "consume or burn the smoke as far as practicable, having regard to the nature of the manufacture or trade," and whilst a knowledge of the theory of combustion will be of great use to us in cases we are compelled to take under those provisions of the Acts, I wish to point out those exemptions are with respect to smoke of any colour except black. If we therefore confine ourselves in all cases of the emission of black smoke to the general provision of "any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance," I am of opinion that our difficulties will be minimised. For (first) the owners cannot put up the servant as the proper defendant (Barnes v. Akroyd, L.R. 7, Q.B. 474). Nor is it any defence to prove that as far as practicable the furnace does consume the smoke arising from the combustible used therein (Weekes v. King, 53 L.T., N.S. 51). Neither is it necessary to prove that the smoke is injurious to health (Gaskell v. Bayley, 80 L.T. (N.S.), 516).

Much, therefore, depends upon the facts of our observations, and as to those the individual inspector must be the responsible person, and whilst avoiding fear on the one hand and rashness on the other, he must steadily proceed to fulfil his duty, being true to himself and thereby false to no man.

The principal fact to be determined is what is black smoke, and in arriving at this I beg of you not to be led to give the slightest consideration to diagrams in which *black* lines of varying thicknesses and distances apart are drawn upon pieces of white cardboard and viewed from a given distance. Such a method of mixing up the result of *black* lines and white cardboard to produce a general grey effect does not alter the colour of the *black* line. Neither is the fact that the smoke is black altered because of its different density when viewed against the sky, it giving an apparent variation of the colour due to the effect of the relative amount of these two factors.

Certainly, if a very small amount of black smoke is being sent forth from a chimney, it is for the inspector to determine if, in his opinion, that quantity is a nuisance, and to report it or not, as he decides whether, or not, in his judgment the law has been infringed.

Doubtless what is or is not a nuisance must be partially determined by the character of the neighbourhood in which the chimney is situated. For example, in such a residential neighbourhood as Westminster, where I am engaged, with its blocks of high-class flats rearing lofty heads to heights of 80ft., 90ft., and even 110ft. above the street level, black smoke, even in small quantities, from the electric light works, lift and heating works, hotels, restaurants, &c., which abound in their immediate neighbourhood, cannot escape being a nuisance, while a much larger amount of smoke in the midst of factories surrounded by the houses of the people who earn their daily bread within them will doubtless for the present be tolerated, whilst our work of educating steam producers on this question is proceeded with.

I think that such guides as an allowance of two and a half minutes' dense black smoke, or ten minutes' black smoke of medium density in thirty minutes, which are given in some towns as standards, the infringement of which the Local Authorities will bring before the justices, are a somewhat unwise invitation to furnace-owners to aim low and thus prevent the attainment of that possibility, a smokeless chimney.

It is advisable to remember that at the last International Congress of Hygiene and Demography, held in England, W. S. Thiselton Dyer, Esq., F.R.S., Director of Kew Gardens, permitted the result of an analysis of the solid deposit from the atmosphere, found on plant houses in London, to be published. Of this deposit it was found that thirty-nine per cent. was carbon. I do not, of course, forget that the greater part of that carbon came from the chimneys of private dwelling houses, to which at present our duties do not extend.

In conclusion, then, let us determine in this, as in other phases of our multifarious duties, to so labour, that as far as it lies in our power the public shall have an unpolluted atmosphere; the conscientious furnace user shall receive the full advantage of our knowledge and experience to aid him in determining the most suitable method to be adopted to his special need in the prevention of the emission of black smoke; the persistent offender shall be reported again and again, the unsympathetic magistrate who fines but rarely and then lightly shall be wearied into well doing; and a grateful public shall in effect say to us that as we have been faithful in these matters they will trust us with stronger powers by giving us such a tenure of office that the author of a text-book on sanitary inspectors' duties may eliminate that portion of his work which infers or states that because the manufacturer and the smoke producer have influence on every Town Council the inspectors must in this matter proceed with caution.

Masters and Men.

Glasgow Corporation Labourers' Wages Advanced.—The Statute Labour Sub-Committee have agreed to recommend that the following advances of wages be made:—Masons' labourers engaged at the sewers, from 23s. 9d. to 25s. a week during the summer, with an extra holiday; ordinary labourers, from 21s. to 22s. a week, with an extra holiday; causeway beaters, 1s. a week; and settmakers, ½d. an hour.

The Yorkshire Building Dispute.—At a meeting of the Leeds Master Builders' Association, on Tuesday, last week, the result of the voting on the proposal to grant an advance of a halfpenny an hour to the London Order of Bricklayers was announced. Eighty-seven papers had been sent in, seventy-nine votes being registered against the granting of an increase, the remaining eight being in favour of it. The result of the voting will be communicated to the Yorkshire Federation at a future meeting.

Inverurie Stonecutters on Strike.—Some trouble has arisen between the Inverurie Branch of the Masons' and Stonecutters' Union and the firm of Messrs. Paul and Ritchie, stonecutters there, owing to the firm declining to sign the operative by-laws. On Wednesday, as a consequence of the dispute, the Union operatives of the firm quitted work. A meeting of the Inverurie branch was held the same evening, at which it was decided to put the yard down as a non-union job. It was reported that the operatives who had left work had all found jobs elsewhere.

The Bricklayers' Labourers' Strike at Leicester has now been on for over twenty weeks. The cause of the dispute is the men's demand for an advance of ½d. per hour. Six members of the Employers' Federation and thirty-six non-federated employers are paying the increase, but 400 men are still in receipt of strike pay, which has been raised from 10s. to 12s. a week.

Plasterers' Dispute in Manchester.—A meeting of employers in the allied building trades was held on Tuesday, last week, in Manchester, under the presidency of Mr. C. W. Green, of Liverpool, when a distinct advance was made towards a settlement of the dispute in the local plastering trade, which has lasted for twenty-seven weeks. When the national dispute was settled, in June, the Manchester employés declined to go to work again except at an advance in wages of a penny per hour. The employers offered a halfpenny advance forthwith, and another at the end of twelve months; but this the men would not accept, and a deadlock ensued. At this meeting, however, the men wrote offering to take the second advance at the expiration of six months. On this basis the employers decided to meet the men in conference on Thursday. At the meeting on Thursday a settlement was arrived at, the terms being that the plasterers should resume work on September 11 at an advance of ½d. per hour, with the promise of a further increase of ½d. in six months.

Builders' Notes.

A Gainsborough Painter in Difficulties.—The creditors of James Noble, painter and decorator, of Gainsborough, met at the office of the Official Receiver, Lincoln. The debtor's statement showed gross liabilities £1,337 19s. 3d., of which, however, only £205 19s. 3d. is expected to rank for dividend. The estimated assets are £80 10s, leaving the deficiency £125 9s. 3d. No resolutions were passed.

New Brick Works at Blyth.—New brick works, on an extensive scale, have been commenced at Blyth by the Albion Brick Company, Limited, to work what is believed to be a valuable royalty of clay on the outskirts of Blyth, near the Cowpen Colliery. The royalty comprises twenty acres, leased from the Thornton and Croft trustees, and the seam of clay, which is 20ft. thick, and of good quality, lies only a few inches from the surface. The works are equipped to produce a daily output of about 20,000 bricks.

Chorley Builders' Affairs.—The first meeting of creditors in the estate of Thomas Homer, senior, 227, Eaves Lane, and Thomas Homer, junior, residing at 2, Kershaw Street, Chorley, lately carrying on business in copartnership as builders under the style of Thomas Homer and Son, at Eaves Lane, Chorley, was held on Tuesday last week at the offices of the Official Receiver, Wood Street, Bolton.—The Official Receiver's statement set forth that the bankrupts, who are father and son, were journeymen bricklayers up to June, 1896, when they entered into partnership as builders, though they had only £8 of capital between them. They commenced erecting houses, obtaining advances as the buildings progressed. Eventually they got pressed by creditors for the materials they had obtained for the construction of the properties, and filed a petition in bankruptcy. The gross liabities were put down as £3,763 15s. 6d., of which £3,403 was due to fully secured creditors. The estimated value of securities was put down at £3,630, and after making all allowances there was an estimated surplus of assets amounting to £140 7s. 8d. The debtors attributed their failure to "speculative building." Both father and son attended the meeting, and were closely questioned by creditors and by the acting Official Receiver. — Ultimately the matter was left in the hands of the Official Receiver.

The House for Sisters of Mercy at Dungarvan is being warmed and ventilated by means of Shorland's patent Manchester Grates.

East Pentire Estate, Newquay, Cornwall.—The sale of the first portion of this estate was held by Messrs. Protheroe and Morris, of 67 and 68, Cheapside, London, on the 26th August. The estate has quite recently been acquired by the West Newquay Syndicate, Limited, whose registered offices are 20, Budge Row, Cannon Street, London, E.C. The plan of the estate was prepared by Mr. John Ennor, junr., of Newquay, and the solicitors were Messrs. Vincent and Vincent, of 20, Budge Row, Cannon Street, London, with whom were associated Messrs. Collins and Sons, of St. Columb and Newquay. The prices realized for the various plots were as follows: Esplanade Road, lot 8, £200; lot 7, £175; lot 6, £130; lot 5, £125; lot 4, £120; lot 1, £130. Pentire Avenue, lot 28, £75. Pentire Crescent, lots 72 to 80, £40 each, the buyer of lots 72 to 76 also taking lot 71 at the same figure. Gannel Crescent, lots 81 to 88, and 91, £50 each; lot 89, £54; lot 90, £52. Pentire Crescent, lots 92 to 94, £115 each; lots 95 and 96, £110 each; lot 97, £105. At the request of some purchasers lot 9 was offered at the close of the sale, and knocked down at £175. There were also offers made for lots 10 to 14, but the biddings were not high enough. The lots were, however, sold privately, subsequent to the sale; as was also lot 98. The total amount realized was £3,606. The lots unsold were 2 and 3, 24 to 27, and 32 to 36; and we hear that offers have been made for some of these already.

Sunderland Docks Improvement.—The River Wear Commissioners have resolved to invite tenders for the construction of most extensive works for the enlargement of the docks. About eight and a half acres are to be added to Hudson Dock North, and coal shipping places are to be erected which will allow of the very largest vessel taking in cargo. A new timber storage ground is also to be provided, and increased facilities afforded on the river front, where a great many old houses are being demolished.

Electric Lighting at St. Helens.—Col. W. R. Hacke held a Local Government Board inquiry on Tuesday, last week, into the application by the Corporation for permission to borrow £3,600 for electric lighting extensions. Mr. Highfield, the borough electrical engineer, gave details of the scheme, and said that it would not be necessary to take up all the cables from the streets where they were already laid. They would take out only the light tension feeders. The plant for the new districts would be capable of supplying 3,500 lamps of eight candle power. The Corporation had demands for 1,200 lamps.

Surveying and Sanitary Notes.

Street Improvements at Crewe.—Colonel Slacke, R.E., held an inquiry on Thursday at Crewe into an application by the Town Council to borrow £5,459 for works of street improvement and sewerage.

Septic Drainage at Elgin.—At a meeting of the Town Council on Monday, last week, the borough surveyor submitted a report in which he estimated the cost of the septic system of drainage for the town at £7,200, and £85 per annum for management.

Disposal of Sewage at Ashton.—Colonel W. R. Slack, R.E., Local Government Board inspector, held an inquiry at the Council Offices, Bryn Street, Ashton, on Wednesday morning, with respect to the application of the Ashton Urban District Council to the Local Government Board for sanction to borrow the sum of £3,693 for sewerage and sewage disposal purposes.

Public Works at Eccles.—Colonel A. G. Durnford, R.E., inspector to the Local Government Board, opened at inquiry at the Town Hall, Eccles, on Thursday, into an application of the Town Council for power to borrow £12,200 for works of main road improvements, £1,793 for additional expenses incurred in extending and furnishing the new municipal buildings, £1,556 for works of private street improvement, and £550 for purposes of sewage disposal.

Public Improvements at Ulverston.—The Ulverston Urban Council desire permission to borrow £19,000 for the purpose of street improvements, being the purchase and rebuilding of Bryers' Smithy to allow of widening Prince Street at that point; £2,750 for purchase of the premises now occupied by the Bank of Liverpool in Queen Street, to be made into Council Offices, and £1,000 for improvements and additions to the Gas Works. Col. W. R. Slack, R.E., a Local Government Board inspector, held an inquiry recently into the application.

Sewage Disposal Problem at Bradford.—The disposal of sludge which remains after the treatment of sewage at the Fuzinghall Works was on Tuesday week the subject of a conference between the Sewage Defœcation Committee and the Sanitary Committee of the City Council. It has been found more expensive to treat the sludge at the destructor works of the Sanitary Committee than ordinary refuse, so it was decided at the meeting to send the sludge to be burned at the Cliff Road destructor for two months, and to prepare a return for the actual cost.

Engineering Notes.

New Light Railway for Cornwall.—The Board of Trade has confirmed the order for the construction of a light railway which will join the Great Western Railway at Marazion, near Penzance, and extend to Land's End.

Electric Current Centenary.—Coincident with the Congress of Electricians at Como, on September 18th, to celebrate the centenary of Volta's electrical researches, it has been arranged for Dr. J. A. Fleming, Professor of Electrical Engineering, University College, London, to deliver on the same day a lecture before the British Association, at Dover, on the subject of "The Centenary of the Electric Current." The lecture will deal with the question of wireless telegraphy, and will be illustrated by experiments.

Proposed Electric Lighting Extensions at Sunderland.—At the Town Hall on Tuesday, last week, Mr. R. H. Bicknell, M.I.C.E., conducted an inquiry on behalf of the Local Government Board into an application made by the Corporation for power to borrow £40,000 for the purposes of electric lighting. The Town Clerk (Mr. F. M. Bowey) stated that recently the Corporation obtained a Bill empowering them to lay down electric tramways, and they were making the present application in order to provide electric power for the trams, and also to enable them to extend their mains for the ordinary supply of light. The Commissioner complained of the absence of full drawings of the various projects, and stated that the application would not be granted until these were furnished. It was stated that the net profit on the working of the electric station last year was £352.

Proposed Improvements at Tay Ferries.—At a meeting of the Tay Ferries Committee of Dundee Harbour Trust, on Monday, last week, Mr. Robert Taylor submitted a sketch plan of an improvement on the pier and landing-places, which it is considered would do much to remove existing defects, and to ensure the more efficient conduct of the service. The proposal provides for the construction of a pontoon pier, extending 150ft. into the river. By this means a minimum depth of six feet of water would be obtainable at the lowest state of the tide. It is futher contemplated, once this plan has been carried out, to fill in the existing Craig Harbour, and to carry the Esplanade across the ground. The filling-in would place at the disposal of the Board fully an acre of valuable ground, which at £2 10s. a pole, would be worth about £400, and at 27½ years' purchase would represent a sum of between £11,000 and £12,000. Were the scheme carried out in its entirety, it would save the expense at present incurred for dredging the harbour, repairs to piles, &c., which amounted to about £600 per annum.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		BUILDINGS—		
Sept.	8	Sheffield—Twenty Cottages	Health Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
,,	8	Illogan, Cornwall—Building		T. C. Peter, Town Hall, Redruth.
,,	8	Darwen, Lancs.—Post Office		J. B. Thornley, Architect, Darwen.
,,	8	Cromarty, N. B.—Coastguard Buildings	Admiralty	Director of Works, 21, Northumberland-avenue, W.C.
,,	9	Lancashire—River Bridge	County Council	W. H. Radford, Engineer, County Offices, Preston.
,,	9	Rhyl—Intermediate School		F. H. Shayler, Architect, Welshpool.
,,	9	Brinscall, Lancs.—Store and Two Houses	Withnell Co-operative Society	J. B. Thornley, Architect, Market-street, Darwen.
,,	9	Glasgow—House	Corporation	J. M. Gale, 45, John-street, Glasgow.
,,	9	Gorey, Ireland—Alterations, &c., to Workhouse	Guardians	R. Creighton, Clerk, Workhouse, Gorey.
,,	9	Rotherham—Nineteen Houses	F. Mason	J. Platts, Architect, Old Bank-bldgs., High-st., Rotherham.
,,	11	Bakewell—Infirmary	Guardians	E. M. Longdon, Architect, Town Hall, Bakewell.
,,	11	Botriphnie, Scotland—Manse		R. B. Pratt, Architect, County Bank House, Elgin.
,,	11	Cork—Additions to Fermoy House		W. H. Hill and Son, 28, South-mall, Cork.
,,	12	Bradford—Renovation, &c., of Shed		Milnes and France, Architects, Bradford.
,,	12	Bromley, Middlx.—Office and Lavatory Accommodation	Managers of Asylum District	J. and S. F. Clarkson, 136, High-street, Poplar, E.
,,	12	Kendal—Shop, Warehouses, &c.	Co-operative Society, Limited	J. Stalker, 57, Highgate, Kendal.
,,	12	Croydon—Superstructure of Asylum	Town Council	Borough Engineer, Town Hall, Croydon.
,,	13	Dukinfield—Offices, &c.	Joint Sewerage Board	W. M. Smith, District Council Offices, Dukinfield.
,,	13	London, S.E.—Alteration to Town Hall	Bermondsey Vestry	Surveyor to the Vestry, Town Hall, Bermondsey.
,,	13	Stalybridge—Buildings	Sewerage Board	Newton, Son, and Bayley, 17, Cooper-street, Manchester.
,,	13	Birmingham—Distribution Works	Corporation	J. Mansergh, 5, Victoria-street, Westminster, S.W.
,,	13	Selly Oak, near Birmingham—Casual Wards	King's Morton Union Guardians	E. Docker, 10, Newhall-street, Birmingham.
,,	14	Bures St. Mary, Suffolk—Malt Kiln		G. H. Page, Architect, Trinity-chambers, Colchester.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Sept. 14	Hurstpierpoint, Sussex—Cemetery Works	Parish Council	H. W. Beach, Perrymount-road, Haywards's Heath.
,, 15	Enfield—Block of Schools	School Board	G. E. T. Laurence, 181, Queen Victoria-street, E.C.
,, 15	Thornbury, Glos.—Infirmary at Workhouse	Guardians	G. H. Oakley, Edinburgh-chambers, Baldwin-street, Bristol.
,, 15	Walthamstow—Materials for Electric Light Station	Urban District Council	E. J. Gowen, Clerk, Town Hall, Walthamstow.
,, 18	Bradford—Enlarging School	School Board	E. P. Peterson, 48, Sunbridge-road, Bradford.
,, 18	Wimbledon—Ten Workmen's Dwellings	Urban District Council	C. H. Cooper, Engineer to Council, Broadway, Wimbledon.
,, 18	Blackburn—Erection of Turret Clock	Parks Committee	W. Stubbs, Borough Engineer, Blackburn.
,, 19	Littlestone, Kent—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.
,, 20	Long Melford, Suffolk—Strong Room	Fisher and Steed	Fisher and Steed, Solicitors, Long Melford.
,, 25	Cerne Abbas, Dorset—Building Works at Workhouse	Union Guardians	A. E. A. Cole, Union Offices, Cerne Abbas, Dorset.
,, 27	London, W.—Alterations at Woodfield House	Paddington Guardians	F. J. Smith, Parliament-mansions, Victoria-street, S.W.
,, 30	Hallwill, Devon—Cottage Hospital	....	C. F. A. Voysey, 6, Carlton Hill, N.W.
Oct. 3	Watford—Offices and Warehouse	Benskin's Brewery, Limited	C. P. Ayres, 14A, High-street, Watford.
,, 3	London, S.E.—Underground Urinal	County Council	Architect's Department, 13, Spring-gardens, S.W.
,, 11	Tooting, S.W.—Asylum	Metropolitan Asylums Board	A. and C. Harston, 15, Leadenhall-street, E.C.
,, 12	Wolverhampton—Workhouse Infirmary	Union Guardians	A. Marshall, Architect, King-street, Nottingham.
	ENGINEERING—		
Sept. 9	Airdrie, Scotland—Reservoir	Water Company	M'Creathe & Stevenson, 208, St. Vincent-street, Glasgow.
,, 9	East Ham—Electric Lighting, &c.	Urban District Council	W. C. Ullmann, The Limes, White Post-lane, East Ham.
,, 9	Keighley—Filtration Tanks	Rural District Council	Barker, Hopkinson, and Co., Craven Bank-chbrs., Keighley.
,, 11	St. Anne's-on-Sea, Lancs.—Electric Lighting Plant	Urban District Council	P. J. S. Tiddeman, Carlton-chambers, St. Andrew's-road South, St. Anne's-on-Sea.
,, 11	Carlisle—Extension of Steam Pipes, &c.	Corporation	Town Clerk, Carlisle.
,, 11	Fairlie, Ayrshire—Waterworks	County Council	P. C. Hart, 32, John Finnie-street, Kilmarnock.
,, 11	Preston—Bridge	Lancashire County Council	W. H. Radford, County Bridgemaster, County Offices, Preston
,, 11	Walsall—Bacteria Tanks	Corporation	Borough Surveyor, Bridge-street, Walsall.
,, 11	London, E.C.—Locomotives, &c.	Bengal and N.W. Railway Co., Ltd.	E. L. Marryat, 237, Gresham House, Old Broad-street, E.C.
,, 12	London, E.C.—Bridgework	Bengal Nagpur Railway Co., Ltd.	Office, 132, Gresham House, Old Broad-street, E.C.
,, 12	Southport—Tramways	Corporation	J. D. Williams, Town Clerk, Town Hall, Southport.
,, 12	London, N.E.—Dynamos	Hackney Vestry	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 12	Bournemouth—Boiler	Town Council	F. W. Lacey, Borough Engineer, Bournemouth.
,, 13	Ilford—Railways	Great Eastern Railway Co.	Engineer, Liverpool-street Station, E.C.
,, 13	Bermondsey—Electric Light at Town Hall	Vestry	Surveyor, Town Hall, Bermondsey.
,, 14	Birmingham—Water Distribution Works	Corporation	J. Mansergh, 5, Victoria-street, Westminster, S.W.
,, 14	Leyton—Pumps, &c.	Urban District Council	Engineer, Electricity Works, Cathall-road, Leytonstone.
,, 14	Grays, Essex—Refuse Destructor	Thurrock Urban District Council	A. C. James, Surveyor, District Council Offices, Greys, Essex.
,, 14	Southborough, Kent—Sinking Well	Urban District School Board	G. and F. W. Hodson, Engineers, Southborough.
,, 18	Maldon, Essex—Waterworks	Rural District Council	H. G. Keywood, Engineer, 6, Market Hill, Maldon.
,, 18	Fareham, Hants—Air-tubes and Pump Ventilators	County Asylum	W. J. Taylor, County Surveyor, The Castle, Winchester.
,, 18	London, N.—Bridge Works	Hornsey Urban District Council	E. J. Lovegrove, Engineer, Southwood-lane, Highgate, N
,, 20	Heckmondwike—Electric Light Plant	Urban District Council	W. C. C. Hawtayne, 9, Queen-street-place, London, E.C.
,, 21	Southampton—Tramways	Corporation	Borough Engineer, Municipal Offices, Southampton.
,, 22	Luton—Electric Lighting Plant	Town Council	A. T. Snell, Engineer, Suffolk House, Cannon-street, E.C.
,, 25	Guildford—Reconstructing Bridge	Rural District Council	N. Lailey, 16, Great George-street, Westminster.
,, 25	Ilfracombe—Plant	Urban District Council	W. H. Frentham, 39, Victoria-street, Westminster, S.W.
Oct. 14	Tiflis—Tramways Concession	Town Council	Managing Department of Council, Tiflis, Transcaucasus.
,, 24	Barking, Essex—Light Railway Plant	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
Nov. 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
Jan. 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
	IRON AND STEEL—		
Sept. 9	East Ham—Steel Girder Tramway Rails	Urban District Council	W. C. Ullman, Engineer, The Limes, White Post-la., East Ham.
,, 25	Denbigh—Locks	North Wales Asylum	W. Barker, Clerk to Visiting Committee, Asylum, Denbigh.
	PAINTING AND PLUMBING—		
Sept. 8	Cardiff—Building, &c., Materials and Glazing	School Guardians	A. J. Harris, Queen's-chambers, Cardiff.
,, 9	Downpatrick, Ireland—Repairing Public Pumps, &c.	Rural District Council	J. W. Montgomery, Executive Sanitary Officer, Downpatrick
,, 14	London, S.W.—Painting, &c.	Fulham Board of Guardians	T. A. Marsh, Clerk, Fulham-palace-road, Hammersmith.
	ROADS AND CARTAGE—		
Sept. 8	Cromer—Works	Urban District Council	A. F. Scott, Surveyor to Council, Church-street, Cromer.
,, 9	Dollar, Scotland—Works	Commissioners	J. S. Henderson, Clerk, Alloa.
,, 11	Arnold, Notts.—Works	Urban District Council	J. R. Swift, Front-street, Arnold.
,, 11	London, E.—Paving, &c., Works	Limehouse Board of Works	S. G. Radcliff, Clerk, White Horse-st., Commercial-road, E.
,, 11	Ryton-on-Tyne—Cartage	Urban District Council	J. P. Dalton, Surveyor, Ryton-on-Tyne.
,, 11	Bournemouth—Road	....	F. W. Lacey, Borough Engineer, Bournemouth.
,, 12	Cardiff—Forming, &c., Roads	Corporation	W. Harpur, Borough Engineer, Town Hall, Cardiff.
,, 13	Croydon—Materials	Rural District Council	S. Stallard, Highway Surveyor, Town Hall, Croydon.
,, 13	Eltham—Paving, &c., Works	Lee Board of Works	G. W. Rale, Clerk, Eltham-green, Eltham.
,, 13	Lee—Paving, Repairs, &c.	Board of Works	Clerk, Woodstock-road, Lee.
,, 13	Old Charlton—Paving	Lee Board of Works	J. Rowland, Board's Surveyor, Old Charlton, London.
,, 13	York—Road Diversion, &c.	North-Eastern Railway Company	W. J. Cudworth, Company's Engineer, Darlington.
,, 14	Sunbury-on-Thames—Materials	Urban District Council	H. F. Coales, Surveyor to Council, Sunbury-on-Thames.
,, 14	Gosport—Various Stores	Urban District Council	H. Frost, Surveyor to Council, Gosport.
,, 16	Barnet—Repaving Streets	Urban District Council	W. H. Mansbridge, 40, High-street, Barnet.
,, 16	Epsom—Guernsey Granite	Urban District Council	E. R. Capon, Surveyor, Bromley Hurst, Church-st., Epsom.
,, 18	York—Street Works	Corporation	A. Creer, City Engineer, Guildhall, York.
Oct. 2	Handsworth, Staffs.—Stone	Urban District Council	E. Kenworthy, Surveyor, Council House, Handsworth.
	SANITARY—		
Sept. 9	Middleton-Saint-George—Removal of Scavenings	Council	J. Campbell, Clerk, Houndgate, Darlington.
,, 11	Hindley, Lancs.—Sewer	Urban District Council	A. Holden, Surveyor to Council, Hindley.
,, 11	Bingley—Lime	Gas Committee	G. D. Malam, Gasworks, Bingley.
,, 12	Hunslet, near Leeds—Sewers, &c.	Rural District Council	S. Shaw, Engineer, Union-street, Dewbury.
,, 12	Islington, N.—Supply of Barges & Removal of Slop, &c.	St. Mary's Vestry	Vestry Depot, Liverpool-road, N.
,, 13	Eltham-Sewer	Lee Board of Works	G. Whale, Clerk, Eltham-green, Eltham.
,, 13	St. Germans, Cornwall—Drainage Works	Rural District Council	F. W. Cleverton, 4, Buckland-terrace, Plymouth.
,, 18	London, W.—Barging away Dust, &c.	St. Mary Abbott's Vestry, Kensington	W. Weaver, Surveyor to Vestry, Town Hall.
,, 18	Hornsey—Sewers, &c.	Urban District Council	E. J. Lovegrove, Engineer, Southwood-lane, Highgate, N.
	TIMBER—		
Sept. 11	London, S.E.—Timber Paving Blocks	Camberwell Vestry	W. Oxtoby, Surveyor, Vestry Hall, Peckham-road, S.E.
,, 22	Hull—Timber	Corporation	A. E. White, City Engineer, Town Hall, Hull.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Sept. 15	Workington—Town Hall	£40, £20, £10	W. L. Eaglesfield, Surveyor, Town Hall, Workington.
,, 15	Dumfries—Public Library	....	J. Grierson, Town Clerk, Dumfries.
,, 16	Norwich—Bank	£52 10s., £21, £10 10s.	Secretary, Norfolk and Norwich Savings Bank, C.E.Y.M.S. Rooms, Norwich.
,, 28	Hay, Brecknock—Sewerage and Water Supply	£25	C. Griffiths, Clerk to Rural District Council, Hay.
,, 30	Tunbridge Wells—Designs in Tunbridge Ware	£3 3s., £2 2s., £1 1s.	Technical Education Committee.
Oct. 17	Blackpool—School for 1000 Children	....	T. Loftos, Clerk to School Board, Town Hall, Blackpool.
Nov. 30	Island of New Providence, Bahamas, West Indies—Public Market	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *viâ* New York.
No date.	Howden—Water Supply	£10 10s.	H. Green, Clerk to Rural District Council, Howden.
,,	Broughton Moor, Cumberland—Institute and Twenty Cottages	....	Flimby and Broughton Moor Colliery Co., Maryport.

Property and Land Sales.

FREEHOLD BUILDING ESTATE, fronting on main road and close to golf links and Highgate Woods, seven minutes' walk from Muswell Hill and East Finchley stations. To be LET on lease or SOLD in plots. Liberal advances to responsible builders if required. For plans and particulars, apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington-road, N. 7

An acre of singularly valuable Freehold land, 270 yards from the Stock Exchange and opposite the north end of Throgmorton-avenue, Throgmorton-street, City, to be let upon 80 years' building lease direct from the Corporation, with a fully-licensed house thereon.

MESSRS. REYNOLDS and EASON are instructed by the Bridge House Estate Committee of the Corporation of the City of London to LET by PUBLIC AUCTION, at the Mart, Tokenhouse-yard, in OCTOBER, 1899, the above singularly valuable SITE of 44,038 square feet, with extensive frontages on Blomfield-street, London Wall, and Finsbury-circus.

Particulars, plans, and conditions of letting may be had, when ready, either of the City Comptroller, or the City Surveyor, Guildhall, E.C.; at the Mart, Tokenhouse-yard; and of the AUCTIONEERS, 43, Bishopsgate-street Without, E.C.

SALE DAYS for the Year 1899.
Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, Sept. 21
Thursday, Oct. 12
Thursday, Oct. 26
Thursday, Nov. 16
Thursday, Nov. 23
Thursday, Dec. 7
Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

Seaside and other Land Sales.

MR. F. G. WHEATLEY is instructed to offer for SALE by AUCTION plots of exceedingly ripe FREEHOLD BUILDING LAND (tithe free and land tax redeemed), on the following ESTATES

SEPTEMBER 13TH, 1899.

WIMBLEDON.—Raynes Park Estate.—Within 10 minutes of Raynes Park Station, with its excellent train service, 20 minutes from Waterloo. 77 plots of ripe Freehold Building Land, suitable for villas and small houses. Good road. Water laid on. Golf links adjoin estate.

SEPTEMBER 28TH, 1899.

CHURCH STRETTON, Shropshire, known as the Highlands of England, 13 miles from Shrewsbury, famous for its bracing air and medicinal properties of its mineral waters. Excellent golf links. Good hunting and shooting. About 80 plots, commanding fine views of the Stretton Hills. Return tickets for London buyers, including bed and meals, on 27th and 28th, price 10s., but early application is necessary.

Luncheon is always provided at the place of sale.

Payments by instalments extending over a term of years, if desired, and free conveyances.

Particulars, plans, and railway tickets may be obtained on application to the Auctioneer, Mr. F. G. WHEATLEY, 263, Strand (next the Law Courts), W.C.

ANSELL and MALLOWS, Architectural Draughtsmen and Quantity Surveyors, 21, Buckingham-street, Strand, W.C.

R.I.B.A. EXAMS. PREPARATION, personally or by correspondence, in three, six, nine, or twelve months' courses. Architectural Lending Library. Special three months' finishing courses. — For full particulars apply to Messrs. HOWGATE and BOND, Associates R.I.B.A., Perchard House, 70, Gower-street, W.C. (close to the British Museum.

ARCHITECTURAL Institute, Society of Architects, and Civil Service Technical Examinations. Preparation by correspondence, personally, or in residence. Seventeen first places.—MIDDLETON and CARDEN, 19, Craven-st., W.C. 1

PLANS, Applications, &c., Prepared by an experienced Architect. Advice given in Building Act questions, and disputes settled. — Address, Architect," 17, Algarve Road, Earlsfield, S.W. 3

FOR SALE in the MIDLANDS, Builder and Contractor's BUSINESS and PREMISES, including a first-class and nearly new Steam Joinery Plant, with extensive Shop, Stables, and Residence, nearly new, and specially built for the business. Last ten years' annual income from £600 to £700. Will clear for £1,800.

Reason for selling, going out of business. The above in a healthy country district. — Apply Box 1165, "BUILDERS' JOURNAL" Office. 5

THE SANITARY INSTITUTE.
LECTURES AND DEMONSTRATIONS FOR SANITARY OFFICERS, MEAT INSPECTORS, AND OTHERS.

The Twenty-eighth Course of LECTURES will be held at the Parke's Museum, Margaret-street, W., on MONDAYS, WEDNESDAYS, and FRIDAYS, commencing SEPTEMBER 15th.

The course includes, in addition to the Lectures, a number of Practical Demonstrations and Inspections at places illustrative of sanitary practice and administration.

Full particulars can be obtained at the Offices of the Institute, Margaret-street, W. 1

PERSPECTIVES.

E. BECKITT LAMB,
31, CRAVEN-STREET, STRAND,
and TUNBRIDGE WELLS.
2

SANITARY DRAINAGE WORK —Brickwork, Pointing, Dilapidations, Alterations, &c., taken Contract by a practical Bricklayer, with plant and materials, or labour only, in large or small quantity. Town or country.—S. KIRBY, 83, Canterbury-road, Kilburn, N.W. 1

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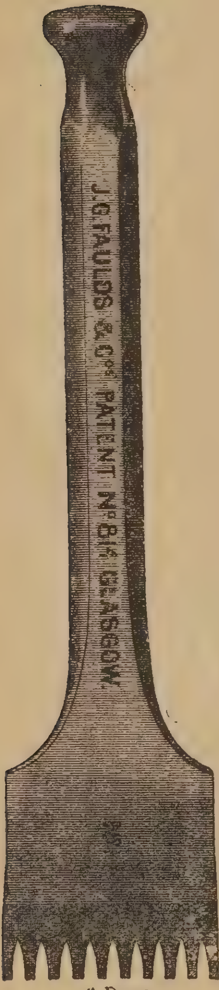
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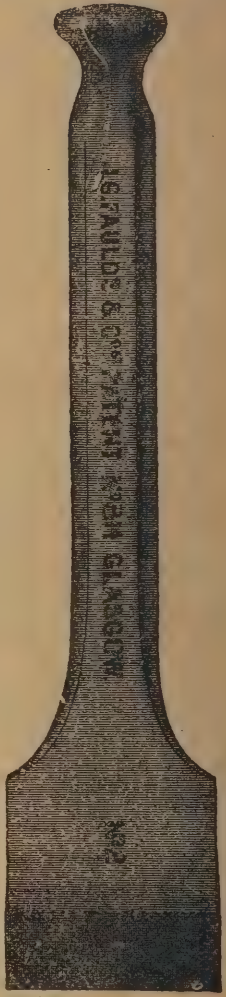
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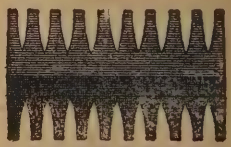

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SEPTEMBER 13, 1899.
No. CCXL.

EFFINGHAM HOUSE,
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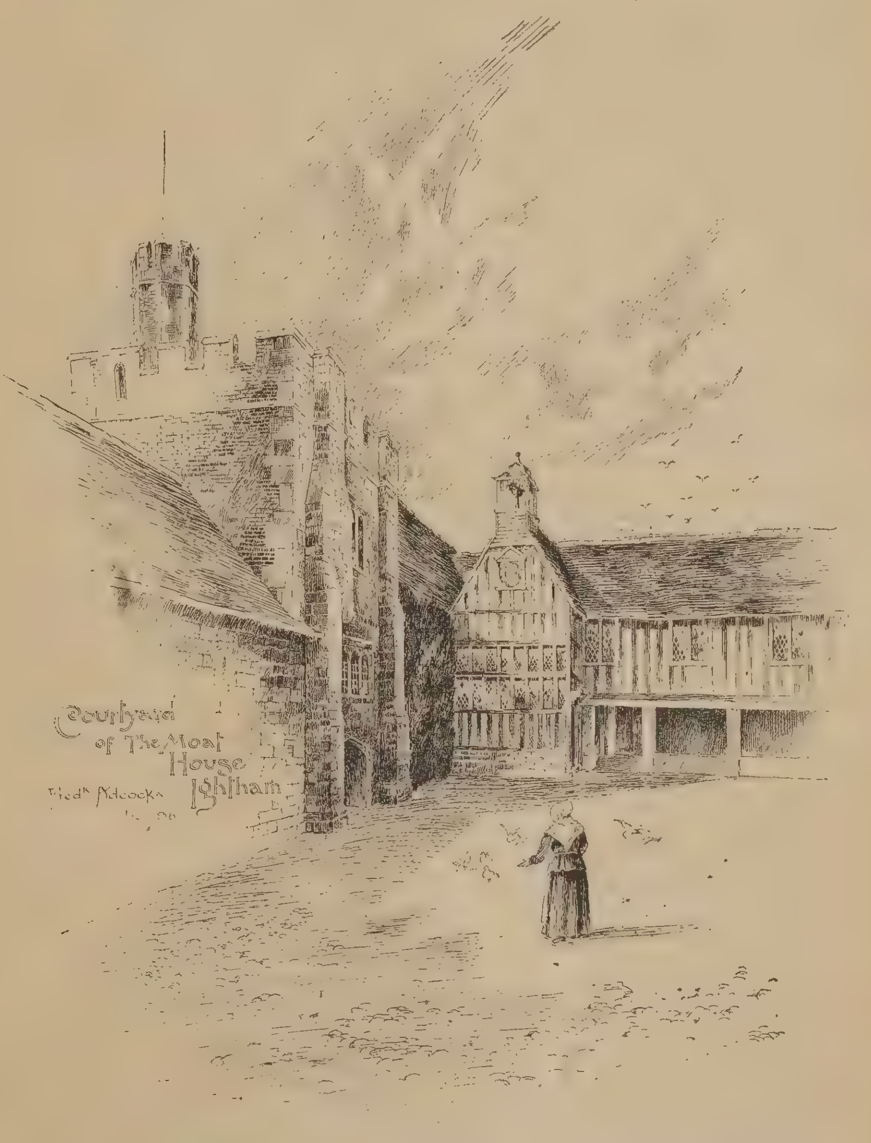
An Architectural Causerie.

The Regeneration of Bloomsbury. BLOOMSBURY is in the course of a Renaissance. Neglected for the last forty years or more, from a time, that is to say, when the market-gardens of Brompton began to be built upon and South Kensington to be called into existence, it is now enjoying a new period of appreciation. Wanderers into the outer suburbs—the professional men who gasped for air and modified rusticity, and lived for awhile beyond the circle of the smoke—have returned, disillusioned. They made their exodus in such numbers that they, in effect, took the town with them and set up settlements among the cows and the buttercups. You may see some of those outlying settlements to-day, over the Surrey hills and on the borders of Kent, in a very derelict condition indeed. There is Bellagio, the once much-advertised colony of bungalows, seated among the hills and the woodlands, and half deserted, like a played-out Californian mining-town, waiting for some new Stevenson to weave a story round it, whose colonists have returned to what Cobbett was never tired of calling "The Wen," the forgiving, much-abused, all-absorbing London. The wealthier and the busier residents of the nearer suburbs, too, have set their faces again Londonwards; and where within the wide range of the Metropolis should the professional man of standing reside but in Bloomsbury? South Kensington he has tried, and found wanting, but the neighbourhood of Russell and Bedford Squares has the advantage of being "central." Life for the busy man is now cut up into something very like a Chinese puzzle. He has to fit in all sorts of irreconcilable things, and to economise the half-hours and oddments of time; and, indeed, it looks not unlike the old era coming back, when the trader lived above his shop, and the architect under the same roof with his office. How shall one whose time is valuable economise it under the circumstances of congested traffic and unpunctual trains to and from the different points of office and residence?

There is spaciousness in Bloomsbury, too; great roomy houses, built when all else westward was a wide expanse of fields, and when the way across to Hampstead and Highgate lay by brooks and meadows, with never an intervening house save some infrequent farmstead. To-day it is possible to glimpse those northern heights from the upper windows of the Bloomsbury squares, but only across an intervening sea of houses. Elbow-room is costly now, but when those squares were planned, a good deal over a hundred years ago, space was not so exigent. Therefore, the entrance-halls of those houses are not uncommonly as large as the rooms in most modern dwellings, with every other detail in order. The gardens of those squares, too, have had a century and more to develop, and contain trees of a magnificent growth, and lawns whose emerald beauty can only be reached by a long period of constant care. Bloomsbury, in its almost fifty years of neglect, has developed slums, it is true, but during the last six or seven years many of them have been put in order, and others swept away for the building of flats. There are huge blocks of flats here now, and at one time it seemed as though the whole district was going that way. But a pause has come in that fashion, and with the refitting and resanitation which many of the old houses have undergone, there is no reason why the renaissance of Bloomsbury, which has recently been so marked, should not be permanent. There was a time when the neighbouring Doughty Street was the foremost journalistic centre in London. Edmund Yates lived there for years, and so for a longer period did George Augustus Sala; and many journals, some defunct long since, and others still flourishing, have been projected in the prim houses of that thoroughfare, or in the neighbouring Mecklenburgh Square, hard by the Foundling Hospital.

C. G. H.

Ightham Moat, Kent. IGHTHAM Moat House, the most perfect and picturesque example of a "moated grange" in the south of England, is a building well worth a visit. Situated a few miles beyond Sevenoaks, it is within easy distance of London. The Moat House stands about two miles south of Ightham village. It is built of stone, and forms a quadrangle. The building is surrounded by a moat which washes the outer walls. The main entrance is by a bridge and gateway giving access to the courtyard. The house is of three distinct periods: Edward the Third; then Henry the Seventh and the beginning of Henry the Eighth; the third, Elizabeth and James the First. The hall, one of the most interesting features of the house, is spanned by a central stone arch with a principal rafter on each side; the mouldings on the stone arch and on the principals are of the decorated period. There is an opening in the roof which was made as an outlet for the smoke when a stone hearth was used in the centre of the hall. The present fireplace is of the Elizabethan period as is also the large window in the hall, the other windows being decorated. The chapel is not so old as the hall, being built about 200 years later. At the east end of the chapel is a small apartment giving access to the main building. The original painted ceiling remains, emblazoned with the badges of Henry the Eighth, Katherine of Aragon, and former owners of the Moat House. The house came into the possession of the Selbys of Northumberland in 1592, and remained in the Selby family until 1888. Our illustration is from the pen of Mr. Frederick Adcock.


Courtyard of The Moat House Ightham
Fredk Adcock

COURTYARD OF THE MOAT HOUSE, IGHTHAM. DRAWN BY FREDERICK ADCOCK

Builders' Weights and Measures.

If ever the Metric system of weights and measures comes into general use in England, few classes of people will have greater reason to welcome the change than that which is engaged in building operations. At the present time confusion reigns supreme. Not only is the system of calculating superficial and cubic dimensions—the duodecimal system—different from that adopted by any other class of the community, but units vary to an amazing extent in different parts of the country, and even in the same district when different materials are considered. Brickwork in walls, for instance, is, in the London district, measured by the "rod" or "perch," of 272 square feet, being reduced to a uniform thickness of 1½ bricks; but in some parts of the country it is measured by the square yard, the thickness being stated, and when in bulk, as in railway bridge abutments, is almost always measured by the cubic yard. On the other hand, slating is measured by the "square" of 100 square feet, while a "thousand" of slates means twelve hundred, a thousand bricks being only a thousand nett, and a "thousand" nails being but nine hundred; and the various market sizes of slates are given fancy names, such as "Rags," "Queens," "Duchesses," "Countesses," and "Ladies." Wall paper, again, is measured according to a standard of its own, the unit being the "piece" of nominally 12yds. long (actually rarely more than eleven) and 21in. wide where English papers are concerned, though a "piece" of French paper is only 7yds. long and 18in. wide. Then, whilst most metals are reckoned according to their weight, zinc is measured according to its thickness to the Birmingham wire gauge. Glass is treated analogously, for while sheet glass is known by its weight per foot super, plate glass is known by its thickness in fractions of an inch. Baltic timber, when imported, is sold by the St. Petersburg "standard," which is cubically equivalent to 120 deals, each 12ft. long, 11in. wide, and 1½in. thick; but when used in buildings the cubic foot is the unit most commonly adopted for carpentry work, though custom varies much in different places. A "load" of timber, too, contains only 40 cubic feet of rough and 50 cubic feet of hewn. After all, however, it is in materials connected with plastering that confusion is most rampant; hair, for instance, being measured by the pound, laths by the bundle, cement by the bushel, cement mortar by the hod of half a bushel, lime and sand by the cubic yard, and mixed plaster by the sack. More than that, each of these measures varies with local custom. In the north-eastern counties hair is sold by the vague "bag," and in other parts laths by the "load" and by the thousand feet run, while a "bushel" of cement is smaller than the standard bushel, a cubic yard containing twenty-three instead of twenty-two. As for lime, the methods of its measurements are infinite, the "chaldron" being a somewhat favourite unit, presumably because nobody knows exactly what it means, some authorities saying that it contains 32, others 36, and others 48 bushels; but "quarters," "hundreds," "sacks," and even "hogsheads" or "cider casks" are all recognised measures for lime in different localities. The need for reform is urgent, but it cannot be looked for until some generally recognised and inter-related system of weights and measures, such as the metric system, is introduced compulsorily; for the majority of those engaged in the building trades are ultra-conservative in their customs, not being highly educated men like the analytical chemists, who were able to voluntarily effect the change to the metric system when once they recognised its advisability.

G. A. T. M.

On Reflection.

Clerk of Works and Workmen.

The duties of a clerk of works, or of an architect who acts as his own clerk of works, are often of a difficult and delicate character, but if all builders' labourers conducted themselves after the pattern of one John Thompson, whose case was lately disposed of at the Uttoxeter Petty Sessions, these duties would be fraught with more danger to life and limb than the leading of a cavalry charge. Mr. R. W. G. Hayward, architect, of Nottingham, who has been superintending the work of enlarging a school at Abbotsholme, appears to have a standard of workmanship that does not coincide with that of John Thompson. He was unreasonable enough to insist that the work under his charge should be properly done. For this offence he was assailed with abusive and threatening language, and was even waylaid by the redoubtable Thompson, knocked down and severely kicked. The sentence of two months' hard labour passed by the bench disposed satisfactorily of the principal actor in the brutal business; but if the statements made in court that the prisoner was merely the tool of the foreman are true, the latter ought not to be allowed to escape scott free. The state of things at these works would appear to be about as bad as it is possible to imagine. Two of the other workmen who witnessed the assault are stated to have made not the slightest effort to prevent it. The clerk of works seems to have been regarded as the common enemy, though for no other reason—as far as we can learn from the report that reaches us—than that he sought to do his duty and see that the work under his supervision was efficiently carried out. The case suggests the enquiry whether some sort of disciplinary action on the part of the trades unions to which, presumably, the men belonged, would not be possible and desirable. The unions are very keen to resent—and rightly so—any injustice done to their own members. It is time that some attention were directed by trade union leaders to the problem of how to impress workmen with some sense of responsibility towards their employers. We do not believe—although the charge is often made—that in a general way the unions encourage shirking and bad workmanship, but it would have a salutory effect if such conduct as that of these workmen at Abbotsholme were distinctly reprobated by their fellow members and branded with something of the ignominy which attaches to the "blackleg."

London's New Street: A Suggestion.

The new Strand-to-Holborn thoroughfare, about which so much has been heard, naturally affords a first class opportunity for all who have any special ideas as to the way in which a city should be built or a road made. There has been no lack of suggestions; and that is as it should be, for an improvement of this magnitude is a very rare event in London, and it behoves anyone who has a luminous idea on the subject to make it known before the time for discussion has gone by. As might be expected, some of the ideas that have found expression are more brilliant than feasible. One suggestion, however, which strikes us as being eminently practical and reasonable is made by "The Thermostat" (a monthly journal devoted chiefly to questions of fire prevention and extinction). Our contemporary suggests that underneath the road there should be one great central conduit running along its whole length big enough to take all cables, pipes, and mains, and deep enough for the men to work in. Each house or block of houses might have an outlet by which it could be fed with gas, electricity, or water, and there could be man-holes to admit workmen. The adoption of such an arrangement would obviate those exasperating blocks, which we know so well, whenever a portion of the street is "up." Any additional initial expense which such a method of construction might involve would soon be more than repaid in the saving effected by the cessation of the constant taking up of the road surface whenever a gas pipe has to be repaired or a leak found in a water main.

The Trade Union Congress.

There are various opinions as to the importance and influence of the Trade Union Congress, which has been meeting during the past few days at Plymouth. While it is unjust and foolish to regard the recorded resolutions of the elected representatives of upwards of a million workmen as the vapourings of windy and irresponsible agitators, it is perhaps scarcely more reasonable to give to them the dignity of a programme of reform on which the workers of the country are likely to unite to bring to a successful issue. Many of the resolutions were mere pious opinions which have no driving force behind them, and to the realising of which probably few of the delegates would be willing to devote a single hour's hard work. That is a criticism, however, which does not apply to the discussion on the important question of the Housing of the Working Classes. On this subject the delegates displayed a striking earnestness and a striking unanimity. The problem is one which presses heavily upon the workers, not in London only, but in all parts of the country. Mr. Ben Tillett's resolution on the subject was carried unanimously; it was to the effect that municipalities should avail themselves of the powers vested in them under Part 3 of the Housing of the Working Classes Act; that a rent court should be established on the lines of the land courts in Ireland and Scotland; and that improved services of workmen's trains should be established to enable workmen to live at greater distances from their work. Strongly as we object to the forcing up of rents which has been going on lately in the East-End of London, and to a less extent in other localities, we are more than doubtful of the practicability of fair rent courts; but with the other proposals we heartily agree, and we are glad to see that the workers are beginning to grapple seriously with a problem which is of such vital importance to the well-being of the community. It is somewhat remarkable that one solution of the problem—the transportation of manufactories and the workers employed in them to country districts where houses might be built and let at reasonable rentals, does not seem to have found an advocate. Mr. Howard's scheme of "Garden Cities," to which we recently referred, or the less ambitious and actually realised project of such model villages as Port Sunlight, suggests to our mind the lines along which a solution of the problem may most hopefully be sought.

Back Numbers of the Builders' Journal Wanted.—The publisher would be much obliged if readers who may have by them any copies of Nos. 105, 106, 107, and 108, dated February 10th, 17th, 24th, and March 3rd, 1897, of the BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, which they are able to spare, would kindly send them to him, as these are required for office purposes. A copy of the current number of *The Architectural Review* will be sent as an acknowledgment of the courtesy.

WITH GREEK BUILDERS.

By JOHN A. MARSHALL.

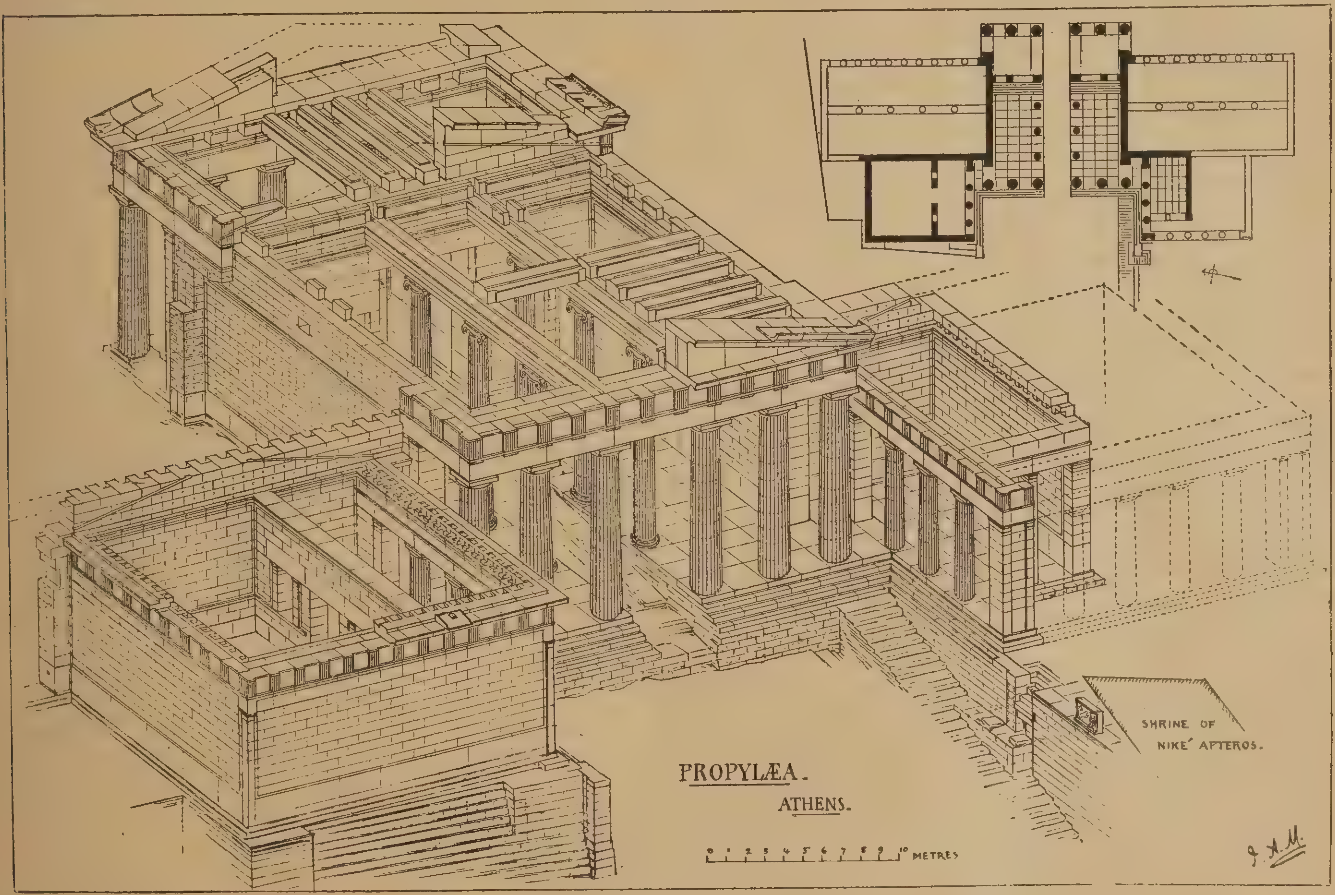
(Continued from page 55, No. CCXXXVIII.)

III.—THE PROPYLÆA.

> *"Thou dost hover o'er thy grave all glowing, genius!"*—Goethe.

To follow, in fancy, the steep ascent, and pass through the gateway of the Acropolis at Athens, is the delight of all students interested in the world's noblest architecture.

For the present, we will linger at the portal; and certainly no better example could be selected to serve as a basis for our further enquiry into the structural details of Grecian architecture.



PROPYLÆA. ATHENS.

It will scarcely be necessary to explain that the idea of this building is an elaboration of the simple Propylæa of prehistoric times, as exemplified at Tiryns and Hissarlik, whereby the enclosure was approached through two vestibules, one outside the gateway and the other inside, towards the enclosure; the entrance was thus made more imposing, and convenient places of shelter were provided for persons waiting to enter or leave the precincts of the citadel.

Such a gateway, of modest pretensions, had once occupied the site of the present building at Athens, but when the grand opportunity arrived, under Pericles, the old gateway had to give way for a structure more in keeping with the later phase of Grecian magnificence.

In his finely conceived plan, the architect, Mnesicles, proposed to mask the whole western end of the Acropolis, by grouping around the gateways additional apartments, thus extending the building on each side of the entrance, as far as the confines of the rock. The primary motive for the disparity in plan of the two vestibules was, no doubt, the central avenue of columns, which was made far more impressive by extending the depth of the outer vestibule, while spacious and cool retreats were at the same time afforded in the side aisles; the inclined way was also made more easy, and the breaks in the levels of the building were made less prominent.

To enclose the western end of the Acropolis, and to retain the higher ground on the inside, the vestibules are flanked by boundary walls, which are utilised for the additional apartments built against them. On the outside, bastions, faced with masonry, jut out from the rock to receive the lateral apartments or wings which enclose the approach, and thus obviate any unpleasant impression which might otherwise have been produced by the gap in the centre of the stylobate. Flanking the inner vestibule, on the higher level, it was originally intended to build two large halls or stoæ, and although this intention was never carried out—the works being suspended on the outbreak of the Peloponnesian war, 431 B.C.—yet evidence of it remains in the commencement of the front wall or colonnade.

The indications of the arrangements for roofing the group of buildings thus contemplated and partly carried out, are most interesting, the only other instance remaining of the fifth century B.C., at all approaching the Propylæa in complexity of arrangement, being the Erectheion, on the same Acropolis. In both buildings each block is roofed separately, and the idea of intersecting one roof by another is quite naturally avoided by the differences in height of the several apartments, and in the levels of the site.

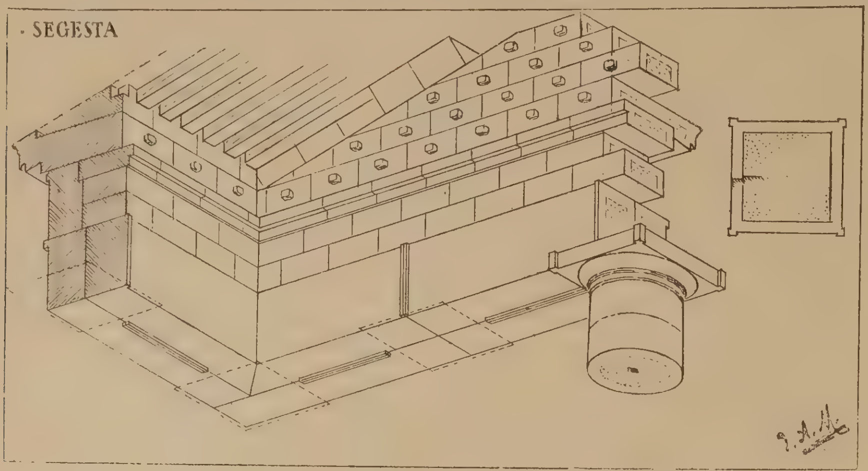
At the Propylæa, it will be seen, on referring to the diagram, that the side walls of the vestibules are thinned on the outside so as to form breaks, with the object of stopping and returning the members of the entablature clear of the roofs of the proposed halls or stoæ; these breaks also serve to receive the eaves cornice of the lower vestibule where it abuts against the frieze of the higher. It only remains to add—in connection with the general arrangements—that the southern wing, which is incomplete, differs somewhat in design from that on the north. The purpose of this variation was probably to provide an approach from the Propylæa to the precints and shrine of Niké Apteros, which stands on the spur of rock in front.

Having now taken a general survey of the structure we will examine the construction more carefully in detail. Beside the evidences of incompleteness above referred to, there are other indications, to be seen in the unfinished character of the surfaces of the walls throughout the building. Like the steps and paving of the stylobate, the general surface of the walling is left in a rough state, but it was necessary—as for the steps—to define the finished face at all internal angles, whether formed by walls or antæ, also under cornices and above the projecting orthostatæ or base stones. Thus there is a draft or sinking all round each wall, leaving the intermediate portion standing out as a raised panel to be worked off later. This draft would not only serve as a guide to the mason in cleaning off, but it allowed of the immediate completion of cornices, and the caps of antæ, and facilitated the proper bonding of the stones at internal angles. A similar draft was also worked vertically in the angles where the steps of the stylobate break forward for the wings.

It may be noted that in jointing the plain walling blocks the front edges are left free to the depth of that portion intended to be worked off; this is done by cutting a bevel on the bottom bed of each course, and on one side of each vertical joint. The purpose of this was to reduce the risk of the stones being chipped during fixing, and to avoid the unnecessary labour of working a fine joint where it was not required.

The blocks are coursed in equal heights of about 1ft. 6in., and they pass through the full thickness of the wall. The orthostatæ course, which is in two thicknesses, rests on a guiding course, or sub-plinth, 9in. high, laid on the top of the foundations.

In cutting down the faces of the walling stones and steps from the rough block it was customary to leave a projecting boss or knob in the centre of the front and back of each stone. We are not sure that the exact purpose of these knobs has been ascertained, although it has been suggested that they may have served to facilitate the moving of the stones. At Assos, where the stones forming the steps of the stylobate vary in length, there are sometimes three or four knobs on



one stone. These projections were eventually worked off the walls, but at the Propylæa they may still be seen on the outside of the walls against which the halls or stoæ were to have been built. On parts which were not visible they were permanently retained, as between the ceilings and roofs of the small wings, also at Segesta on the back of the pediments, and at the Erectheion, on the walls of the eastern apartment, under the floor level.

In considering the beds and vertical joints of the walling stones, it should be remembered that mortar was not used, and, indeed, it would have been quite unnecessary as a cementing material; the stones being large and passing through the wall, stability chiefly depended on vertical pressure and extreme accuracy in the jointing. The stones were, however, united horizontally, by H shaped iron clamps, let into the top, and run with lead, and sometimes also vertically by iron dowels. The top and bottom beds were finished as true planes, so that the stones had a solid bearing throughout; the margins are quite smooth, while the intermediate parts show faint traces of a finely toothed chisel; it is evident, therefore, that in the first instance the margins were left a little in advance of the rest of the bed, and rubbed down afterwards, until they reached the general level. The vertical faces have also rubbed margins, but here the intermediate part is very roughly tooled, and sunk below the rest; in this case it was unnecessary to work a true plane throughout. In the British Museum the student will find stones from this and other buildings, showing the different degrees of execution adopted in working the beds and vertical joints. In some cases the marks produced by each stroke of the clawed chisel are so clearly defined that the size of the implement can be easily ascertained. A few years ago the sections at the Museum were "well exposed"—as geologists say—but the restorations in plaster have rendered many of them inaccessible.

Respecting the jointing of the columns, we cannot do better than quote Dodwell's description in his "Travels in Greece." He says: "Each corresponding frustum contains a hole or mortice, 4in. square and 3¼in. in depth; each hole is filled with a piece of squared cedar wood, fitted exactly into the two contiguous mortices. The centre of this square piece is perforated for the purpose of receiving another piece of cylindrical form. This was probably not designed to give any additional strength to the interior of the blocks, but to serve as a centering on which to turn the upper block in order to ensure a coincidence of the flutings, for it is likely that the flutings were begun, or roughly sketched, before the masses of the columns were placed upon each other, and that they were finished afterwards. The cylindrical inner piece of wood (or pin) was worked exactly true, and evidently turned by means of a lathe; it was hermetically closed between the blocks, and accordingly preserved without the smallest injury. The two outer bits were painted red. The columns of the Parthenon and of other Grecian temples are, no doubt, united in the same manner, for the blocks which have fallen down have the square hole on the surface, for the reception of the wood, similar to those of the Propylæa. A similar expedient has also been found at Thoricus and Agregentum." One of the wood sockets from the Propylæa is in the Bronze Room of the British Museum, and a pin which fitted the perforation is, we believe, in the possession of the Royal Institute of British Architects.

Mr. Penrose, in describing the jointing of the columns of the Parthenon, agrees with Dodwell in thinking that the purpose of the wood sockets and pins was to provide a pivot on which to turn the drums, but he believes this was done to ensure a finer joint by grinding the stones together, and not merely with the object of making the setting-out of the flutings coincide. From unfinished remains, and from the Erectheion inscriptions, we know that the fluting of columns was one of the last operations in finishing off a building. The drums were superimposed as plain blocks, with projecting knobs, or ancones, on the circumference, by which the stones could be raised and turned with the aid of ropes. We are not aware that such knobs have ever been found on a column *in sitû*, but they may be seen on several unfinished drums, discovered some years ago on the Acropolis close to the Parthenon. Instances of columns blocked out, preparatory to fluting, remain at Segesta, Delos, Rhamnus, Thoricus, and the early temple at Sunium; in all these — Segesta excepted—the finished flutings are commenced for a few inches at the top and bottom.

At the bottom the flutings were no doubt finished before the drum was placed, and they are kept clear of the stylobate by a circular seating, worked on the bed of the drum. These seatings, or scamilli, prevented the arrises of the flutings being fractured during the operation of placing the stones, or by unequal pressure at any future time; they were also convenient places in which to make the adjustment for the inward inclination of the axis of the columns, an artistic refinement observed in all the buildings on the Acropolis of the fifth century.

At Rhamnus, where the columns of the peristyle are all left in block, it is interesting to find, in the two columns of the pronaos, that the front flutings are finished, while at the back of the same columns they are left in the preparatory stage of straight planes.

In working the beds of drums, the bearing parts are generally slightly reduced in area by roughly sinking a portion of the surface, so as to leave a smooth outer margin and a central disc as the rubbing parts; the turning of the drums on the pivot was thus more easily accomplished, and the circular sinking served as a receptacle for the marble dust occasioned by the grinding process. (See a drum from an Ionic column in the British Museum.)

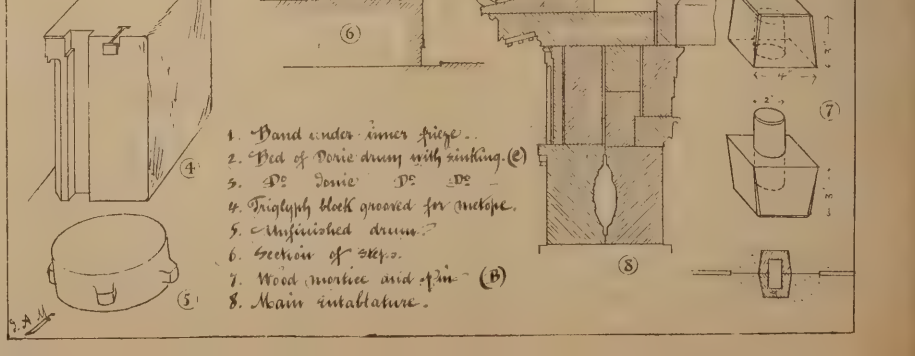
As mentioned in a previous article, raised circular seatings are left on the paving stones at the Propylæa to receive the bases of the Ionic columns. The object of these seatings was not so much to protect the mouldings as to keep them clear of the rough surface of the paving.

The delicate base mouldings of the Ionic temples of Asia Minor were often raised above the level of the paving on low square blocks; but this precaution was not so necessary for the Ionic base of Athens, where a large torus generally takes the place of the delicate beading of the Asiatic base, therefore there is no intervening plinth at the Erectheion, the shrine of Niké Apteros, and the temple on the Ilissos (now destroyed).

To prevent fracture, the Asiatic base was always worked with a disc on the bed—like the bottom drum of Doric columns—so that the outer edge was kept free.

To provide continuous support over the various colonnades for the ceilings and pediments, the inter-columniations were bridged over by stone beams, termed by the Greeks an epistylia. For the Doric porticoes these beams are in two thicknesses, and hollowed out in the middle to reduce the weight and thus facilitate the hoisting. By dividing the beam the risk of failure, through natural defects, was reduced, for in single blocks of large scantling the presence of flaws was not always apparent. The detection of such flaws was one of the most onerous and difficult duties of the architect, and is supposed to have been done by sounding the block with a hammer.

At the Parthenon, where the epistylia or


PROPYLÆA. ATHENS.
For lewis
For frieze
B
C
①
②
③
④
⑤
⑥
⑦
⑧
Similar draft around walls.
4"
3"
2"
1. Band under inner frieze.
2. Bed of Doric drum with sinking. (C)
3. Do Ionic Do Do
4. Triglyph block grooved for metope.
5. Unfinished drum.
6. Section of steps.
7. Wood mortice and pin (B)
8. Main entablature.
J. A. M.

architraves are generally in three stones, the middle stone has but little weight to sustain beyond its own, and merely serves to fill up the gap and ensure a uniform soffit. This may account for the inferior quality of the marble, which, we are told, was used for these interior sections, as compared with that employed for the weight-sustaining outer sections.

In working the longitudinal joints for the Doric architraves of the Propylæa, the middle portion of each section was roughly hollowed out, leaving only a narrow strip along the top and bottom as the bearing parts. The labour was thus greatly reduced, and a more accurate adjustment of the contiguous surfaces was more likely to be obtained. The sections were converted into a single beam by clamping them together on the top at intervals with H-shaped iron clamps. The ends, of course, abutted over the middle of each cap, and at the angles of the peristyle the joint of the outer portion was always on the flanks. At the internal angles the beams were mitred, so that each return had an equal bearing on the abacus of the cap.

In large Doric temples, where the architrave is sometimes made up of three thicknesses, the beams at the angles are generally in two only; this gave increased strength where most required, and allowed the guttæ and regulæ under the angle triglyph to be entirely worked on the end of the outer stone. At the temple of Zeus, Olympia, where the architraves at the angles are in three thicknesses, like the rest, the joint in the flanks cuts through the middle of the guttæ, and the sections of the architraves vary in thickness, but these irregularities were concealed by a thin coating of very fine stucco.

For the portico of the pseudo-Doric temple at Samothrace the architrave was in two equal thicknesses; but at the angles a wider stone was used for the outer section, so that the return gutter could be worked on; and to make the joint on the soffit agree with the others the stone was reduced in thickness at the back to within 18in. of the return end.

To prevent fracture during the operation of placing the epistylia, and also in case of unequal settlement, it was cutomary to cut down the outer margin on the top bed of the abacus of the cap; a raised seating was thus left, on which the ends of the epistylia were bedded, free of the outer arris. This precaution was especially necessary for the early or archaic Doric cap, the extreme projection of which would, in case of unequal pressure, tend to produce a lateral strain on the column. In the fully-developed Doric cap, where the echinus is not so pronounced, and the transition from the shaft to the abacus more gradual, the liability to fracture is lessened, so the scamillus was brought nearer to the edge of the abacus.

To avoid flushing or chipping at the joint between cap and column, due to strain on the cap, the outer margin of the bottom bed of the cap is also kept free, and the arris of the joint is bevelled—sometimes this is emphasised by additional V-shaped sinkings, or annulets—both above and below the joint.

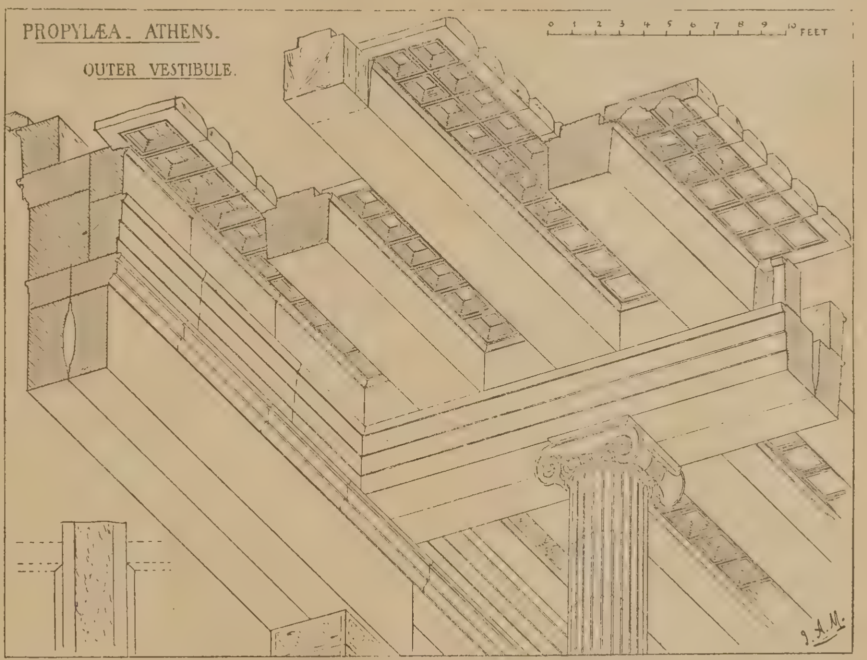
In the Ionic type the joint between cap and column was invariably above a bead worked on the column, but the same precautions were taken at the bottom and top of the cap to keep the edges free.

Another expedient of a temporary character to prevent the chipping of the angles while the stones were being placed has yet to be mentioned. At Segesta, where building operations were suspended at an early stage of the work, projecting fillets or pads are left at the four angles of the abacus of each cap, and along the joints of the architraves; the latter are in two thicknesses, and in the case of the longitudinal joint on the soffit, the fillet is stopped at the caps, so as not to interfere with the bedding of the stones. On the outer face, the fillets which protected the vertical joints have been worked off, but at the back they still remain (see diagram).

Unlike the Doric, the Ionic type of architrave seems to have had its origin in a wood prototype of thin sections superimposed flatwise, and increasing in width towards the top, to protect and conceal the joints; yet the groove or panel on the soffit suggests that the lower portion of the beam consisted of two pieces on edge, placed a few inches apart. When this type was translated into stone, the panel was often enlarged and enriched with mouldings, and the joints on the soffit were omitted. (See the remains of the later temple at Ephesus in the British Museum.) The stones composing the architraves of the mausoleum are laid flatwise, and the soffit has a simple groove. (See restoration in Museum.)

So far as we know, the sinking on the soffit is confined to Ionian buildings on the western coast of Asia Minor and the outlying islands; most, if not all, of these examples are of later date than the buildings on the Acropolis at Athens, and though their distinguishing characteristics were, no doubt, based on archaic prototypes, yet the Athenian architects in their fusion of the Doric and the Ionic, invariably omitted the panel, and, in the case of the Propylæa, resorted to a longitudinal joint on the soffit of the Ionic architrave. The respective proportions of the two orders was, however, maintained, and considerable skill is shown at the Propylæa in reconciling the differences.

On the level of the top of the Doric architrave, a moulded band is carried around the interior of the outer vestibule to serve as a plate for the ends of the Ionic architraves, and the facia of these architraves is also continued around the walls as a frieze, on which rest the ends of the ceiling beams. Two stones of the band, or plate, are in the British Museum, and are interesting, as showing the lewis holes for hoisting, and the places for inserting the H-shaped iron clamps and the dowels. A similar band is carried around the inner portico, above the Doric architrave, but there is no internal frieze, so the ceiling beams in this case rest on the band.



The stone ceiling on the Propylæa was probably the finest in all Greece, the only competitor, which runs it close, being the north portico of the Erectheion. In both, the greatest span is 19ft., and the length of the longest beam about 22ft. At the Propylæa the beams were 2ft. 9in. by 2ft. 4in. in section, those over the side compartments of the outer vestibule weighing about eleven tons each. Every precaution seems to have been adopted to restrict the weight of the ceiling; the deep coffers of the lacunaria stones contributed to this object, besides serving as an adornment, and the weight was still further limited by roughly cutting away the angles of these stones at the top. The beams were placed about 3ft. apart, and the facia was returned at the ends of each space by fitting in a thin slab. At the angles the mouldings and inclined facia are mitred, and all projecting mouldings throughout were relieved of the weight of the beams and lacunaria stones by a slight sinking, or draught, along the top.

The lacunaria stones were narrow slabs about 18in. wide, laid in rebates cut along the top of the beams; at the tranverse joint the slabs were rebated to overlap, which gave additional security in case of fracture. On the soffit these joints are concealed by a raised bead around the coffers. The ceilings of the small wings were entirely of wood, the ends of the beams being let into notches cut out of the back of the corona stones. The roofs of these wings were hipped in front, and notches were cut on the top of the corona stones for the feet of the rafters. At the back the roofs abutted against the boundary walls, in which chases are cut to receive the tiling.

The northern wing is exceptionally interesting on account of the windows in the division wall. The projecting cills of these windows are continued round the room as a string, and the jambs are treated as antæ. This method of finishing the ends of walls and external angles by slight pilaster-like projections was universal in Greek work, and probably had its origin in the wood posts which were placed in similar positions in earlier times, to sustain the walls of sun-dried brickwork, and to stop the plastering; evidence of this was met with at the pre-historic palace of Tiryns.

The influence of timber construction on design in stone is also apparent in the Doric frieze, where the triglyph blocks, no doubt, represent the ends of wood beams resting on the architrave, while the metopes represent the panels which were fitted into grooves cut in the sides of the beams to fill up the intermediate spaces. In timber construction these spaces were probably sometimes left open, and in the case of temples in antis, some of the metopes may have been fitted with shutters. Euripides, no doubt, had something of the sort in his mind when he made Pylades notice the open space between the triglyphs by which he and Orestes could enter the temple of Diana at Tauris.

In large buildings the metope slabs, whether sculptured or not, were generally let into grooves, cut in the sides of the triglyph blocks, as at the Parthenon and the Propylæa, where they serve as a casing to the rough intermediate backing stones; but for the temple of Zeus, Olympia, the metopes for the frieze of the peristyle were massive blocks, of about the same thickness as the triglyph blocks, and the latter were rebated to overlap the metopes in front. Where the metopes were sculptured—in front of the pronaos—the slabs were let into grooves.

For smaller buildings the frieze consisted of stones, each of which comprised a triglyph and a metope; the triglyph end of each block was then rebated to receive the metope end of the adjoining block. This method was adopted for the small wings of the Propylæa, the temple at Rhamnus, the Metroon at Olympia, &c. The stones composing the frieze were generally dowelled to the architrave, and secured to each other by iron clamps. On the top they were steadied and protected by the broad stones of the corona or cornice, which afforded an even bed for the roof.

(To be continued.)

PARIS FLATS.

By A. ANDERSON.

THE past few years have witnessed a tremendous evolution in the construction of the flat in Paris. Architects have been put on their metal, have borrowed suggestions here, there, and everywhere, and, it must be confessed by every impartial observer, have amply justified the proverbial reputation of their nation for ingenuity. Nowadays, what is known as "confort moderne" is a *sine qua non* with every tenant. The expression is held to include abundant light and air, a plentiful supply of fresh water, bathrooms and dressing-rooms fitted up by the landlord with all necessary appliances, lifts, luxuriously furnished halls and carpeted staircases, electric lighting, steam heating, telephones, and, indeed, all the resources that invention has put at our disposal. In addition to this, the internal decoration of even cheap rented flats has to be carried out in an artistic manner that ten years ago would only have been seen in the houses of the very wealthy. The natural result has been that there has been a tremendous exodus going on for some time past from houses that only yesterday, it seems, were looked upon as models of everything that was desirable, and in many erstwhile fashionable thoroughfares the ticket, so ominous in the eyes of the landlord, "A Louer," protrudes from every doorway, eloquent testimony to the attractions exercised by "confort moderne" somewhere else. The average rent of one of the new pattern flats in the more fashionable residential quarter of Paris, within a certain radius of the Champs Elysées, may be put down at from £60 to £85 per annum for flats containing four or five rooms, up to £200, £300 and £400 for those containing ten or a dozen or more rooms. There are, it is true, a certain number of flats to be found in Paris, the rents of which run as high as £600 and even £800, the record price, but they may be almost counted upon one's fingers and are built in specially favoured positions.

In the more outlying portions of the fashionable quarter "confort moderne" may be exacted by the tenant ready to pay a rent of £50 or even £35, while in the suburbs the minimum price of comfort may be put down at £25 and, in some instances, even less.

A typical flat of modern construction at moderate rental may be found in the neighbourhood of the Trocadero for example. "Found" is perhaps rather an ambiguous expression, for the flats are all let almost before the mortar is dry.

The plans, reproduced in our centre plates, by permission of the architect, M. H. Hanin, are of a house in the Rue Vineuse. The house consists of a ground floor and six upper storeys built on cellars. On each floor there are two flats, one of four the other of three rooms, each of the bedrooms having a dressing-room adjoining. It will be seen that not only can every room be entered directly from the hall, but they all communicate with one another. The servants' rooms are situated, as is usual in Paris, on the sixth floor. The rentals are from £30 to £55 per annum. This particular house has been built for about eighteen months and may be taken as a very good specimen, if not as "the last word" of its category.

LANGSETT WATERWORKS.

VISIT OF SHEFFIELD ARCHITECTS.

SOME forty to fifty members of the Sheffield Society of Architects and Surveyors visited the works of the new Sheffield reservoir at Langsett on the 2nd inst., on the invitation of Mr. E. M. Eaton, C.E., the consulting engineer to the Corporation, who is responsible for the scheme. The various features of interest were ably explained by Mr. Watts, the resident engineer. The works were commenced in October, 1897. The first portion of the work inspected was the discharge tunnel, leading to the valve well or shaft. The total length of this tunnel is about 400yds. the shaft being in the centre. At this point, the supply of water will be governed by valves connected with a vertical pipe, worked by hydraulic pressure. In the well will be fixed a pipe, 43in. in diameter, which will carry away the water for consumption, subsequently supplying other pipes for the needs of the citizens of Sheffield, and also to meet the compensation claims. In connection with the valve well, it may be interesting to state that the total capacity of the reservoir is 1,400,000,000 gallons, and the maximum discharge will be about 70,000 cubic ft. per minute. The springs of water have been a source of many engineering difficulties in the construction of the foundations. Retracing their steps through the tunnel, the party returned to the surface, where Mr. Eaton and Mr. Watts showed the extent of the reservoir, the area being 120 acres, and the greatest depth 100ft. Another descent was then made deep into the earth; after going down a number of ladders, the party found themselves at the bed of the embankment, which is to stretch 400yds. across the Don Valley in order to dam up the water. The average depth of the embankment will be 85ft.; at one point the depth will be 119ft., this being its deepest part. The excavation of the trench has been practically completed. Concrete is being used; the difficulty with the springs has been overcome, and the work is proceeding expeditiously, although every care is being taken in order to ensure the stability of the dam. Concrete will be carried to within a few feet of the surface. At the base the embankment will be 630ft. wide, and at the top 28ft. When the surface was again reached, the gathering ground comprised in the 5,200 acres belonging to the Corporation, and the many ways in which the spot has been endowed by Nature as the source of a great water supply were described. It is hoped that the reservoir will begin to fill in four years from the present time. After an inspection of the plans of the work in the engineer's office, the party were entertained to tea by Mr. Eaton. In referring to the character of the work at Langsett, Mr. Eaton alluded to the bursting of a reservoir at Dale Dyke. He said that catastrophe was not owing to bad workmanship, but to a slip of the bank. The ground sprung and the puddle was unable to sustain itself. At Langsett every precaution that experience could dictate was being taken in order to make the embankment the most stable of its character in the kingdom.

Deptford Loan Picture Exhibition.—The loan exhibition of pictures which had been held at Sayes Court, Deptford, during the previous fortnight, closed last Sunday week. During the time the exhibition was open, there were upwards of 12,000 visitors. The highest number in one day was 1,591, and the lowest 554.

A Vicar Painting his Church.—The vicar of St. John Baptist Church at Spalding, the Rev. C. W. Macdonald, M.A., is now engaged in painting the exterior of his church and schools. They badly needed a coat of paint, but there were no funds available, whereupon the vicar himself undertook the task. He has already spent between four and five weeks upon his self-imposed contract, which he hopes shortly to complete.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.

To the Editor of THE BUILDERS' JOURNAL.

LIVERPOOL.

SIR,—As I am desirous of becoming a member of the Builders' Foremen and Clerks of Works' Institution, I would esteem it a great favour if you would be good enough to inform me to whom I should make the necessary application.—Yours, &c., J. L. J.

Application should be made to the Secretary of the Provident Institution of Builders' Foremen and Clerks of Works, 9, Conduit Street, Regent Street, London, W.

SHAVINGS AND SAWDUST AS FUEL.

To the Editor of THE BUILDERS' JOURNAL.

SHREWSBURY.

DEAR SIR,—I make a great deal of shavings and sawdust, and although I have a steam engine, cannot use them for fuel. The draught in the engine draws the material up the chimney only partially burnt and causes a nuisance to neighbours. I should be glad to know how to remedy this. Details of how to make fire-lighters from shavings and sawdust would oblige. SAWDUST.

To use shavings and sawdust for making steam requires a large firebox to the boiler and a split firebrick bridge, that is, the bridge made with a cavity right across like a double brick wall, with inlet below the firebars so that a good supply of air can be obtained at this point without passing over the fire, the draught being regulated by a flap door over the inlets. For machinery for the manufacture of fire-lighters from pressed sawdust, apply to such a firm as Yeadon and Co., Albion Place, Leeds, or the Universal Patent Fuel Machine and Manufacturing Co., Ltd., 32, Fenchurch Street, London, E.C.

HENRY ADAMS.

SURVEYORS' INSTITUTION EXAMINATIONS.

To the Editor of THE BUILDERS' JOURNAL.

LONDON.

SIR,—Will you kindly inform me through the columns of your valuable journal which books I should require to work up for the Surveyors' Institute examination, and which courses of lessons will be best to take up, say, at the Polytechnic, during the coming winter evenings for the same examination.—Yours, &c. W. H. E. L.

It is best to adhere to the list of books published in the Syllabus of Examinations, obtainable from the Secretary of the Surveyors' Institute, 12, Great George Street, Westminster, S.W. If entering in the "Building" Section, a good class on quantity surveying should be attended during the winter, where the fees are not so low that the class becomes overcrowded. The lectures at University College promise to be good. Land surveying must be learnt practically.

G. A. T. M.

STONE CHURCH, KENT.

To the Editor of THE BUILDERS' JOURNAL.

MANCHESTER.

SIR,—I should like to inquire whether you can tell me in what book I could find any particulars relating to Stone Church, Kent. I have a short description of it to write, and cannot get any particulars of much service.—Yours truly, ENQUIRER.

[Perhaps some of our readers can oblige with this information.—ED.]

ROAD-MAKING AND EXAMS. FOR SURVEYORS.

To the Editor of The Builders' Journal.

Walthamstow.

Sir,—As a constant reader of your valuable paper, will you kindly inform me in the next issue of the paper what you consider the best books to obtain on the construction of roads; also where to get information as to the examinations for road surveyors. Thanking you in anticipation.—Yours, &c., A. T. B.

The section of "Road-Maker" in "Specification" (published at these offices, price 5s.) will probably give what you require. Some articles on road-making will shortly appear in our columns. With regard to examinations, apply to the Secretary of the Incorporated Association of Municipal and County Engineers, 11, Victoria Street, S.W.

ARCHITECTURAL DESIGN.

To the Editor of The Builders' Journal.

Brighton.

Sir,—I shall be glad if you can inform me through your valuable journal of a book on architectural design, as I am shortly joining a class at the School of Art here.—Yours, &c., "PUPIL."

The best book you can have is Fletcher's "History of Architecture," published at 12s. 6d. This can be obtained from Mr. B. T. Batsford, of 94, High Holborn, London, W.C., post free for 10s.

COLOURING OF ARCHITECTURAL PERSPECTIVES.

To the Editor of The Builders' Journal.

Longton.

Sir,—Will you kindly inform me if there are any books published on the colouring of architectural perspectives in water colours?—Yours, &c., J. F. J.

Possibly some useful hints might be gleaned from Spier's "Architectural Drawing" (B. T. Batsford, 94, High Holborn, W.C.); but as a matter of fact each draughtsman must develop for himself, though a few personal lessons from a good art master might be advisable. Many commence by covering the whole surface with a light wash of yellow ochre and then follow on rapidly with local colour while the paper is still damp. This colour should be applied of full strength at once if there is to be vigour in the result, a dry cloth and the penknife being useful aids for the retention and production of high lights, while shadows may be applied with a soft pencil or dense sepia. Some men confine themselves entirely to the use of yellow ochre, cold sepia, light red, and indigo, obtaining all other tints by mixing; and many others draw in their outlines in brown ink. G. A. T. M.

WEIGHT OF ROOFS.

To the Editor of The Builders' Journal.

Leeds.

Sir,—Can you give me any particulars with regard to the weight of various roofs, I mean calculating the weights, &c.? If an iron joist was inserted, how much weight would you reckon for the roof, that is for slated roofs, zinc roofs, &c.? Do you allow 1cwt. for each square foot of roofing when slated? Also, what should be added on for snow and wind pressure, and how would you allow for glass and iron roofs? I should be glad if you know of any books on the subject named.—Yours, &c., B. G.

The permanent load on a roof consists of the weight of truss, with purlins, rafters, and roof covering, together with ceiling, lantern light, skylight, &c., if any. The temporary load consists of snow and the effect of the wind. The loads per square foot of roof surface, as given in the writer's "Practical Designing of Structural Ironwork" (Spon, 8s. 6d.), p. 173, are:—Countess slating, 8lb.; slate battens, 1½lb.; slate boarding, 2½lb.; common rafters, 3lb.; snow, 5lb.; wind (average vertical load), 30lb.; purlins and trusses (iron), 7lb.; purlins and trusses (wood), 10lb.; or, say, 56lb. per foot super of sloping surface, or 60lb. per foot super of horizontal area covered. Lead covering may be taken to be the same weight as slating, zinc one-fifth, corrugated iron one-third, and tiles double the weight of slates. Part IV. of "Notes on Building Construction" (Longman, 15s.) gives tables of weight of roofs and roof coverings. A lath and plaster ceiling with joists weighs about 11lb. per foot super. An ordinary skylight weighs about the same as the slating displaced. HENRY ADAMS.

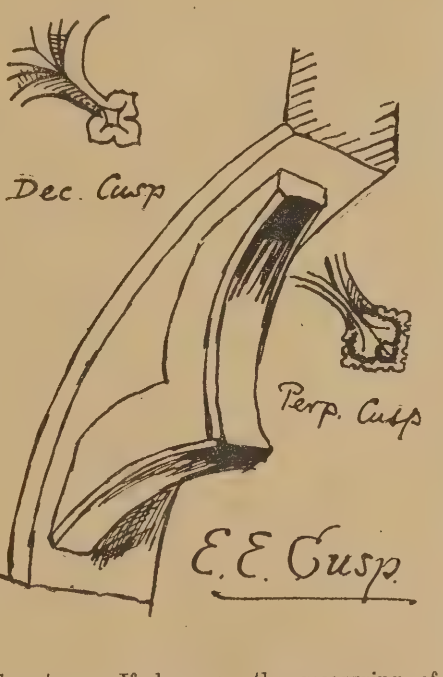
MEASURING UP CUSPING.

To the Editor of The Builders' Journal.

Nottingham.

Sir,—Could you kindly inform me how to measure up cusping, and the difference between E.E., Dec., and Perp. cusps? Is there any work from which I could get particulars? A. S.

In quantity surveying, cusps would be measured up by numbering them as "extra only" for labour involved above the cost of the stone. If, however, the measuring of cusps in an old window, for the purpose of making a drawing of it, be meant, this would be accomplished by fixing the positions of the main points, horizontally from mullions and vertically from sills, by means of plumb-bob and rule. E.E. cusps generally spring from the flat soffit of the arch, while those of the later periods are in continuation of chamfer mouldings, being distinguished by the ornamentation of the terminals. See Parker's "Glossary," and the illustration on this page. G. A. T. M.



RIGHTS OF LIGHT.

To the Editor of The Builders' Journal.

Walham Green, S.W.

Sir,—Will you inform me whether in rebuilding a wall that has at the present time an existing ancient light I could increase the size of this light (a portion of the new light being exactly in the same position as the old one) without prejudicing the right of the entire light, or could only the increased portion of the new light be blocked up?—Yours, &c., H. F.

The light can be enlarged without prejudicing the right to the ancient light. The increased portion only can be blocked up. Great care should be exercised to preserve evidence of the exact position and dimensions of the ancient light. H. P. B.

GOTHIC TRACERY WORK.

To the Editor of The Builders' Journal.

Bristol.

Sir,—Could you inform me through your valuable paper what is the best book to get information on Gothic tracery work, with price, and where to obtain same?—Yours, &c., JOINER.

We recommend "The Infinity of Geometric Design Exemplified," by R. W. Billings, with forty steel plate engravings, exhibiting upwards of 200 figures, with an introduction, 4to. cloth, nett 8s. 6d.; or "A Treatise on the Rise and Progress of Decorated Window Tracery in England," by Edmund Sharpe, M.A., with sixty-six engravings on steel, and ninety-seven woodcuts, two vols., 8vo., cloth, price 15s. nett. These books can both be obtained of Mr. B. T. Batsford, 94, High Holborn, London, W.C.

CERTIFICATES FOR MASTER BUILDERS.

To the Editor of The Builders' Journal.

Kettering.

Sir,—I am a young master builder, holding South Kensington certificates in building construction. Will some reader of your journal kindly recommend further studies?—Yours, &c., PROVINCIAL.

We should certainly advise our correspondent to obtain the Sanitary Inspector's Certificate of the Sanitary Institute. Few things inspire a builder's customers with more confidence in him than the assurance that their sanitary work will be thoroughly well done. For particulars apply to the Secretary, 74a, Margaret Street, W. G. A. T. M.

SEWER GAS.

To the Editor of The Builders' Journal.

London, E.C.

Sir,—I shall be much obliged if you will kindly answer the following through your valuable publication.

(1). What is the chemical name and symbol of sewer gas?

(2). What is its weight as compared with pure or ordinary atmosphere?

(3). If a soil pipe were connected directly to the trap of a w.c. without any fresh air inlet, would not an ordinary two gallon flush entirely destroy the "seal" by syphonic action?—Yours faithfully, TIN.

(1). "Sewer gas" is a conventional term used to denote a gaseous compound found in sewers, resulting from the putrefaction and decomposition of stagnant or flowing sewage. Every imaginable description of refuse is included under the name of "sewage," such as excreta, urine, fouled liquids, manufacturing refuse, &c., so that the actual composition of sewer gas in any sewer varies continually, according to the specific nature of the sewage passing at any particular period. Unventilated sewers permit the accumulation of sewer gas in a concentrated form, but in well ventilated sewers the gases of decomposition are mixed with large volumes of air, and the sewer gas then approaches more nearly to the character of the ordinary air of towns. The following gases are found in sewer gas, viz:—carbon dioxide or carbonic acid (CO_2); hydrogen sulphide or sulphuretted hydrogen (H_2S); methyl hydride or marsh gas (CH_4); Ammonia (NH_3); together with numerous fœtid hydrocarbon and nitrogenous vapours arising from decomposing organic matters.

(2). From the foregoing remarks it will be seen that the comparative weight density of any particular volume of sewer gas varies according to its composition, and can only be determined by actual experiment.

(3). In the case of a single w.c. connected to a soil pipe, a two gallon flush would not—under ordinary circumstance—destroy the water seal of the closest trap by syphonic action. To avoid any risk of accidental syphonage, it is desirable to provide an antisyphonage or air pipe. When two or more closets discharge into the same soil pipe, each trap should invariably be provided with an antisyphonage pipe. T. E. C.

HOUSING OF THE WORKING CLASSES.*

BY CHARLES J. HAIR, A.R.I.B.A.

I HAVE been asked by your Committee to give you my views on the housing problem. I propose to confine myself to giving you a few of the practical difficulties that are usually met with in dealing with this matter, from an architect's point of view, and the way in which they are usually overcome. The main points which an architect has to bear in mind at the outset are:—

1. *Site.*—It is generally found that the first of the new buildings have to be of a kind that will re-house the people displaced on the same area of ground, and consequently they must, of necessity, be several stories in height, in order to get sufficient air space between the different blocks. The land generally has such a high commercial value that it is impossible to make a profit by building workmen's dwellings, unless a prohibitive rent is charged for them. This has partially been overcome, in some cases, by devoting the lower part of the building to shops, and thereby getting a commercial rent for valuable frontages.

2. *Class of Dwellings.*—The next point to be considered is the kind of dwelling to erect, whether to re-house the people in lodging houses, or artisans' dwellings, and if the last named, whether they shall be "self-contained," *i.e.*, each flat a separate cottage in itself, or "associated," *i.e.*, rooms let off separately with common sculleries and w.c.'s.

Of course, one should be governed by the class of people that have been turned out, and give accommodation accordingly. Here I think I am right in saying, that up to the present it has been found impossible to get the very poorest (who are generally the class that has to be catered for) to inhabit the new buildings.

3. *Economy of Design.*—The third and perhaps the most important point to the architect, is that he must bear in mind that the buildings have to show a sufficient return to pay for themselves in thirty years, and consequently everything must be designed with a strict regard to the cubic inch; for instance if all the partition walls in a big building are made 2½in. thick, instead of 5½in. (which is the finished thickness of a 4½in. brick wall), a saving will be made of a foot in every 60ft., and in a five-storey building this means over £100. The architect must also suppress to a certain extent the artistic side of his nature and be severely practical in regard to design. As I had it very aptly put to me once, "If he must introduce 'poetry' into the elevations, it must be *very cheap* 'poetry.'" I think it is possible to make a quite plain building look well, by keeping each feature of good proportion and making a speciality of the cheaper kinds of ornamentation; for instance, broad bands of light-coloured bricks have a wonderful effect in brightening up a big building.

I now come to speak of the buildings themselves.

Lodging-houses.—First as to lodging-houses. I think this class of building is the nearest approach to re-housing the poor that has been made; this is chiefly due to the fact that everything is concentrated—there is a general kitchen, living room and scullery, common to all the inmates. The dormitories are plain, square rooms, divided off into cubicles, and have no chimneys, which are a very serious expense in other classes of workmen's dwellings. Again, the sanitary arrangements are all concentrated to one or two points. The administrative and staff quarters are the most expensive part of the building.

The first main idea for a lodging-house is a big common room on the ground floor, with dormitories above. As a working man said to me once, why not build a big shed that could be opened on one side, cover the floor with asphalte, and turn the hose on it every morning? But now-a-days we want something a little more elaborate than this; and in place of the one common room, there are dining and recreation rooms, kitchens, lavatories, bathrooms, box and locker rooms, to be provided for, to say nothing of washhouses and store-rooms, &c., for the administration of the building.

The dormitories have to be divided into separate cubicles, so that each individual has a room to himself.

This kind of building has been made to pay in London, and if it is possible to give this extra accommodation, so much the better; but I think that a somewhat cheaper scheme should be devised in the poorer districts to compete with the demand for a fourpenny doss. This can only be done by doing away with the greater portion of the administrative accommodation. I have made a rough diagram* of a lodging-house of this kind, which would accommodate ninety-six men if built two stories high only. This building is designed somewhat on the lines of existing lodging-houses in this town, though, of course, with extra sanitary accommodation. The plan is composed by placing two large dormitories forty feet apart, and planning the entrance and staircase between them. The entrance is flanked on the left by the check-taker's office (which is placed in this position so that he can supervise the entrances to the dining-room and staircase), and on the right by a cloak-room, which would be fitted with lockers for the use of the lodgers. The right wing of the building contains the dining-room and kitchen, and the left wing contains the caretaker's house and lavatories and bathrooms for the men. The w.c.'s are placed at the back, and are open to the yard, but there is a covered passage to them from the central hall. The upper floors consist of two dormitories, which are on the left and right of the central staircase. Two w.c.'s and a sink-closet are provided on each floor, opening off the staircase corridor. I propose to heat the building by means of central stoves for the dining-room and open chimney-hearths elsewhere. The baths would be heated by gas, as the addition of a boiler-house would be too expensive. I have also made no provision for a laundry, as in such a small building it would not pay. This is only a rough outline of the scheme, but I think it would be possible to make it pay at 4d. per night.

Artisans' Dwellings.—This is perhaps the most popular form of re-housing the working man, as it provides separate dwellings for each family. There are two kinds of artisans' dwellings, the self-contained and associated. The self-contained is, I believe, the most successful plan.

In connection with some dwellings which I have in hand for the Southampton Corporation, there are one or two points which I think are improvements on some of the earlier forms of dwellings. The most important is that the w.c.'s are disconnected from the living and sleeping rooms. I have often noticed that in plans of model dwellings the w.c. is put next to living rooms and bedrooms, and in some cases even between two of these rooms. The most important point to aim at in designing this class of dwelling is to get as many rooms as possible opening from each staircase. In this case there are three tenements on each floor, and each has its front door opening directly on to the landing, so that no room is wasted in corridors. In squaring out a plan for comparative cost, corridors form a big item of expense and give no return; this is a great drawback to the associated plan. These dwellings all enter through the sculleries, which is an advantage, as it acts as a disconnecting lobby between the living room and the staircase. In cases where the living rooms open directly on the staircase, complaint is often made of the noise and dust from the traffic up and down the stairs. Each scullery is provided with a sink and a copper, and has two windows, one opening to the staircase. The coppers are set in the chimney breasts with the flues on either side; this is done for economy of space, and also to provide a steam flue to carry off the steam when the coppers are in use. The same flue is used for steam and smoke, but is furnished with a damper so that the steam is only admitted to the flue when required. The circular fronts to the copper furnaces are of glazed brick.

Each living room is provided with a food cupboard, ventilated to the open air, and a dresser with plate rack over.

With regard to sanitary fittings, the sinks are strong stoneware, specially made 10in deep, and connected to 2in. galvanised iron wastes, with drawn lead pipe with D. trap under each sink; the upper end of the waste is taken up 4ft. above the eaves for ventilation. The w.c.'s are of strong fireclay, and the soil pipe is ventilated at the top, and has special screw inspection caps at each connection; this is most important, as in case of a stoppage, it can be put right without breaking the pipe. The ventilating pipes from the soil pipes to the front elevation are terminated with a Boyle's Extract Ventilator, which is enclosed in an ornamental turret.

Dust.—The difficulty of providing for the disposal of dust and house refuse has been overcome by the provision of a dust shoot opening off each landing, which is constructed of 9in. glazed stoneware drain pipes, built into the wall, discharging into a movable receptacle at the bottom, the top of the pipe being ventilated above the eaves.

Balconies.—There is one thing which I think would be an improvement to the plan of these Southampton dwellings, and that is small balconies to each tenement.

The ground floor has been devoted to shops on the street front, and the entrance to the dwellings above is from a common yard at the back of the building.

Materials.—With regard to the materials the most important thing to remember is that everything must be as fireproof as possible.

For walls good bricks are the cheapest and best materials, though I do not think the time is very far off when we shall make a greater use of concrete for building walls. There is a very good hollow fireclay brick made by the Shepwood Company, 2½in. thick for internal walls which can be bought either glazed or plain, or with a fluted surface for plastering. These were used in the bath-rooms and w.c.'s at the lodging-houses here, and are, I consider, a great success.

Glazed Bricks.—This is the best and most sanitary building material that can be made, but has the drawback of being very expensive; however, I think that it is the only material that should be used for dados in corridors and staircases, and round sculleries and w.c.'s, and quite justifies its extra cost, although it is generally the first item that is cut out when the cost of a building has to be reduced. To clothe the walls of a scullery from floor to ceiling with glazed bricks would be extravagant, but it is a necessity as a dado.

Floors.—These have to be of concrete, and the most usual form is 6in. thick on rolled steel joists, the concrete being made either with furnace clinker or coke breeze. This is at present the cheapest kind of concrete floor, but has the drawback of being very heavy, and I believe that when the nature of concrete is better understood, these floors will be made about 3in. to 4in. thick; in fact I have done them 4in. thick, but only in small rooms. There are several patent floors made, but I have found it best and cheapest as a rule to stick to the plain solid concrete and steel joists.

The best covering for floors is 1in. boarding for living and bed-rooms, nailed directly to the concrete, and a rendering of granite-dust and cement for sculleries and w.c.'s.

Stairs.—Stairs should be constructed of good granite concrete moulded *in situ*, and should be ventilated by large unglazed openings on each landing.

Roofs.—There are, broadly, two kinds of roofs—"pitched" and "flat." The pitched roof is the best for appearance, and also for keeping out the wet, but has the drawback that it is not, as a rule, fireproof. The flat roof is fireproof, very ugly, and, in crowded districts, it can be made use of as a playground for the children, or as a washing and drying-ground.

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* A Paper read before the Architectural and Engineering Section of the Sanitary Congress at Southampton on August 30th.

* The diagram referred to was exhibited at the meeting.

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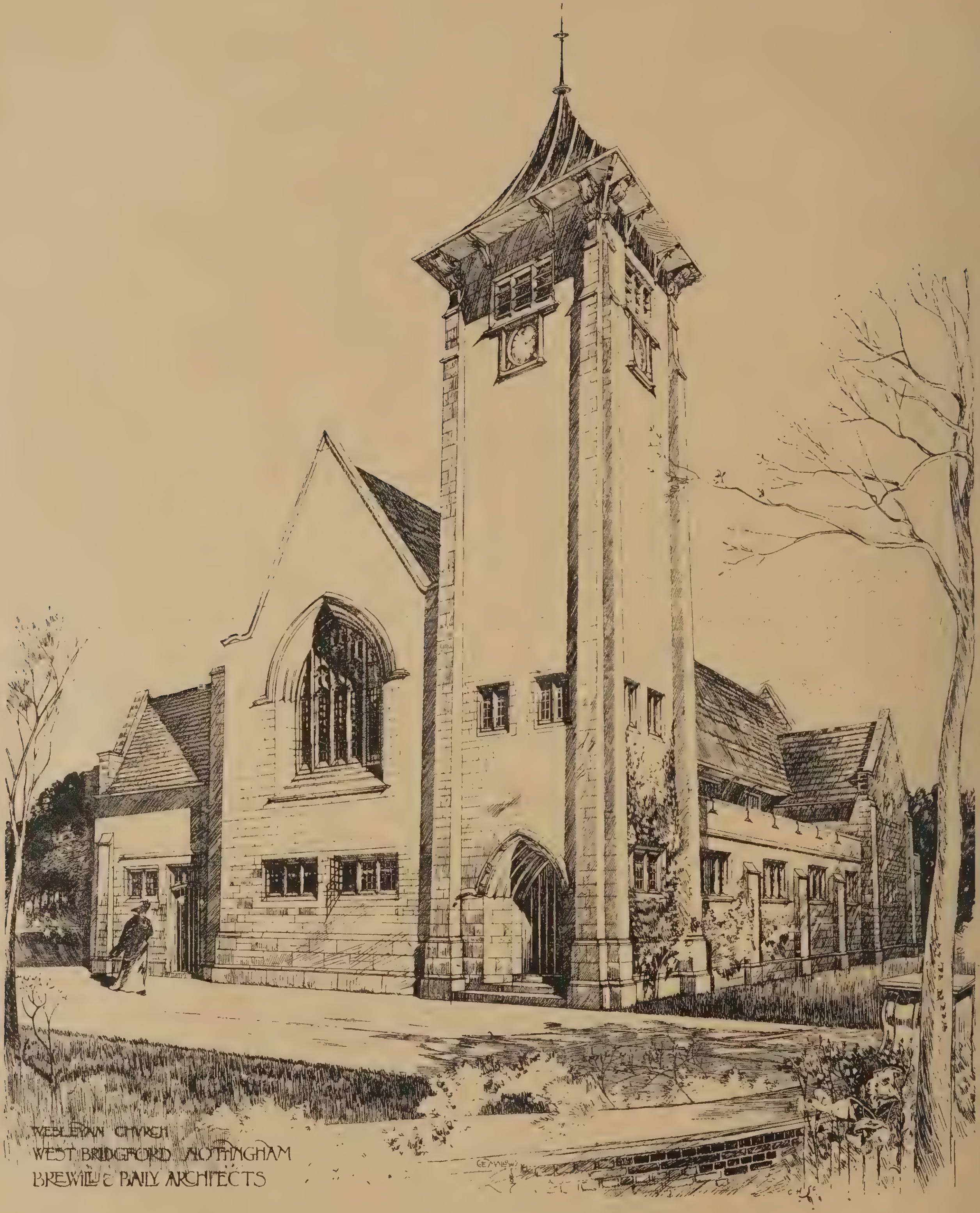

WESLEYAN CHURCH AT WEST BRIDGFORD, NOTTINGHAM. Arthur W. Brewill, F.R.I.B.A., and Basil E. Baily, Architects.

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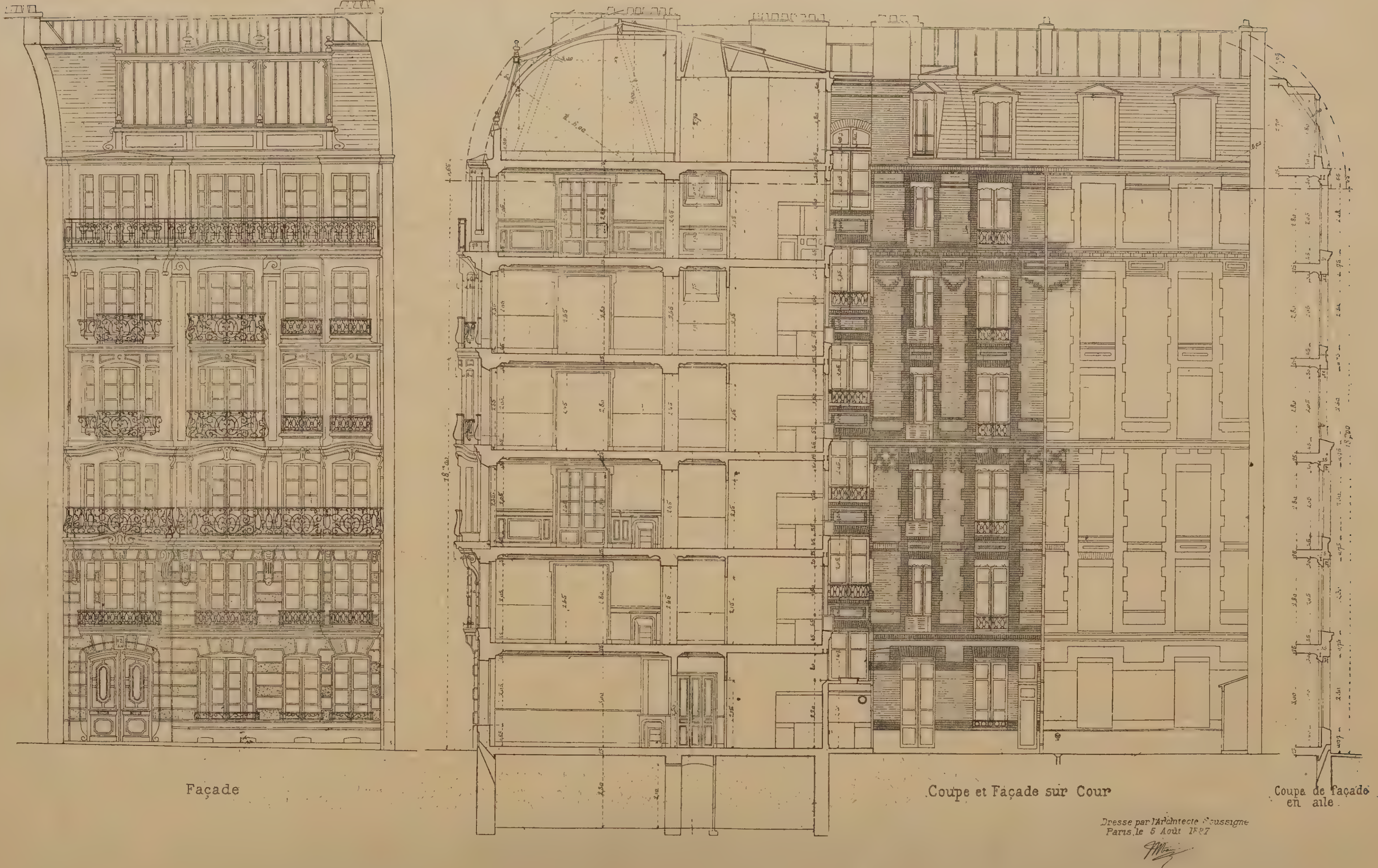
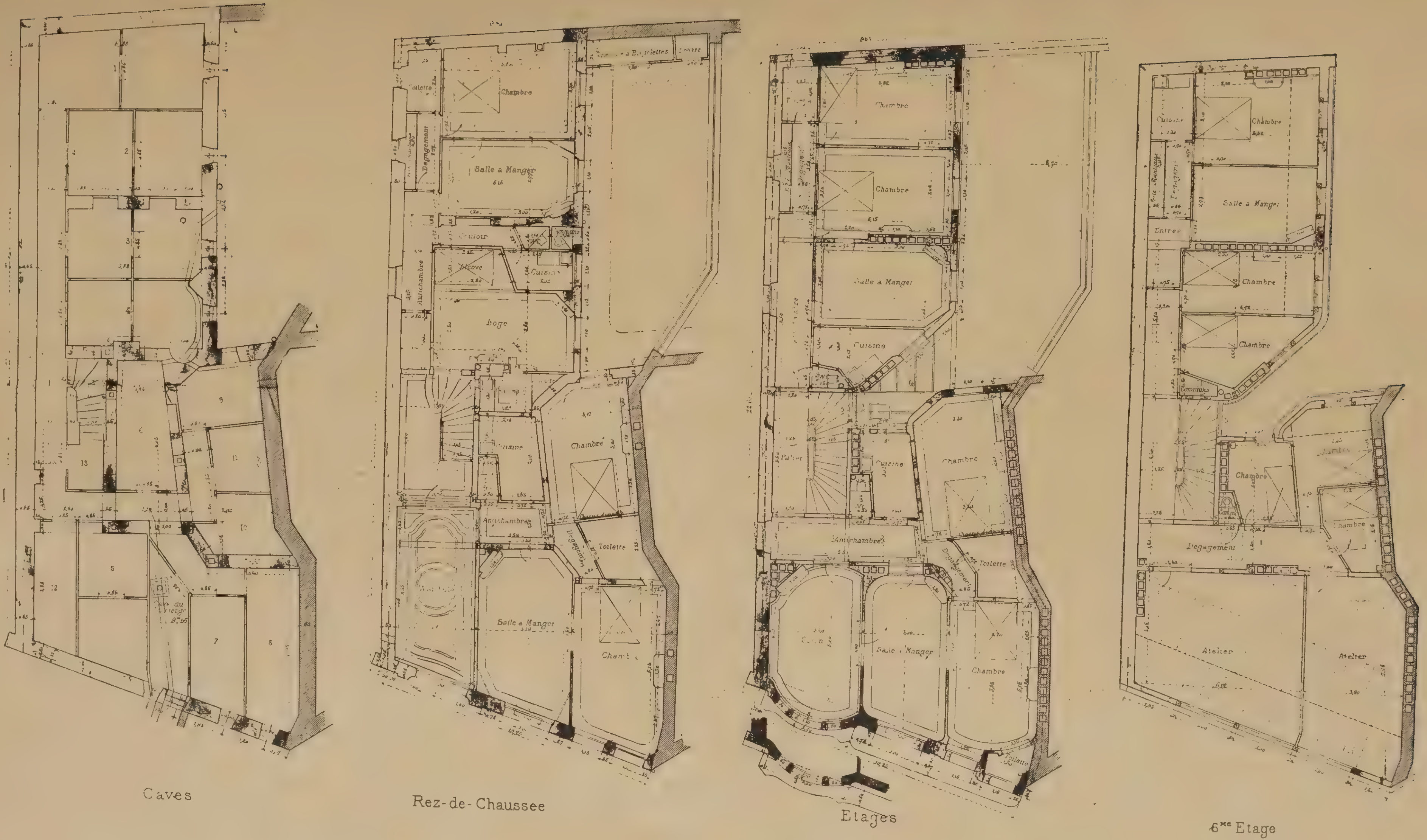
SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, WEDNESDAY, SEPTEMBER 13, 1899.



FLATS IN THE RUE VINEUSE, PARIS. M. H. HANIN, ARCHITECT.



Caves

Rez-de-Chaussee

Etages

6ᴹᴱ Etage

FLATS IN THE RUE VINEUSE, PARIS. M. H. HANIN, ARCHITECT.

Vocabulary of terms on plans:—Caves, Cellars; Concierge, Porter; Rez de Chaussée, Ground Floor; Salle à Manger, Dining Room; Chambre, Bed Room; Toilette, Dressing Room; Antichambre, Hall; Dégagement, Passage; Porte Manteaux, Hanging Cupboard; Cuisine, Kitchen; Loge, Porter's Room; Couloir, Passage; Armoire, Cupboard; Rémise à Bicyclettes, Bicycle Stable; Debarr, Room-Keeping Sundries; Salon, Drawing Room; Pálier, Landing; Etages, Storeys.

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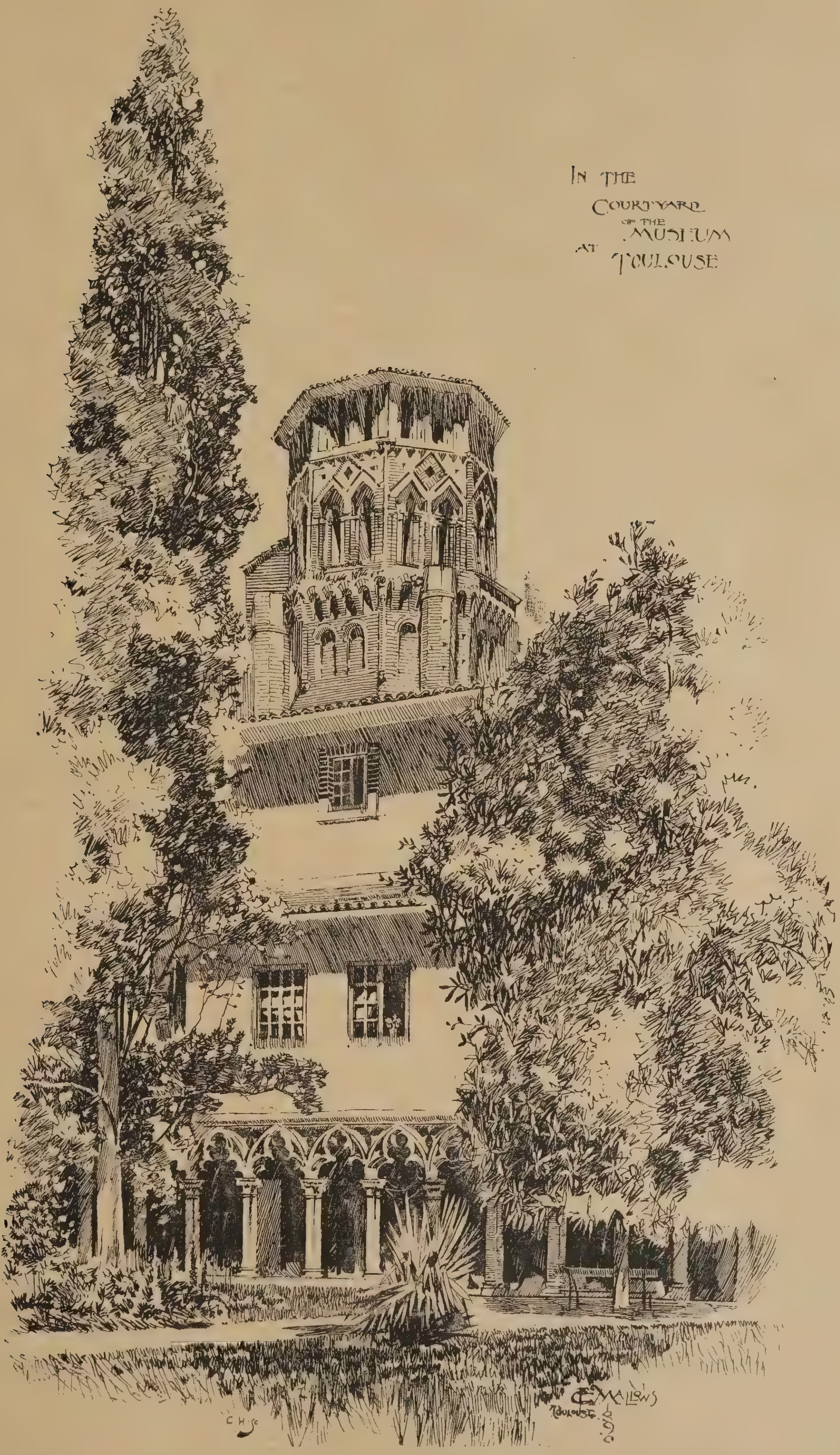

SKETCH IN THE COURTYARD OF THE MUSEUM, TOULOUSE. By C. E. Mallows.

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CENTRAL SCHOOL OF ARTS AND CRAFTS.

Work will recommence on Monday, Sept. 18th, at the Central School of Arts and Crafts, 316, Regent Street, W., (opposite the Polytechnic), which is conducted by the Technical Education Board of the London County Council. The school, which is entering on its fourth session (under the general direction of Mr. George Frampton, A.R.A., and Mr. W. R. Lethaby) has already more than justified its existence, and signs are not wanting that it is beginning to exert a beneficial influence upon the trades represented there. The object of the school is to provide for craftsmen engaged in trades, where artistic handicraft is required, a training both in the principles of design and in its application to their specific industries. The teaching is throughout specially directed to the requirements of the trades in which the students are engaged, and the school is, within certain limits, only open to those actually working at such trades.

At present the school provides teaching mainly for those engaged in bookbinding and silversmiths' work, and in certain branches of the building trade. Other departments, however, are being opened from time to time, as a demand arises, and it is hoped that from the nucleus which exists at the Regent Street school there may eventually grow a complete system of artistic and technical instruction, which will ensure for the artisans of the Metropolis that sound and practical artistic training which, under present conditions of production, they so greatly need.

The instruction given is very complete. In addition to the large general classrooms for modelling and design which are equipped with art examples of the best periods, separate workshops are provided, fitted with all necessary tools and appliances for "large" and "small" silver-work, goldsmiths' and jewellers' work, chasing, engraving, and repoussé work. These classes are in charge of Mr. W. Augustus Steward and a staff of assistants. There is also a class in enamelling under Mr. R. Atkins. The bookbinders' classes, under Mr. Douglas Cockerell, are also an important section of the school, in which quite remarkable results have been achieved. Special classes dealing with the building trade are those in architecture (Mr. Halsey Ricardo); modelling and ornament as applied to architecture (Mr. Roscoe Mullins); design for furniture and metal work (Mr. C. Spooner); stained glass (Mr. Christopher Whall); ornamental lead-work (Mr. F. W. Troup); stoneworking for architects (Mr. Hook); and lectures (free to architects and builders) on Mechanics of Construction (Mr. Percy Kirk). Modelling from the Life is taught by Mr. Mullins; Drawing from the Life, by Mr. Louis Davies, Mr. H. Wilson, and Miss M. Alexander; Wall-paper and Textile Design, Heraldic Drawing, Lettering and Decorative Black and White, by Mr. Catterson-Smith. Other classes are Wood-carving and Gilding (Messrs. Stuttig and Underwood), in which an attempt is being made to bring together once more carving and gilding in picture frames of simple and original design; wood-cuts in colour, by a method based on Japanese practice (Mr. F. Morley Fletcher); embroidery (Miss Ellen Wright, directed by Miss May Morris).

Some adjoining premises have been secured by the Technical Education Board, to meet the continual increase in the attendance at the school. Additional accommodation will thus be provided for some of the existing classes, and new classes will be started in ornamental writing, suitable for illuminated addresses, &c. (Mr. Edward Johnstone), and lithography, which will be carried on as a branch of the Board's Lithographic and Photo Process School at Bolt Court.

The fees are quite nominal, one inclusive payment of half-a-crown per month admitting to all classes (with the exception of the Life Classes). Workmen in receipt of less than thirty shillings a week, pay one shilling a month, and apprentices, learners and improvers are admitted free. Full particulars of any of the classes, and forms of application can be obtained from the Curator, at the School, 316, Regent Street, or from the Secretary of the Technical Education Board, 116, St. Martin's Lane, W.C.

BELFAST CATHEDRAL.

The Foundation Stone of the new Cathedral of St. Anne, to be erected in Donegal Street, on the site upon which St. Anne's Church now stands, was opened last Wednesday by the Countess of Shaftesbury. A design was originally prepared for the Cathedral in the Gothic style, but the great cost, about £200,000, prevented this being carried out. It was accordingly resolved to adopt a design of the Byzantine type of architecture, the estimated cost of the erection of a building of that character being from £60,000 to £70,000. The new edifice, when completed, will be the largest place of public worship in Ireland. It will provide accommodation for nearly 4,000 persons, while St. Patrick's Cathedral, Dublin, has accommodation for about 2,000 only, and Christ Church Cathedral, for about 1,000. About £17,000 having been subscribed, the promoters of the work have felt themselves justified in commencing operations, and a contract has been entered into for a portion of the work, which will cost £19,384. This portion of the undertaking will consist of what may be called the shell of the nave and aisles of the edifice, the intention being to postpone the erection of the imposing front facing Donegal Street, which will be the principal architectural feature of the church—rising to a height of 110ft.—until sufficient funds are forthcoming. The new cathedral will have a 40ft. nave. The disposition of its parts will be broader, simpler, and it will have fewer arches springing over wider spans than in a typical Gothic church.

The Basilican plan proper in this case consists of a nave 40ft. span by 120ft. in length with aisles extending to a total width of 88ft., a dome or centre choir 54ft. by 54ft., and a square chancel extending eastwards for 40ft. further, with two-storeyed aisles, in the upper part of which the organs will be placed. The whole length internally when complete will be 214ft. From each side transepts project north and south at the "crossing," each with a floor space of 40ft. square. The choir will be placed at the "crossing"—as it were among the body of the congregation, in the enclosed division known in the early Church plan as the "chorus cantorum." Appropriate stalls will be placed here for the cathedral corps of clergy. The choir for singing men and boys will be unusually spacious, accommodating seventy voices, while the transepts behind them will be convenient for a large body of assistant voices on occasions of choral festivals. The nave and its staircase turrets rise to 105ft. above the pavement, and in front of them the three great portals which come forward from the nave and aisles extend to 100ft. The great central portal of double doors is embraced in a receding series of arches, of five orders, with shafted and sculptured recessed jambs. The outer arch or order is 40ft. high and 37ft. wide, and is on the same scale as the great west portal of the Cathedral of Genoa, which is also proportionate to a great nave of 40ft. width. A sum of £70,000 will be needed to carry out the architect's whole design, inclusive of what he recommends—a central dome or tower at the crossing, giving a great belfry of the unprecedented floor space of 40ft. by 40ft. Already a gift has been promised of the finest peal of bells that can be cast, the donor being Mr. William Gibson, of Messrs. Gibson and Co., jewellers, Belfast. The plan and proportion of the church are singularly simple and arithmetical. A nave of 40ft., aisles of 20ft. width, six bays of the nave each of 20ft.; the crossing, transepts, and chancel, each within their piers, squares of 40ft.; the internal height of the aisle walls is 36ft., and of the nave and its clerestory 72ft.

For what is known as architectural "style" the architect has had to adapt his design to what seemed to him harmonious with a Basilican plan. To have imitated the Classic Renaissance manner of some Italian Basilican churches would be, in his view, to create a hall somewhat secular and unchurchlike in its associations. The later Italian churches, where a pointed Gothic style of architecture is ingrafted on a surviving Basilican plan, seemed still more incongruous and unworthy of respect. He has adopted a round-arched treatment, the main suggestion of which comes from that Byzantine source, which impressed itself on the early Church architecture that came through Italy by way of the south of France to England and Ireland. The west front will face Donegall Street. The present contract is with Messrs. Henry Laverty and Sons, of Belfast. Mr. Thomas Drew, F.R.I.B.A., President of the Royal Institute of Architects of Ireland, is responsible for the design. Mr. William H. Lynn, R.H.A., has acted as advising architect.

Correspondence.

FINISHING HALF-TIMBERED WORK.

To the Editor of The Builders' Journal.

Mansfield, Notts.

Sir,—With reference to H. E.'s answer in your issue of August 9th, it may be useful for your readers to know that there are numerous examples of rough cast, composed of lime and spar chippings, to be seen in Derbyshire, which, after standing for over two decades, still show a white and pleasing surface. I have also seen similar work in the Midland districts. This white surface is doubtless due to the somewhat smooth surface of the spar, which is cleansed by every shower of rain.—Yours, &c., ANGLICE.

HOUSE FOR MR. JULIAN STURGIS.

To the Editor of The Builders' Journal.

Dear Sir,—In your issue for August 30th is an interesting set of drawings of a house near Guildford. I am puzzled to know, however, how an ordinary-sized person could walk up the stairs, as there is only 4ft. 3in. headroom according to the drawings. Also there seems to be a serious absence of light to the lobby to bedrooms Nos. 1 and 2, which seem to be of peculiar shape. In fact, in my opinion, the house itself is the most peculiar one ever illustrated in an architectural paper. Perhaps the architect will explain.—Yours, &c., ANXIOUS.

Mr. C. F. A. Voysey, the architect of the house referred to, writes in answer as follows:—"Your correspondent should visit the 'House near Guildford,' on the Hog's Back, owned by Mr. Julian Sturgis, and he would find that there is ample room on the staircase for a 7ft. man, and a dormer window on the landing outside Nos. 1 and 2 rooms. I am very busy, and really have not time to justify every detail in my plans, which are the natural outcome of conditions."

Gifts to the London Hospital.—The work of providing increased accommodation for the nurses and patients is being rapidly pushed forward. A gift of £10,000 has been received from Mr. Edward Raphael towards the endowment of a new Jewish ward, and it has been resolved that one of the four wards designed for the new buildings should bear the name of Raphael. A gift of £60,000 had been made by the executors of the late Baroness de Stern towards the establishment of a convalescent home, and it has been resolved to buy land within easy reach of the hospital for the purpose at a cost of £10,000, the remaining £50,000 to be allocated for the maintenance of the home.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"No man is born into this world whose work is not born with him; there is always work, and tools to work withal, for those who will."—JAMES RUSSELL LOWELL.

A Suggested Improvement in Paris.

A WRITER in the Paris "Figaro" makes a suggestion which ought to receive the consideration of the Minister of Fine Arts. It is that the trees in the garden at the back of Notre Dame should be removed so as to display the full view of its beautiful apse. The hideous houses which flanked the cathedral on either side have happily been removed, but this further reform is demanded, before the full glory of the marvel of stone is revealed. "Notre Dame," says the writer, "was not made to be shrouded in a virgin forest, but to be seen complete, from all sides, without obstacles, under all its aspects, of which the most admirable is now concealed. Paris can show nothing more beautiful than Notre Dame, if only she would show it instead of hiding it." The writer concludes with the facetious suggestion that if the destruction of the trees is objected to, they should be "deposed" not killed, and re-planted around the Eiffel Tower.

St. Francis's Church, Handsworth.

THE Roman Catholic Church of St. Francis, in Hunter's Road, Handsworth, has just been re-opened. Three years ago the chancel and Lady Chapel were decorated, and for the past five months the artist, Mr. Jeffrey Hopkins, of Roehampton, has been at work in completing the work then commenced. The present work has been carried out on similar lines to the former, namely, in spirit-fresco, which, when coated with a wax preparation, forms a perfectly permanent process. The work now done consists of the nave and two aisles. The chief feature of the nave is the Twelve Apostles in the spaces between the arches under the clerestory. The roof is divided into square panels, and these have been richly decorated with a cross design on a deep blue cobalt ground. The chief decoration of the aisles consists of the roofs, which are divided into three rows of panels, and these have been alternately enriched with half-figures of saints. The alternate panels are decorated with a monogram of the Blessed Virgin on the Lady Chapel side, and with the monogram "I.H.S." on the Sacred Heart side. The decoration of the aisle walls consists of a canopy design, under which the Stations of the Cross have been placed; these are very fine copies of the old masters by Beyaert, of Bruges, and the new decorations have been carefully arranged to harmonise with the rich colouring of the Stations.

The Guildhall Porch.

UNTIL recently, the walls and roof of the porch at the main entrance to the Guildhall of the Corporation of London have been wholly covered with plaster or concrete and paint, of which latter there were many coats, due to the practice of repainting on the occasion of any special function taking place at the Guildhall. The decorated bosses were also gilded and their coats-of-arms blazoned. Under the direction of the City Lands Committee, the extraneous matter has now mostly been removed and the original stonework is revealed. The state of the walls and the panelling is satisfactory, but many of the ribs of the vaulting are quite perished. The buildings about the porch are not yet two hundred years old, but the interior of the porch itself was built as far back as 1425-6. The Guildhall suffered considerably in the Great Fire, but, fortunately, parts escaped, and the porch is one of them. The interior is entirely of stone, with panelled walls, and roof vaulted in the Gothic style prevailing at the time of erection. The view now obtained is of considerable interest, and probably has not been seen hitherto by anyone now living. The appearance suggests the condition of the porch just after the Great Fire. Early in the present century the whole of the great hall and porch underwent a process of restoration, under the direction of Mr. Frederick Montague, Clerk of the City's Works, a position corresponding to that of the city surveyor to-day. The restoration consisted in covering up all defective stonework with plaster and cement in that spirit of sham-Gothic enthusiasm which ruled at the period. In 1864 this unworkmanlike "restoration" was superseded by a thorough repair of the great hall by Sir (then Mr.) Horace Jones, when the sham work was undone, and all defective masonry was renewed. The porch, till within the last few weeks, existed as it left Montague's hands (for it was not restored by Sir Horace Jones). The beauty of the porch is increased by the uncovering of the original stonework, and the old chalk vaulting is certainly worthy of preservation. It is more than probable, says the "City Press," that the City Lands Committee will report in favour of a proper renewal of the perished stone, and that the Corporation will eventually carry out the work.

Excavations at Waverley Abbey.

THE excavations that are being carried out at Waverley Abbey, near Farnham, have already been attended with much success. The Surrey Archæological Society is anxious to obtain a complete ground plan of the monastic building—an undertaking the extent of which may be gauged by the fact that the south and north walls of the "Infirmary block" have just been traced for 112ft. The foundations of the Infirmary kitchen have also been laid bare; while the idea that our ancestors always bored the trunks of trees for water-pipes is refuted by the discovery of some of the twelve-foot lengths of lead piping through which Brother Symon first supplied water to the Abbey, early in the thirteenth century. There seems to be no doubt that Waverley was the first Cistercian foundation in England. After the Dissolution it fell into ruin, and was eventually used as a quarry for the erection of the comparatively modern Georgian house hard by, which now bears the name of Waverley Abbey. The remains of Waverley Abbey are relatively so scanty that it is difficult to reconstitute it; but it is clear that its architecture was of that noble simplicity which marked the early Cistercian buildings.

Pocklington Church Restoration.

EFFORTS are being made to restore that famous Howdenshire landmark, the Parish Church of Pocklington. This church contains remnants of a Norman church built between the years 1070 and 1080. Many additions have, of course, been made to the original church. The early church, according to the researches of Dr. Alexander D. H. Leadman, of Pocklington, was without aisles, but about the end of the twelfth or early in the thirteenth century a north aisle was added (of which the arcade with its carved capitals remains), and fifty years later a southern aisle was added, and of this both the arcade and the outer wall still exist. A chapel was afterwards added on the north side of the chancel, and a hundred years later the chancel was rebuilt and a clerestory put in, whilst the west tower was also built. One or two of the old windows still remain, but most of the tracery is modern. The church, which is dedicated to All Saints, is cruciform in shape and Perpendicular in style; there are east and west transepts, with a tower at the end, the latter being the most striking external feature, with its battlements, pinnacles, and turret. For a considerable time the church has been getting into a state of disrepair that has caused much anxiety. The fabric has in many places shown signs of decay, and some time ago one of the pillars gave way at the base. To prevent a possible collapse, a beam was inserted across the nave, but in spite of this the conditions under which public worship is conducted are anything but agreeable, rain percolating through the roof in wet weather. About £8,000 are required to carry out the restoration, and about £1,500 have been already subscribed. We would impress upon the promoters of the scheme the necessity of engaging a thoroughly qualified architect to carry out the work, and leaving the restoration in his hands, for there seems to be some idea at present that the church should in part be reconstructed to its original form, and modern decoration used in place of the old.

An Architectural Visit.

ON Saturday, September 2nd, a large party of the members of the Architectural Association of Ireland visited Powerscourt House, Enniskerry, where they were received by Lord Viscount Powerscourt, K.P., who conducted them over the house and beautiful gardens, with the magnificent terraces designed by Mr. Penrose. The house is an old Georgian mansion. The architect of this mansion—the finest in Ireland from an architectural point of view—was Cassell, who flourished about 1780, and who is known chiefly as the designer of the Houses of Parliament, Leinster House, and the Dining Hall, Trinity College, Dublin, which we illustrated in a recent number. The fine collection of pictures and other art treasures, collected by the present and former Lords Powerscourt during travels in many lands, were also noticed. The members were subsequently most hospitably entertained by his Lordship.

Housing of the Working Classes.

AT a recent meeting in the Collingwood Hall, Newcastle, of a local conference of delegates from trade union branches, miners' lodges and co-operative societies, the following resolution was carried unanimously: "That this conference is of opinion that the overcrowding and bad housing conditions prevailing in many parts of the City of Newcastle, together with the high rents working men are compelled to pay as a result of the scarcity of the supply of comfortable and healthy dwellings, constitute a disgrace to the City of Newcastle; and this conference therefore respectfully urges the City Council to adopt and put into operation the clauses contained in Part III. of the Housing of the Working Classes Act, 1890, and thus increase the supply of comfortable cottages, let at fair and equitable rents. That this conference, realising the great need for housing reform, is of opinion that it is the duty of co-operators to help in this respect those least able to help themselves, and therefore urges all co-operative societies in the district to earnestly consider the possibility of safely using capital in the erection of good houses, such houses to be let to members at the lowest possible rents (consistent with a fair return upon the capital invested), and thus brought into effective competition with bad houses at exorbitant rents."

Restoration Work at Largs.

THE ceiling of the burial aisle of the Montgomeries, in the old churchyard at Largs, is in course of being restored. The work is being done for the Earl of Eglinton, who owns the aisle. This aisle and the monument which it protects are the most precious antiquarian relics in Largs. The ceiling which is being restored just now is of wood, and is divided into forty-four compartments by means of panels and mouldings. These compartments, which are of various forms and sizes, bear paintings of various subjects, among them being the signs of the Zodiac; Eve being tempted by the serpent; Jacob ploughing; Esau herding; and the old church that once stood in the churchyard. Another of the pictures has a peculiarly pathetic interest, as it shows the tragic death of the wife of Sir Robert Montgomerie, for whom the aisle was built. This lady died from the effects of a kick which she received from her horse at Largs Fair in 1624. Under the treatment to which the paintings are being subjected just now some of the colours are beginning to show up with something like their pristine freshness. More interesting still from beneath the grime of 263 years there have emerged several trees in one or two of the pictures whose presence there was not suspected. The woodwork that has escaped the damp, which for long percolated through the roof, is wonderfully fresh considering its very advanced age. The aisle is also the repository of the piscina of the ancient church found just recently.

Fireproofing at the Paris Exhibition. THERE will be an important collective exhibit at the forthcoming Paris Exhibition, representing the fire resisting materials, systems of construction, and appliances of Great Britain. The arrangement of this collective exhibit (the first of its kind) is in the hands of the British Fire Prevention Committee, to whom the Royal Commission has allotted the necessary space gratuitously, recognizing the national importance of the idea and the disinterestedness of the efforts being made by the Committee to show what the country can produce in this direction, Mr. Frederick R. Farrow, F.R.I.B.A., Chairman of the Commercial Section of the Committee has kindly undertaken the direction of this collective exhibit and it has been decided that all applications from all British and Colonial firms to be represented in this national exhibit must reach the offices of the committee by October 7th. The committee itself will exhibit a model of its testing station, specimens of reports, and the like.

The L.C.C. and the Housing Question. IN the Metropolitan Tribunal of Appeal, sitting at the Surveyors' Institution, Westminster, and composed of Mr. Cates, president, Mr. Hudson, legal adviser, and Mr. Penfold, an important appeal against a decision of the London County Council was heard last Wednesday. The appellant was Lord Llangattock, lord of the manor of Walworth. It appeared that some time ago Lord Llangattock decided, after acquiring certain leases of houses in Nursery Road, Walworth, to pull them down and on the site to build high-class dwellings for the artisan classes. He also proposed so to deal with a vacant piece of land fronting the houses at present standing in Nursery Road, and, in consideration of certain concessions under the London Building Act, he agreed to give up some land for the public use. Plans for the proposed alterations and buildings were sent to the County Council, but that body refused its sanction, and the case went to appeal. The tribunal did not then see their way to pass the plans for the original scheme, but granted an adjournment for one of a more complete and comprehensive character to be prepared. Yesterday Lord Llangattock's agents presented the plans for the new scheme, and, after statements and evidence on either side, the tribunal reversed the decision of the County Council by granting the appeal, subject to certain conditions being complied with.

The A.A. Discussion Section. THE secretaries (Messrs. R. Henry Weymouth and George H. Smith) of the Discussion Section of the Architectural Association have favoured us with the list of meetings to be held in this section during the forthcoming session of 1899-1900. On Oct. 13th a debate on "The Registration of Architects" will be opened by Messrs. A. R. Jemmett and G. A. T. Middleton; on Nov. 3rd a paper on "Brasses," by Mr. G. H. Smith; on Nov. 17th, "Tenement Houses for the Working Classes," by Mr. Robert Williams; Dec. 1st, "Church Furniture," by Mr. F. C. Eden. On Jan. 5th, 1900, a paper on "The Public Monuments of London, Architecturally considered," will be read by Mr. V. H. King; Jan. 19th, "Granite as a Building Material in the Channel Islands," by Mr. C. B. Bone; Feb. 2nd, "Opening up Land for Building Purposes," by Mr. G. M. Nicholson; Feb. 16th, "Some Aspects of Modern Architecture," by Mr. W. A. Forsyth; March 2nd, debate, "The Question of the Model By-Laws," by Messrs. J. Humphrey Jones, B.A., J. H. Tyars and F. T. W. Goldsmith; March 16th, "The Church of St. Francis, Assis," a study in colour decoration, by Mr. W. E. Dobson; March 30th, "Ventilation and Warming," by Mr. T. W. Aldwinkle, jun.; May 18th, "Some Essentials to Health," by Mr. H. C. Lander; May 25th, "The Legal Position of the Architect," by Mr. L. L. Macassey, barrister-at-law. With such a programme this Section ought to be well supported this session. The usefulness of the Section has been too little known in the past; some of these comparatively informal discussions are calculated to give more practical help to working members than the more ethereal dissertations of the general meetings. A very good feature of the meetings is the asking of practical queries previous to the business, these questions being answered by any members present who have had the needful experience.

Dorchester's Roman Amphitheatre. MR. J. J. FORSTER, in a letter to the "Times," makes an appeal to those in authority over the Roman Amphitheatre, at Dorchester, for its protection from injury. He says that until quite recently Dorchester might be said to have been contained within its "walks," avenues of trees following the lines of the old walls of "Durnovaria," and to this fact might be attributed the admirable preservation of the amphitheatre, which stood without the walls of the Roman station; but now the increase of the town has led to its spreading out and over Fordington Field, so that whole streets are now being built beyond the amphitheatre, which will soon be surrounded with houses. Herein lies the danger to which he wishes to call the earnest attention of archæologists and of Dorchester folk before it be too late. Doubtless many of the people who live in the cottages which have sprung up take a short cut across the amphitheatre in going to and from their work, thereby saving a few yards. This is a natural thing to do, but he fears it spells mutilation to "Membury Rings" (as it is locally called), for the path already made across it grows wider and wider. This Roman arena is an heirloom which should be jealously protected, for it is probably not to be matched at Silchester, or Colchester, or any other "chester" in England.

West Bridgford Wesleyan Church, Nottingham. THIS Church, of which we give an illustration by Mr. C. E. Mallows in one of our centre plates this week, has lately been erected in West Bridgford, a suburb of Nottingham on the south of the Trent. The material used in its construction is hammer dressed Coxbench stone. The church has seating accommodation for about 600. The interior woodwork throughout has been stained a bronze green, and the chancel portion has been finished with tapestry hangings from Messrs. Morris and Co., of London. The work was carefully carried out by Mr. W. Maule, Contractor, of Nottingham. Messrs. Arthur W. Brewill, F.R.I.B.A., and Basil E. Baily, of Pelham Chambers, Angel Row, Nottingham, and also of Newark-upon-Trent, are the architects.

Hailes Abbey, Gloucestershire. AN appeal is being made for funds to continue the exploration of the ruins of this attractive Cistercian Abbey. Though the church and conventual buildings had suffered most deplorably from neglect and wholesale depredation for the last three hundred years, the site deserves a complete and systematic exploration, both with a view to recovering what might remain below the accumulated soil and to preserving from further destruction that which still stands above ground. Seventeen arches survive, some belonging to the restoration of the Abbey after a fire in 1271, and therefore in bold Early English style; others dating from certain Fifteenth Century restorations, probably after another and unrecorded conflagration. The north wall of the cloister which divided it from the south aisle of the church, though "skinned," is fairly complete; while on the east side stands the door of the sacristy(?), three fine pointed arches belonging to the chapter house, the door of the slype and that of the under-croft of the monk's dormitory. On the south side are remains of the staircase leading to the latter, the Early English door of the warming-parlour, the lavatory (Perpendicular), and the great door of the refectory while on the west, where formerly stood the apartments of the Abbot and of the "Conversi," or lay brethren, stand only three arches (Perpendicular) of the inner wall of the cloister. Since 1698 the Conventual buildings have been practically deserted and became the general quarry for the neighbourhood. There is scarcely a wall or a cottage for miles round which has not in it a portion of Hailes Abbey, a tile, a jamb, a sill, or a bit of coping.

Work Already Done. NEVERTHELESS, while clearing out six feet of soil and rubbish on the site of the Chapter House, a structure 47ft. deep by 35ft., in three arcades, five out of nine grand Early English bosses sculptured with conventional foliage deeply undercut, one of which, in addition, bears the figure of Christ tearing open the jaws of a lion, which He is bestriding, have been recovered. The treatment of these figures strongly recalls the contemporary work of Giovanni Pisano. The quatre-foliate bases of the piers which carried the elaborate ribbing of the vaulting have also been uncovered *in sitû*. The preservation of these bosses is remarkable. Above them lay a thick stratum of burned timber, the *débris* of the dormitory. The cloister-garth has been cleared, and the bases of all the doors and the lavatory of the monks have been disencumbered and brought to light, during the course of which operations some two hundred tiles bearing abbatial monograms and illustrious charges have been recovered, and, above all, six beautiful heraldic bosses dating from this side of 1510, but before 1530. These bear the arms of Huddlestone, Percy, Stapleton, Compton and Evesham Abbey, and contain in themselves an entirely new chapter of the history of Hailes. In addition to these, the responds of the piers of the south aisle of the Abbey church and its high altar have been found.

Appointment of Architects. THE following report of the proceedings at the monthly meeting of the Glasgow Parish Council last week—Mr. James Brand, J.P., presiding—is of some interest as showing the opinion some public men have of architects. The minutes of last meeting stated that the committee had taken steps to acquire the necessary land upon which the new hospitals might be erected, and that the committee secure the services of a competent architect for the preparation of the plans, &c. Objection was taken to giving powers to the committee to appoint an architect. It was argued that it would be fairer to have open competition. The chairman said that whatever the minutes said, he undertook that the appointment of an architect would be submitted to the Council for it's approval. Mr. Haddow understood there should be competing plans sent in. The chairman said he never found any good result from open competitions. When the name of an architect was produced it would be time enough to make an amendment. The minutes were then adopted as correct. The minutes of the Finance Committee on the subject of office accommodation stated that the committee had unanimously appointed Messrs. Thomson and Sandilands, architects of the proposed new buildings, at a fee of 3½ per cent on the measured cost upon completion. Mr. Sadler thought the appointment of an architect for the new office buildings should be advertised. Otherwise it would not be fair. He moved an amendment accordingly. Mr. Morrin, in seconding the amendment, said that architects had their own friends. Mr. G. Ogilvie said it was a distinct understanding that the Council gave the committee full powers to appoint an architect. It would be unfortunate if the amendment were carried. Whether the Council had been misled by the motion unanimously approved and confirmed at a subsequent meeting, it would be unfair and unbusiness-like to allow the amendment to be discussed and passed. The committee were not moved by personal considerations. The chairman ruled the amendment incompetent.

Professional Practice.

Aberdeen.—The Plans Committee of the Town Council have approved the plans of the following buildings:—Seven dwelling-houses on the north side of a new street to be laid out (through the property of Hollybank), between Holburn Street and Hardgate, for Mr. A. L. Robb, builder; two dwelling-houses on the west side of Holburn Street, for Mr. William Alexander, Cluny, per Messrs. Walker and Duncan, architects; two dwelling-houses on the north side of Bedford Place, for Mr. George Fraser, agent, per Mr. William Robertson, Jasmine Terrace; dwelling-house on the west side of Gray Street, for Mr. Alexander Anderson, builder, per Messrs. Brown and Watt, architects; alterations on warehouse in connection with the North of Scotland Distillery, Hardgate, for the Daluaine-Talisker Distillery Company, Limited, per Mr. Charles C. Doig, architect, Elgin; alterations and additions in connection with premises on the west side of Charlotte Street, for Messrs. John M'Adam and Sons, contractors, per Messrs. Brown and Watt, architects; additions in connection with warehouse on the north side of John Street, for Messrs. Clegg and Thomson, iron merchants, per Mr. R. G. Wilson, architect; alterations and additions in connection with dwelling-house No. 168, Holburn Street, and workshop at rear of the dwelling-house, for Mr. S. Simpson, carpenter, per Mr. R. G. Wilson, architect The committee had also before them plan of four dwelling-houses on the south-west side of Grampion Road, for Messrs. Duncan and Stuart, builders, per Mr. Duncan Hodge, architect. The committee approved of this plan, on condition that the height of the water cisterns is to fixed by the burgh surveyor. The committee had also before them amended plan of proposed alterations and additions in connection with the premises No. 421, Union Street, for Mr. William Garvie, builder, per Mr. William E. Gauld, architect. The committee disapproved of the proposed new level of the cellar floor, and fixed the level at which this floor is to be laid. In other respects the committee approved of the plan.

Auchterarder.—Messrs. Henderson Bros., Cycle Agents, have just had new premises erected from designs, and under the supervision of Mr. W. J. Anderson, 95, Bath Street, Glasgow. The building is English Renaissance in style. It has a frontage of about 40ft., and is two storeys in height. The ground floor consists of show rooms, offices, &c. The upper floor is divided into dwelling rooms, with an entrance from a back court. The following were the contractors for the several works: Mason, Mr. Alexandar Ritchie, of Auchterarder; joiner, Mr. Alexander M'Gregor, of Blackford; slater, Mr. Robert Gibson, of Auchterarder; plumber, Mr. D. Jamieson, of Auchterarder; plasterer, Mr. M'Laren, of Auchterarder.

Christiania.—The new national theatre was opened on the first of this month by King Oscar II. Externally the building presents few features of interest. It is, however, an imposing, if somewhat heavy, structure of yellow brick with granite facings in the Italian Renaissance style, and in front, on two marble pedestals, are bronze statues of Ibsen and Bjornson. Internally the style is chiefly modified rococo. The auditorium is spacious, accommodating 1,268 spectators, well ventilated, and with admirable acoustic properties. The stage is 70ft. wide by 46ft. in depth, with an additional back portion to be used when required, 22ft. wide by 26ft. in depth. The width of the stage at the curtain is 35ft., the height 26ft., and the total height from basement to roof is 107ft. The vestibule, stairs, cloak-rooms, corridors, and foyer, are large and suitable for all requirements. The cost has been about £37,000. The exterior of the building has the blunt and somewhat dull character which, to an English eye, ruins the effect of most Norwegian architecture in brick and stone. It is, however, only fair to say that it is seen at a disadvantage just at present, and that the main façade lacks its frieze representing the death of Sigurd Favnesbane, which the sculptor, Mr. L. Utne, is preparing for it. There are also to be a group of "Culture the Conqueror" and other symbolical sculptures, all, it may be remarked, a gift from the King. The main entrance opens upon a double staircase, the steps and balustrade of which are alike of white Norwegian marble. The walls are inlaid with coloured marbles, and the ceiling, richly carved, is decorated, on a ground of gold, with flying figures painted by the artist, T. L. Wilberg. The staircase is exceptionally broad and easy of access; and, indeed, throughout the building the greatest possible care has been taken to provide against the dangers of fire and panic. At the head of the staircase corridors lead in all direction; one, which is upholstered in violet silk, conducts to the great foyer, the roof of which is a very magnificent piece of accumulated ornament, supported by a range of white marble columns, and by four life-sized caryatides, representing Drama, Comedy, Dance, and Tragedy, the whole carved by Mr. Utne. The painted ceiling is the work of Mr. Skredsvig. The walls are hung with dark-red silk brocade. The principal adornments of the foyer are a life-sized marble statue of the greatest actress Norway has produced, the late Laura Gundersen, and a colossal bust of Holberg in bronze. The former is the work of Stephan Sinding and the latter of Mathias Skeibrok, these being the two leading sculptors of the day. After the opening ceremony the King conferred on the architect, Herr Bull, the Order of St. Olaf.

Dudley. — The New Opera House was opened last week. It occupies a commanding position, with a frontage to the Birmingham Road, and is situated close to two railway stations and the termini of four tramway systems. The style of architecture is Italian Renaissance, and the material of the elevation is red brick, with terra-cotta dressings. In the oval panels occupying a prominent position in the centre of each wing of the façade are inscribed in gilt Shaksperian quotations. There is a frontage of 150ft. in breadth and 66ft. in height from the ground floor to the figure on the apex of the façade. Four double pairs of swing-doors lead to an entrance hall, similar doors to the right and left being provided for exits. The floor of the entrance hall is tesselated, and the walls have an encaustic-tiled dado and richly embossed cornice. A door from the entrance hall opens directly into the pit, and a broad open staircase with encaustic-tiled dado leads to the dress circle foyer, which overlooks the main road. The height of the interior of the theatre from the floor to the dome is 41ft., and the arrangement of the auditorium, which is capable of seating 2,000 people, consists of orchestral stalls, pit, dress circle, amphitheatre and gallery, whilst in the immediate vicinity of the stage are six private boxes, three on each side. The decorations of the interior are on an elaborate scale. The dome is supported by eight panelled buttresses with ivory-white mouldings, and the large central space of the ceiling is richly moulded. The stage will allow of the most elaborate scenic effects, the width being 72ft. 6in., the depth 36ft,, and height, from the floor line to the gridiron, 50ft.; whilst the proscenium opening is 26ft. wide. The platform round the stage from which the scenery is regulated, technically termed "the flies," is about 20ft. above the floor level, and is large and substantial. The act-drop has been executed by Mr. W. Telbin, the well-known scenic artist. The dressing-rooms are situated on the three floors of one side of the theatre, and are commodious and comfortable. There are separate refreshment bars. The building is fitted with the most modern heating appartus, and ample fire extinguishing appliances have been provided in all parts. Emergency doors are numerous, the stairs are easy of ascent and descent, and the doors have been provided with "panic-bolts." The building will be illuminated by electricity, which will be generated upon the premises, and in addition there is a complete gas installation. Nearly the whole of the work has been executed by Dudley firms. The architect was Mr. A. Ramsell; the builders were Messrs. Whittaker and Co., and the decorators Messrs. Wythes and Son; the electric installation was provided by Messrs. Whittaker Brothers, and the plastic adornments by Messrs. Dean and Co., of Birmingham. The new theatre will take the place of the old Colosseum in the Trindle Road.

Dundee.—The Victoria Street U.P. Church, has been closed during the past few weeks to allow of the interior being painted and redecorated. Messrs. P. and A. Davie, painters, Victoria Road, have, under the superintendence of Messrs. James Foggie and Sons, architects, carried out the work. Panels with beams divide the ceiling, and the former are done in a pale blue colour, with an enclosing band, into which a suitable ornament in marone is introduced. The beams are painted in a cream coloured tint. The walls are of sage green, and round the top runs a broad band in a Greek or Gothic frieze in colours, supported by lines and bands; while along the bottom is an inlaid ornament in imitation fretwork. The pulpit wall is relieved with dapier work on a dark background, with a band of gold stars, and surmounted with an imitation crown. On the pillars supporting the gallery and beams, light colours are used, while the capitals are relieved in colour and gold. Gilding has been freely introduced on the pulpit and gallery, and the whole of the woodwork has been revarnished. In the vestibule and staircase, the walls are decorated in a warm buff colour, with ornaments in olive green and brown. The hall adjoining the church, as well as the vestry and managers' rooms, have also undergone redecoration.

Greetland.—A new board school for the Greetland district, erected by the Elland-cum-Greetland School Board, was opened last week. The building, which has been erected from the designs of Mr. W. C. Williams, architect, is arranged in the form of the letter T. The long arm facing the road comprises the school for girls and boys. This contains a large room for teaching and assembling purposes, 61ft. by 24ft. 6in, with a class-room 24ft. 5in. by 22ft., entered out of the teaching-room from the centre. At each end smaller class-rooms are placed, with access from the large room at the ends. The total accommodation provided is for 266. At each end of the assembly or teaching room, and overlooking the same are teachers' rooms. The infants' school forms the central arm of the letter T, branching out from the centre of the main block. The principal infants' room measures 33ft. by 24ft. 6in., and there are two class-rooms on each side of the hall. Ample playgrounds are provided. The contractors are:—Masonry, Benjamin Akroyd, Stainland; joinery, J. E. Crowther, Elland; plumbing, J. W. Sykes; plastering and slating, Seth Collins and Sons, Stainland; heating, W. H. Jagger, Elland; painting, W. Robinson and Sons, Greetland; iron railings, A. Kitchen, Elland; asphalting, A. Kershaw, Brighouse; and furnishing, North of England Furnishing Company.

Handsworth.—New Board Schools were opened last week in the Rookery Road. The schools, which have been erected from the designs and under the superintendence of Mr. Edward Holmes, architect, of Corporation Street, provide for the accommodation of 1,060 children. The schools comprise an infants' department, consisting of central hall, five class rooms, and babies' room, and the girls' and boys' departments having five class rooms each, arranged on either side and end of a spacious central hall. There are also the usual masters' and mistress's rooms, book stores, and a detached caretaker's house. The style of the buildings is Renaissance, the details being executed in Ruabon red terra-cotta. The central halls and class rooms are dadoed with white glazed bricks, and the walls above are finished in fine plaster. The schools are thoroughly and efficiently heated and ventilated by the special Plenum system of Mr. William Key, engineer, of Glasgow, and the sanitary fittings were supplied by Sir Henry Daulton and Co. The cost of the schools, exclusive of site and furniture, is about £14,000. The builder was Mr. John Webb, Handsworth.

Hereford.—It is expected that the installation of electric light at Hereford will be ready for "switching on" by the first week in October. The building is now almost out of the builders' hands, and nearly all the cables are laid, the main work remaining being the delivery and fixing of the machinery and apparatus. The electrical works, situated in Widemarsh Street, are divided into three blocks—the boiler house, occupying the front end, and facing the street, the engine house, which is in the middle, and the battery room, which stands at the rear. The total length of the buildings is 116ft., the width 46ft., and the highest point over the engine house, 40ft. The boiler house measures 50ft. by 44ft., the engine house 30ft. by 39ft., and the battery room 30ft. by 44ft. The walls are of brick. The whole of the building is lighted by means of lanterns and skylights and iron windows, and Hope's Patent Indestructible glazing is used. In the engine room there is a dado of glazed bricks, 6ft. high, finished with a moulded capping, while above this buff-coloured bricks are used, and springing from the windows on each side are semi-circular arches. The arches and the labels, together with the top corner pieces in the front, are of Dennis' terra-cotta. The roofs are already slated, and the glazing is practically completed; the floors will be composed of granolithic in the battery house and Staffordshire blue and red quarries in the engine room. For the present two boilers will be fixed, room being left for a third when an extension of the plant becomes necessary; and there will also be two steam dynamos, with space left for another dynamo when required. The chimney, which is detached from the main building, has been completed. This stack is 95ft. high, with a diameter at the base of 12ft. and at the top of 6ft. 6in., and is of octagonal shape. At the rear of the chimney and likewise outside the main building is an economiser, the object of which is to lessen the smoke which passes up the chimney, and, at the same time to heat, the water-feeder supplying the engines. There is also close by an evaporative condenser, which is to condense the steam passing from the engines. The cables in the streets will be on the three wire system. There are several contracts in connection with the undertaking:—(1) for building the boiler, engine, and battery house; (2) for erecting the chimney stack; (3) for manufacturing and supplying the iron work; (4) for erecting the lightning conductor on the chimney, &c. The two building contracts—Nos. 1 and 2—and also that for putting up the lightning conductor were secured by Messrs. W. P. Lewis and Company, and that for the iron work, No. 3, by Messrs. Alexander and Duncan, of Leominster. The electric machinery and cables are being supplied by the India Rubber, Gutta Percha, and Telegraph Works Company, Silvertown, London. Mr. Parker, the City Surveyor, prepared the whole of plans, specifications, quantities, &c. Mr. W. Moore, one of Mr. Parker's assistants, has officiated as clerk of the works of the building. Mr. F. G. Poulton is the resident engineer.

Irvine.—Plans have been passed for the new academy. The School Board intend demolishing the present academy and erecting in its place a more modern and commodious building at a cost of £10,000. On the ground floor there will be masters' room, cloak and classrooms, central hall, lady superintendent's room, rector's room, music and reception-room, sewing-room, &c.; and on the first floor physical laboratory, classrooms, examination hall, cookery room, and laundry, cast room, elementary drawing room, laboratory, balance room, lecture theatre, preparation room, balcony, corridors, &c. To the west of the main building there is to be a range known as the gymnasium range, which will embrace a workshop, gymnasium, dressing-rooms, and playgrounds. The architect is Mr. John Armour, jun.

Newcastle.—The new Westgate Hill Board School has just been opened. It stands upon an open site at the corner of Bishop's Avenue in Westgate Road, of rather more than an acre in extent, and is planned with three stories; the ground floor being devoted to the infants, the first floor to the junior mixed department, and the upper floor to the seniors. Separate staircases are provided from the ground to the first floor, and from the ground to the upper floor, so that there may never be any crushing of the children when both floors are emptied at the same time; four staircases in all. On each floor there is a central hall, 60ft. by 30ft., having its long side filled with windows, and facing the south. Round the halls are grouped the schools and class-rooms. On the upper floor there are five class-rooms, each for sixty children, and two schools for ninety-two each, providing in all 584 places in the senior mixed department, including 100 in the central hall. On the first floor are five class-rooms, the same as above; and two schools for seventy each, the central hall holding 100; total, 540. The infants' department contains four class-rooms for sixty each; a babies' room for fifty, and the hall, 100; a total of 390. The three departments provide accommodation for 1,514 children. The desks, seats, &c., have been supplied by Messrs. Grant and Lewis, Newcastle. As the infants do not require the same amount of space given for the children upon the upper floors, covered playgrounds are provided under wings of the building, facing south. Large cloak rooms are placed on each floor, at either end of the buildings for boys and for girls. There are also private rooms for the teachers (male and female), with lavatories adjoining. These are arranged upon Mezzanine floors between each main storey. All rooms are amply lighted, and the windows are arranged so that all desks have the light upon the left hand. The whole building is warmed by a hot water apparatus, having ventilating coils, so that the fresh air is heated before entering the rooms. Each coil can be cut off at will. There are ventilators in every room, connected to two large upcast shafts, through which foul air is extracted, and arranged so as to renew the air three times in every hour. This work has been carried out by Messrs. Emley and Sons, of Newcastle. The school is built of bricks with terra-cotta dressings. The playgrounds are laid entirely with cement. A small house for the caretaker is placed near Westgate Hill. The work has been executed by Mr. Thos. Lumsden, contractor, of Jarrow, from the designs of Messrs. Dunn, Hansom, and Fenwicke, architects, of Eldon Square, Newcastle. The cost has been £24,000.

COMING EVENTS.

Monday, September 18.

Central School of Arts and Crafts, Regent Street, London, W.—Session opens.

Thursday, September 21.

Royal Institute of Public Health.—Congress at Blackpool until September 28th. Health Exhibition at Blackpool until October 14th.

Monday, September 25.

City of London College (City Polytechnic).—Michaelmas Term opens.

Thursday, September 28.

Royal Institute of Public Health.—Last day of Congress at Blackpool.

Monday, October 2.

Worshipful Company of Carpenters.—At the Carpenters' Hall, London Wall, E.C. Commencement of evening classes in building construction, drawing, and quantities. Architectural lectures at the King's College, London. Particulars can be obtained from the Secretary at the College, or from Mr. S. W. Preston at Carpenters' Hall.

Friday, October 6.

Architectural Association.—Annual general meeting. President's address and distribution of prizes. 7.30 p.m.

Monday, October 9.

Worshipful Company of Carpenters.—At the Carpenters' Hall, London Wall, E.C. Commencement of evening classes in architectural and constructional drawing, quantities, surveying, &c., and lectures on architectural construction at the University College. Particulars can be obtained from the Secretary at the College, or from Mr. S. W. Preston at Carpenters' Hall

Keystones.

A Memorial Window to Jane Austen is to be erected in Winchester Cathedral.

All Saints National Schools, Lynn, have been enlarged by the addition of new class rooms. Mr. Eagleton was the architect.

A New Workhouse at Stamford is to be erected at a cost of £23,150. Messrs. Walker and Slater, of Derby, are the contractors.

A Portrait of the Earl of Dalhousie, by Mr. John Sargent, A.R.A., was presented to the young Earl last week on the attainment of his majority.

The Fund for the Restoration of Paisley Abbey now amounts to £20,000, but to carry out the scheme in its entirety £20,000 more will be required.

A New Public School at Eaglesham is being erected on the north side of the Strathaven Road; it will accommodate 250 pupils. The cost will be £3,000.

A Home for Incurables at Harrogate is being erected from plans by Mr. T. E. Marshall, City Bank Chambers, James Street, Harrogate, at a cost of about £9,000.

The Fund for the Restoration of York Minster has now reached £13,000. As the sum required is £50,000, an urgent appeal has been made to Yorkshire to help in obtaining this.

A New Parish Church is being built at Ardross, in Ross-shire, by Mr. Perrins, proprietor of Ardross Castle, as a thankoffering for the recovery of his wife from a serious illness.

A Block of Shops and Offices are being erected at the corner of Bishopsgate Street and Middlesex Street, London, at a cost of £4,600. Messrs. Dale and Gadsdon are the architects.

The Memorial to the late Father Luke Rivington in the new Westminster Cathedral will take the form of an exact replica of the famous statue of St. Peter in his chair, which is in St. Peter's at Rome.

The New Westminster Presbyterian College at Cambridge, it is anticipated, will be opened on October 17th. The total cost of the establishment of the institution will not be much less than £40,000.

Two Stained Glass Windows have recently been unveiled in Airdrie E. U. Church. The subjects are "Christ as the good shepherd" and "Christ as the light of the world" (after Holman Hunt), and the artist is Mr. Norman M'Dougall, Glasgow.

Toplady Hall, which has been built in conjunction with the Whitfield Memorial Church, in Tottenham Court Road, and is the first of the buildings to be completed, has just been opened. The new church, it is expected, will be completed in November.

Stained Glass at Beverley Minster.—The five windows in the south front of the eastern transept of Beverley Minster have been filled with stained glass. The upper lancets illustrate the life of St. John of Beverley, and the lower ones the life of St. John the Baptist.

New Board Schools have been erected in the North Ward, Featherstone. The buildings are pleasantly situated in the midst of fields, and will accommodate 500 scholars. The cost, exclusive of furnishing, is about £3,500. Mr. W. H. Fearnley, of Featherstone, was the architect, Mr. Milson Dixon, of Ackworth, being the contractor for the whole of the work.

A Memorial at Delhi.—A project has been set on foot to obtain the necessary funds for erecting a memorial at Delhi to commemorate the services of the telegraph staff of that station on May 11th, 1857, when the members of the staff enabled the Government of the Punjaub to take steps which resulted in the saving of the province. The memorial will be an obelisk, 20ft. high, and is estimated to cost Rs. 1,500. The cost will be defrayed by voluntary subscriptions from the telegraph staff.

A New Church for "Auld Lichts" at Ayr is to be erected to contain 400 people. Mr. Allen Stevenson is the architect.

New Ponteland Bungalow.—The new cycling bungalow, erected and furnished at a cost of £1,800, at Ponteland, has just been opened.

A Memorial Chapel is to be built at Wembley, near Harrow, to contain the bodies removed from the church and burial ground of St. Mary, Moorfields.

M'Cheyne Memorial Free Church, Dundee, is being enlarged by the addition of a new suite of halls. A large organ has also been introduced into the church.

A New Presbyterian Church in Nottingham has just been erected in Mansfield Road at a cost of £4,500. The site has cost another £1,800.

Wormpit Public School was reopened last week, after its enlargement by the School Board of Forgan. The additions consist of three large class-rooms, added to the main building on the south side.

A Statue of Simon de Montfort.—An appeal is to be sent throughout the country during this and next month in the name of a most influential committee for funds to erect a statue of Simon de Montfort.

The Newport School Board proposes to erect new schools at the lower end of the town in the neighbourhood of the present Trinity Schools, and also others in the neighbourhood of the Marshes Road Schools.

The Statue of Mr. Gladstone that will be erected with the £4,500 left by the late Mr. William Roberts for the purpose, will be executed by Signor Mario Raggi, of 44, Osnaburgh Street, London, N.W.

A Competition at Bury.—The Bury Town Council have instructed the borough engineer to prepare conditions for competitive designs for a new infectious diseases hospital for Bury, to be erected at a cost of between £15,000 to £20,000.

Cottage Homes at Chester.—The Chester Board of Guardians are purchasing four plots of land at Chester for £704, upon which they will erect four dwelling houses at an estimated cost of £5,000, to be used as homes for the children of the Union.

The Memorial Portrait of the Late Mr. J. J. Colman, M.P., by Professor Herkomer, will not be unveiled in St. Andrew's Hall, Norwich, until after the Musical Festival, when the hall will be fitted up with temporary galleries, obscuring both the side walls.

The Autumn Liverpool Art Exhibition of pictures in oil and water colours and sculpture, under the auspices of the Corporation, was opened at the beginning of last week. There are altogether some 1,563 exhibits, comprising 760 oil paintings, 580 water-colour drawings, 110 pieces of sculpture, and 113 collections of miniatures on ivory, &c.

The Sanctuary of the Church of the Holy Name, Manchester, is being decorated afresh, and a number of new stained-glass windows are being inserted, the subject of which is "The Coronation of Our Blessed Lady." It is expected that the work will be finished by Rosary Sunday, when there will be special reopening services.

Causewayend Free Church, Aberdeen, has been reopened, after internal alterations and being decorated. The principal change has been the introduction of side galleries, by which means 120 additional seatings have been obtained. Messrs. D. Macandrew and Co. had the contract for the new galleries. The decorative work has been carried out by Messrs. Gordon and Watt.

Mr. Gladstone's Library.—£10,000 having been voted by the National Memorial Committee for the erection of a suitable library at Hawarden for Mr. Gladstone's collection of books, stored by himself, after months of labour, in a temporary structure near Hawarden Church, the trustees have arranged to proceed immediately with the work by accepting the tender of Messrs. Parker, of Chester.

A Free Church at Cumnock was opened last week.

The Yorkshire Archæological Society visited Skipton and Bolton Priory last Wednesday.

A Memorial Window has been placed in the east transept of Eastwood Parish Church, Pollokshaws.

The Foundation-Stone of a U.P. Church at Dalry, Galloway, was laid last week. The church will cost about £1,500.

Foundation Stones of the New Building for the Cardiff Y.M.C.A. were laid last week. The building will cost about £15,000.

New Buildings for the Runcorn Constitutional Club are to be erected on a prominent site in Greenway Road, Runcorn, from designs by Mr. Samuel Davies, M.S.A., Architect, of Runcorn and Frodsham.

New Town Hall for Batley.—The Batley Town Council are about to apply to the Local Government Board for sanction to borrow £31,500 for the erection of a new Town Hall, and £4,500 for market improvements.

The Aberdeen Free Presbytery Court has approved of the plans of a new place of worship for the congregation of the North Church, at an estimated cost of £7,800. The building will be seated for 760 persons.

The New Mission Church of St. Catherine's, West Bradford, near Clitheroe, was opened last week. The east window is of stained glass, the subject being "The Nativity," and has been executed by Messrs. Morris and Co., of London, from a design by the late Sir Edward Burne-Jones.

Find in Lincoln's Inn.—During some excavations which have recently been made in the vicinity of Lincoln's Inn Hall, in connection with drainage works, several fragments of old pottery, consisting of jars, candlesticks, a small green glass bottle, and a large bronze medal were discovered at some distance from the surface.

A New Presbyterian Church at Swindon, in Victoria Road, was opened last week. The building is in the early thirteenth century style, and cost about £6,000. It will accommodate about 900 persons on the ground floor, and there is a gallery in addition. Under the chapel schoolrooms are provided, giving accommodation for 300; there are also two large classrooms, vestry, &c.

New Council Chambers at Helensburgh are to be erected for the Row Parish Council. Mr. Robert Wemyss is the architect, and, including site, the cost will be £2,500. The accepted tenders were submitted by Mr. A. Trail, mason; Mr. John Dick, joiner; Mr. John Horn, plumber; Messrs. William Thom and Son, slaters; and Messrs. Mackay and Bryde, plasterers—all of Helensburgh.

The School Board of Glasgow have opened evening classes for elementary and advanced art and building construction at the High School of Glasgow, 30, Elmbank Street. The teachers of the art section are Messrs. William Paddock and John G. M'Kissock. The science section is under the instruction of Mr. D. Bennet Dobson, architect, assisted by Messrs. Charles Barrett and Robert B. Donald.

Improvements in Dundalk.—An inquiry was recently held in regard to the application of the Dundalk Urban District Council for sanction to borrow £17,206 for the erection of 133 artizans' dwellings, £800 for improving the Town Hall, £1,400 for purchasing the Grammar School and converting it into a free library, £650 for erecting market stalls, and £130 for the purchase of a fire escape and appliances. Opposition was raised to the first loan only.

Stratford-on-Avon Parish Church has lately been reseated, has had heating apparatus installed and alterations made to the organ, and the fabric has been repaired. The cost has been £3,415. Sir Theodore Martin has given £1,000 for the purpose of erecting a pulpit in the church in memory of his wife, the late Lady Martin (Helen Faucit). The architect, Mr. G. F. Bodley, R.A., is now preparing a design for this.

The Artists' Guild Exhibition.—Princess Christian and other members of the Royal Family will send loans to the Eleventh Artists' Guild Exhibition at the Albert Hall in November. Her Royal Highness offers prizes in the competition open to all amateurs. The section for "advanced art," under the direction of Mrs. E. M. Ward, is open to skilled artists, professional and otherwise. All kinds of artistic handicrafts can be exhibited in addition to pictorial art.

A Mission Room has just been opened in the hamlet of Newland Common, in the parish of Salwarpe, near Droitwich. The building is in the Gothic style, with lancet windows, and apse-ended east end, which serves as a chancel. It is built of red brick, with deep-red dressings, and covered with Broseley tiles. It will accommodate 150 persons. The architect is Mr. Lewis Sheppard, of Worcester, and the builder Mr. Allen Tolley, of Ladywood House, Salwarpe. The cost of the building and fittings is upwards of £300.

A New Palace at Yildiz is about to be erected for the Sultan of Turkey. It will be comparatively small and an exact copy of the Trianon. Munir Bey, the Ottoman ambassador in Paris, is purchasing a luxurious suite of furniture for it. The cost of building is estimated at about £30,000, and that of the furniture and internal decoration at £20,000. Three French electrical engineers are also engaged at Constantinople in examining the possibilities, advantages, and disadvantages of adopting the electric light for the city.

The New Catholic Cathedral at Westminster is now being roofed in. In the interior there will be a number of marble columns, which are intended to divide the chapels from the nave. The columns are thirty-four in number, and are to be 13ft. in height. The columns, which have been brought from Thessaly, were seized by the Turks among other spoils of war when they overran Thessaly two years ago. They were held by the Turks, and only given up after they had retired across the border.

St. Mark's Parish Church, Dublin, in Great Brunswick Street, erected in 1729, has just been renovated. The roof of the tower has been repaired, and the old dead wall round the church has been taken down and iron railing erected in its place. The interior of the church has been painted by Messrs. J. Gibson and Son, new windows have been placed in position, and the porches have been tiled by Messrs. Dockrell, Sons and Co., of South Great George's Street, Dublin. Funds are now required to provide a rectory, which will cost £1,000, and a new organ, which will cost £400.

The Boadicea Monument.—The pedestal is now being prepared for the reception of Mr. Hamo Thornycroft's spirited group of statuary representing Boadicea and her two daughters, of which a model was erected by the London County Council some time ago. The pedestal on which the model was placed was only 5ft. high, but the one that is now being constructed is to be 12ft. above the ground, at which elevation the group will doubtless look much more imposing than the model did. The pedestal is to be of grey granite. It is stated that the bronze casting, the work of Messrs. Singer and Co., of Frome, has cost £6,000.

Church Congress Exhibition.—The fourth Church Congress Exhibition of the Clergy and Artists' Association will be held in the studio at Leighton House (residence of the late Lord Leighton, P.R.A.), Holland Park Road, Kensington, W. The exhibition will remain open during Congress week, and will include, in addition to the examples of work executed under the auspices of the Association and by its members, representative examples of the work of individual artists and craftsmen working in churches. The famous Arab Hall and the collection of the late Lord Leighton's sketches and studies will be on view to visitors to the exhibition. The Bishop of Rochester will preside at a meeting of the Association to be held at Leighton House during the Congress week.

New Patents.

The following abridged description is specially drawn up for The Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all Patent matters.*

1338. Baths.—Patentee: T. W. Twyford, of Cliffe Vale Potteries, Hanley, Staffordshire. One side of the bath is made with an overhanging edge, which serves as a tray, and also to facilitate the fixing of the bath against a wall. The side is faced with wood to serve as a non-conductor of heat.

11,384. Chimney Tops.—Patentee: G. W. Taylor, of Holmes Terrace, Rawtenstall. Chimney tops are made with upper and lower double sections, having external holes opening into the annular spaces between the outer and inner pipes. The top of the lower annular space is closed over and communicates with the central freeway by holes.

1152. Bricks and Tiles. — Patentee: C. H. Collins, of Houckley Hill, Birmingham. Each brick or tile is made with a projecting rib at its lower edge and one side to protect the mortar joints from the effects of the weather. The ribs may be plain or ornamental, and the bricks or tiles may be used for walls, arches, chimneys, cooking ranges, fireplaces, lavatories, &c.

19,053. Moulding Bricks.—Patentees: C. R. Ivory, of Station Road, Teynham, Kent, and Eastwood and Co., Ltd., of Belvedere Road, Lambeth, London. A flap or striker is pivoted on a rod adjustable at one end by a bolt passing through a slotted-supporting bracket, and is held against the bricks in the moulds as the table revolves by a weight. A small quantity of water is supplied to each brick before it passes under the striker by a pipe fitted with a stop cock and a rose provided with a hinged bottom or valve normally closed by a spring; projections of the mould table strike a lever which acts on an arm of the hinged bottom.

"Architecture and Health."—Referring to the note under this heading which appeared in our last week's issue, it may be of interest to state that the firm referred to by Dr. Talbot, medical officer of health for Bow, which has secured immunity to their hands from the dreaded disease known as "phossy jaw," by their method of mixing and dipping, is R. Bell and Co., Limited, match manufacturers, Bromley-by-Bow.

The Central Police Office Buildings, Govan, have been undergoing alterations and extensions for the past year, and are well-nigh completed. The new bar is more comfortable and airy than the old, and is well fitted for the requirements of the department. A new entrance has been formed between the old and the new portion of the building, and the old one is being utilised as a private entrance to the chief constable's room. On the ground floor, immediately opposite the bar, is a large new muster hall. The new addition covers an area of 50ft. by 35ft., while the cells, which are situated to the rear of the main building, extend over 320 square yards. Each cell measures 10ft. by 7ft. by 11ft. high. The cells, which number twenty-six in all, with the addition of turnkey's pantry and casuality room, occupy two storeys. The old cells and other outhouses have been removed, and on the site there is being erected a one-storey building running from Albert Street to Broomloan Road, providing accommodation for the police stores, mortuary, tinsmith's workshop, and the lighting department.

New Companies.

C. Sands and Co., Limited.

This company was registered on Aug. 26th, by Henry Happold, 25, Wellington Street, Strand, W.C., with a capital of £1,600 in £1 shares, to acquire the business carried on at Duncan Street, Salford, as C. Sands and Co., and to carry on the business of dye, cement, varnish, blacking, and chemical manufacturers, tanners, leather merchants, &c. The first directors (to number not less than three nor more than five) are to be appointed by the subscribers. Remuneration as fixed by the company.

Wisewood Brick Company, Limited.

This company was registered on August 28th, by Waterlow and Sons, Limited, London Wall, E.C., with a capital of £3,000 in £10 shares, to carry on the business of brick, tile, pipe, and terra-cotta manufacturers, dealers in gannister, coal, sand, stone, lime, timber, &c. The first directors (to number not less than two nor more than four) are Frederick A. S. Crawshaw, Arthur T. Bescoby, Frederick U. Laycock, and William Frankish. Qualification, twenty shares.

Crapper's Brick Company, Limited.

This company was registered on Aug. 26th, by R. Fitch and Co., 42, Furnival Street, Holborn, with a capital of £5,250 in £10 shares, to acquire the business carried on by William Frankish and Marshall Nuttall, as the trustees of the will of Henry Crapper (deceased), and to carry on the business of brick, tile, and pipe manufacturers, &c. The first directors (to number not less than two nor more than five) are to be appointed by the subscribers. Qualification, £500. Remuneration as fixed by the company. Registered office, 29, York Street, Sheffield.

Ecclesall Hall Estate, Limited.

This company was registered on Aug. 26th, by Robert Fitch and Co., 42, Furnival Street, Holborn, with a capital of £20,000 in £10 shares, to acquire lands and buildings in the neighbourhood of Ecclesall, in the city of Sheffield, and in particular an estate known as the Ecclesall Hall Estate; to adopt an agreement with Edward Holmes and Robert Craig, and to carry on the business of builders, contractors, decorators, &c. The first directors (to number not less than three nor more than five) are John Hayhurst, Edward Holmes, and Robert Hunt. Qualification, £500. Remuneration as fixed by the company. Registered office, 29, York Street, Sheffield.

Digby Colliery Company, Limited.

This company was registered on August 25th, by Hind and Co., 8, Stone Buildings, E.C., with a capital of £275,000 in £1 shares, to acquire certain mines situate at Gedling, Carlton, Lambley, Arnold and elsewhere in Nottingham, upon the terms of certain agreements expressed to be made by this company with T. Potter, T. Bazley, K. Bazley, and M. E. Hardstaff; to develop and turn to account the said lands; to carry on business as colliery proprietors, coke manufacturers, coal merchants, waggon builders, iron masters, steel makers and converters, smelters, quarry owners, brick makers, engineers, gas makers, manufacturing chemists, metallurgists, and suppliers of electricity for the purposes of light, heat, motive power, or otherwise; as farmers and graziers, and to buy and sell agricultural products of every description; to turn to account any real or personal property, &c.; to search for, prospect, examine, explore, open, and work mines and land containing or supposed to contain minerals, metals, or precious stones; to seek and obtain information as to mines and mining districts, and to win, get, crush, dress, reduce, smelt, refine, and otherwise treat or prepare ore, metals, precious stones, and mineral substances of all kinds, &c. The subscribers (each one share) are: T. Bayley, The Park, Nottingham; A. C. C. Hubberty, Tollerton Hall, Nottingham; T. Potter, Daybrook House, Nottingham; E. P. Parry, Woodthorpe Grange, Nottingham; S. H. Sands, Lenton, Nottingham; C. H. Hill, Woodborough Hall, Nottingham; J. Hind, Nottingham. The first directors (of whom there shall be not less than three nor more than seven) are T. Bayley, Colonel C. C. Hubberty, C. H. Hill, E. Parry, and T. Potter. Qualification, £1,000. Remuneration, £1,000 per annum, divisible.

Thomas Briggs (Manchester), Limited.

This company was registered on August 24th, by G. Trenam, with a capital of £50,000 in £10 shares, to adopt and carry into effect an agreement expressed to be made between T. E. and R. F. Briggs and E. Neep of the one part and this company of the other part, for the acquisition of the business lately carried on by Thomas Briggs (deceased), tarpaulin merchant, manufacturer, and warehouseman, to develop and extend same, and, generally, to carry on in all or any of their respective branches the businesses of manufacturers of and dealers in tarpaulins, brattice cloth, paper, waterproof paper, and packing materials; and as canvas manufacturers, dealers in oil, pitch, sizes, varnishes and other materials for application to textile fabrics, sacks, bags, covers, sails, and other articles made from hemp, jute, flax, cotton, &c.; as weavers, cotton spinners, &c.; to deal in and manufacture every description of plant, machinery, apparatus, tools, utensils, commodities, articles and things necessary or useful for carrying on any of the above businesses; as spinners, dyers, doublers, combers, bleachers, finishers, &c.; to acquire and turn to account any patents, patent rights, and inventions, &c.; to acquire any mines, mining, water, and other rights, grants, leases, claims, concessions, options of purchase, alluvial ground, mineral deposits, &c., in any part of the world, and to carry on the business of a mining, milling, smelting, and trading company in all its branches; to lay out towns and villages; and to construct, maintain, and work rail and tram roads, wharves, docks, piers, warehouses, jetties, canals, &c. The signatories (each one share) are: T. E. Briggs, Dunham Massey, Cheshire; R. F. Miller, Manchester; E. Neep, 77a, Lord Street, Liverpool; F. Pownal, 32, Albert Road, Whalley Range; E. Webb, 250, Great Clowes Street, Manchester; W. P. Morison, 103, Gatley Road, Cheadle; G. McL. Doig, 25, Birch Lane, Longsight, Manchester. The first directors (of whom there shall be not less than three nor more than five) are T. E. Briggs, E. Webb, W. P. Morison, R. F. Miller, and E. Neep. Qualification, £100. Remuneration: T. E. Briggs, £800; E. Webb, £750; W. P. Morison, £500; R. F. Miller, £100; E. Neep, £100. Subsequent directors' remuneration to be fixed by the company.

Improvement Scheme at Blackburn.—Having abandoned their intention to enlarge their present town hall by taking in part of the market ground, the Blackburn Corporation have ordered the preparation of plans and estimates for the erection, near the fine new Technical School, of a great block of buildings, comprising large assembly hall, police courts, police station, and central fire station. This plan involves the widening of the ancient highway of Northgate to 60ft., and the sweeping away of several streets of poor property in the centre of the town.

The Congress of the Royal Institute of Public Health will be held in Blackpool from September 21st to 28th. The Marquis of Lorne will deliver his presidential address on Thursday, the 21st inst., at 11.30 a.m. Meetings will be held in four sections, these being (*a*) preventive medicine and vital statistics, (*b*) chemistry and meteorology, (*c*) engineering and building construction, and (*d*) municipal and parliamentary section. Conferences will also be held for medical officers of health, for veterinarians, for sanitary inspectors, and of ladies on domestic hygiene. The Health Exhibition of the Congress will open with the Congress, but will not close until October 14th. Excursions have also been arranged.

CURRENT PRICES.

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ...	per cwt.	1 4 6	1 5 8
Colza Oil, English ...	per cwt.	1 4 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 9 0	—
Linseed Oil	per cwt.	1 1 6	—
Neatsfoot Oil	per gal.	0 2 6	0 4 0
Petroleum, American ...	per gal.	0 0 6½	0 0 6⅝
Do., Russian ...	per gal.	0 0 5 3/8	0 0 5½
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 5 6	1 7 9
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 13 3	—
Glue	per cwt.	1 14 0	2 18 6
Lead, white, ground, carbonate	per cwt.	0 19 0	—
Do. red	per cwt.	0 17 6	—
Soda crystals	per ton	2 15 0	—
Shellac, orange	per cwt.	3 4 0	3 5 0
Pumice stone, ...	do.	0 8 9	—

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ...	per ton	88 0 0	—
Iron, bar, Staffs. in London	do.	8 5 0	9 10 0
Do. Galvanised Corrugated sheet ...	do.	13 0 0	13 10 0
Lead, pig, Spanish ...	do.	15 3 9	15 7 6
Do. English common brands	do.	15 11 3	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	16 10 0	—
Do. pipe	do.	17 5 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 0 0	10 0 0
Do. floor brads	do.	8 15 0	9 15 0
Tin, Foreign	do.	144 2 6	144 12 6
Do. English ingots ...	do.	147 10 0	—
Zinc, sheets, English ...	do.	140 0 0	28 10 0
Do. Veille Montaigne ...	do.	31 0 0	—
Do. Spelter	do.	23 10 0	23 17 6

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	do.	4 0 0	6 10 0
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd.	do.	12 0 0	12 5 0
Do. do. unsorted	do.	12 5 0	—
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	10 10 0	16 0 0
Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	8 10 0	10 15 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	10 10 0	14 10 0
Do. White Sea	do.	13 0 0	—
Do. Quebec Pine, 1st...	do.	20 0 0	23 15 0
Do. do. 2nd	do.	13 15 0	15 15 0
Do. do. 3rd &c.	do.	7 15 0	9 15 0
Do. Canadian Spruce, 1st	do.	9 0 0	10 5 0
Do. do. 3rd & 2nd	do.	6 5 0	7 15 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	6 7 6	8 5 0
Flooring Boards, 1 in. prepared, 1st	per square	0 10 0	—
Do. 2nd...	do.	0 9 0	—
Do 3rd &c.	do.	0 8 6	—

HARD WOODS.

		£ s. d.	£ s. d.
Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4	0 0 4½
Do. Honduras	do.	0 0 3½	—
Do. Tobasco	do.	0 0 4¾	0 0 5½
Elm, Quebec	per load	4 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 29/32	—
Do. African ...	do.	0 0 4 7/16	—
Do. St. Domingo ...	do.	0 0 5¼	—
Do. Tobasco ...	do.	0 0 4 15/16—6 1/32	
Oak, Dantzic and Memel	per load	3 5 0	3 5 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	9 5 0	15 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown...	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 2 6	4

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work. An asterisk (*) signifies accepted.

BASINGSTOKE.—For the erection of the Isolation Hospital, Basingstoke, for the Urban District Council. Mr. James Gibson, architect, Basingstoke. Quantities by the architect:—

Martin, Wells, and Co.	£6,100 0	Musselwhite & Son	£5,689 0
J. Thumwood... ...	5,769 14	Bottrill and Son ..	5,578 0
		Mc.Carthy E. Fitt*	5,555 0

BLACKBURN.—Accepted for the erection of store premises, for the Brewery Company, Limited. Mr. J. Bertwistle, architect, Tackett's-street, Blackburn. Quantities by the architect:—

Builders' Work.

John Boland, Whalley New-road, Blackburn ... £542

Fireproof Work.

The Phœnix Fireproof Company, Ardwick, Manchester £791

ENFIELD.—For the construction of underground convenience, Market-place, Enfield Town, for the Urban District Council. Mr. Richard Collins, surveyor, Council Offices, Enfield:—

Fleming and Co.... ...	£1,190	Finch and Co.	£650
Bolding and Sons ...	1,140	E. J. Betts, Enfield Highway*	595
Doulton and Co.	685		

FARNHAM.—For re-erection of "The Grenadier" public-house, Heath End, Farnham, for the Army and Navy Co-operative Breweries. Messrs. Friend and Lloyd, architects, Aldershot:—

Martin, Wells, and Co.	£1,320 0	S. W. Gibbs...	£785 10
J. W. Gunstone ...	952 10	F. Knight	755 0
		W. L. Edgoose	715 0

GRAYS.—For alterations and additions to the Grays Co-operative Industrial and Provident Society, Limited, Grays, Essex. Mr. Christopher M. Shiner, architect, 3, Bond-court, Walbrook, E.C.:—

F. and E. Davey... ...	£5,230	Sims and Woods	£3,380
Wm. Potter	3,600	J. J. Lawrence	3,125

HALIFAX.—Accepted for the erection of school and house, Southowram Bank. Mr. J. F. Walsh, architect, Lancashire and Yorkshire Bank-chambers, Halifax:—

Mason.—Adam Foster	£808 0 0
Concretor.—L. Lister, Hipperholme ...	63 10 0
Slater.—L. Lister, Hipperholme	97 0 0
Plasterer.—L. Lister, Hipperholme ...	64 15 0
Joiner.—J. Booth	250 13 9
Plumbers.—Fawley and Sons, Halifax ...	107 0 0
Heaters.—Fawley and Sons, Halifax ...	66 0 0

HARTLEY WINTNEY (Hants).—Accepted for the execution of sewage filtration works, for the Hartley Wintney Rural District Council. Messrs. Fairbank and Son, engineers, 13, Lendal, York. Quantities by engineers:—

Thomas Bell, Market Weighton, York ... £2,079 4 8

HERNE BAY.—For the erection of the Passmore Edwards' convalescent home for railway men for the trustees. Mr. A. Saxon Snell, architect. Quantities by Mr. Bernard Swinstead:—

W. Downs...	£9,890 0	Peacock Bros.... ...	£8,608 0
Parramore	9,741 0	J. Carmichael... ...	8,544 0
W. J. Adcock	9,205 18	Spencer, Santo, and Co.	8,504 0
Denne and Son ...	9,200 0	Wall and Co., Kentish Town*	8,367 0
T. G. Sharpington	9,059 0		
W. W. Martin.. ...	8,934 0		

LONDON.—For additions to London and County Bank, Harrow-road, Paddington, W. Mr. Thomas Dinwiddy, architect, 54, Parliament-street and Greenwich:—

F. T. Chinchen	£2,594	W. Mills*...	£2,449
Ransom and Co.... ...	2,510		

LONDON.—For new London and County Bank branch and business premises at East Greenwich. Mr. T. Norman Dinwiddy, architect, 54, Parliament-street and Greenwich:—

J. and A. Oldman ...	£3,166	W. Mills	£3,065
Jones and Groves ...	3,155		

LONDON, S.E.—For the erection of thirty-eight working class dwellings, Lanford-street, Woodpecker-road, Deptford, S.E., for the Surrey Commercial Docks Co. Messrs. Humphreys, Davies, and Co., architects:—

Foster and Dicksee ...	£29,992	Perry and Co.	26,974
Wallis and Slater ...	29,644	Holliday and Greenwood	26,949
Howell J. Williams ...	28,250	Kirk and Randall* ...	26,833
Holloway Bros.	27,918	Killby and Gayford ...	26,820
Wallis and Sons... ...	27,827		
Smith and Sons	27,491		

TARVIN (Cheshire).—Accepted for the construction of waterworks, for the District Council. Mr. H. B. Killon, C.E., 22, Cooper-street, Manchester:—

Contract No. 1.

C. John Nevitt, Bailey-street, Stafford ... £3,174 8 5

Contract No. 2.

C. John Nevitt, Bailey-street, Stafford ... 1,154 18 6

CONTRACTS OPEN.

EAST SUSSEX COUNTY COUNCIL.
TO BUILDERS.

TENDERS are invited for the proposed ALTERATION and EXTENSION of the COUNTY HALL, Lewes.

Plans, specifications, and conditions of contract may be seen at the County Surveyor's Office, Lewes, between the hours of TEN a.m. and FOUR p.m.; SATURDAYS ONE p.m.

Quantities may be obtained on application to Mr F. J. WOOD, County Surveyor, County Hall, Lewes, on payment of a deposit of Three Guineas, which deposit will be returned on receipt of a bonâ-fide Tender.

Tenders, endorsed "Tender for County Hall Extension," to be addressed to the undersigned and delivered not later than TUESDAY, OCTOBER 3rd, 1899.

The County Council does not bind itself to accept the lowest or any Tender, or to pay any expenses in connection with the preparation thereof.

F. MERRIFIELD,
Clerk to the County Council.

County Hall, Lewes,
September, 1899.

THE VESTRY of the PARISH of ST. MARY, BATTERSEA.
ELECTRIC GENERATING STATION AND WORKS.

The Vestry are prepared to receive TENDERS for IRON and STEELWORK required for the above, to specifications as follows:—

No. 1. Cast-iron Stanchions, Columns, Cantilevers, Chimney Cap.
No. 2. Wrought-iron Floor Plates with Hoppers and Stayrods, and Chequered Plates with Cast-iron Bearers.
No. 3. Wrought-iron Doors and Windows.
No. 4. Steel Girders, Joists, Bolts, &c.
No. 5. Roofs over Engine Room and Boiler House.

Specifications and forms of Tender and contract can be obtained, and the drawings inspected, upon application at the Municipal-buildings, Lavender Hill, S.W., between the hours of TEN a.m. and FOUR p.m. (Saturdays TEN a.m. to TWELVE noon).

Tenders, sealed, and marked on the outside "Electric Generating Station and Works—Tender for——," must be addressed to the undersigned, and delivered at the Municipal-buildings not later than TWELVE o'clock noon on WEDNESDAY, SEPTEMBER 20th, 1899.

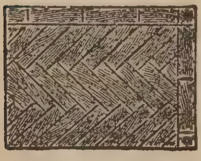
The contract will be prepared by, and at the expense of, the Vestry.

Persons tendering will be required to declare in their Tender that they pay the Trade Union rate of wages, &c., and must append to the Tender a schedule of the wages paid to the various classes of workmen employed by them at the time of tendering.

The Vestry do not bind themselves to accept the lowest or any Tender.

By order of the Vestry,
W. MARCUS WILKINS,
Vestry Clerk.

Municipal Buildings,
Lavender Hill,
September, 1899.



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Polished Granite Manufacturers,
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London Office: 64, FINSBURY PAVEMENT, E.C.
Quarries: PETERHEAD, N.B.

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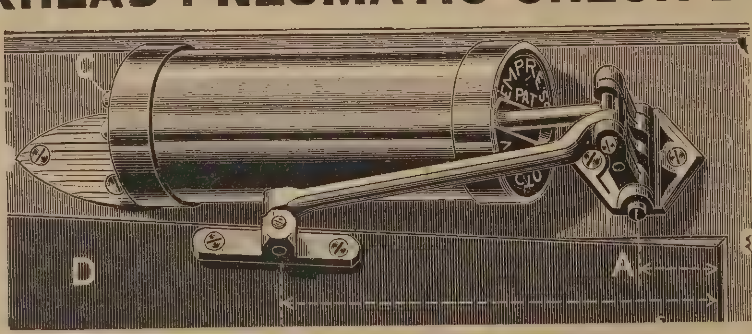
THE "EMPRESS VICTOR"
ROBERT ADAMS (Pat.)



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SEPTEMBER 13TH, 1899.

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THE LATEST PATENT HAS DOUBLE THE EXTRACTING POWER OF EARLIER FORMS AND IS ONE-HALF THE COST.

ROBT. BOYLE & SON, LTD., 64, Holborn Viaduct, LONDON; & 110, Bothwell St., GLASGOW.

See Large Advertisement, Back Page, Monthly.

THE PROBLEM SOLVED!

ORDINARY WOOD RENDERED FIRE-RESISTING THROUGHOUT WITHOUT AFFECTING ITS UTILITY AS A BUILDING MATERIAL.

The London Non-Flammable Wood Co. Ltd.

who have recently introduced into Europe the process now being so largely used in America, have erected large works in this country, and are now taking Orders for the supply of their

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The whole of the Carpentry and Joinery in the following notable buildings in New York, amongst others, consists of NON-FLAMMABLE WOOD:—

THE COMMERCIAL CABLE BUILDING,
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. . and . .
THE R. G. DUNN BUILDING.

NON-FLAMMABLE WOOD has been tested by H.M. Admiralty, and large Orders have been given by H.M. Government.

Quotations on receipt of Requirements, Address, &c.

THE LONDON NON-FLAMMABLE WOOD COMPANY Limited,

2, Army and Navy Mansions, Victoria Street, London, S.W.

METHODS OF PILING FOUNDATIONS.

By G. ELLIS.

(Concluded from page xxvi., No. CCXXXVIII.)

FIGS. 9 and 10 are respectively a sectional elevation and plan of the timbering employed when the bad soil is of great depth. It consists of a triple row of piles driven under the site of each wall at about 3ft. centres, and these may vary in length from 12ft. to 25ft. according to the load. The heads of the piles, after levelling, are connected, as in the former case, by stout balk sleepers, notched and spiked to them. These sleepers are half-notched over each other at the return or angles; on top of these are laid two sets of stout elm planks, grid fashion, and the whole of the timber work, to a depth of 6in. below the sleepers is embedded in concrete. Elm is the most lasting wood to employ in these circumstances, but it is very difficult to get sufficiently straight-grained for piles, and when cut across the fibres it frequently shivers under the ram. Formerly oak and beech were much used for that purpose, but more recently the Australian woods, Karri-Karri, Jarrah, and Blue-gum have been employed with good results.

The afore-mentioned methods of forming foundations are not safely applicable when the structure to be raised is of very great weight, and rivers or deep cuttings that might at times drain the surrounding soil are within short distances of the site. In such cases piers of brickwork or masonry must be raised from the hard bottom, through the soft strata, to act as abutments to arches, or supports for girders, and they must be of sufficient strength to carry the superstructure.

There are three usual methods of sinking shafts for the purpose of building these piers: (1st) A timber lined or "cleaded shaft," (2nd) an under-pinned brick shaft, (3rd) iron cylinders sunk in sections. The last named, when the firm ground is reached, are usually filled up solid with concrete and themselves form an integral part of the pier. They are most usefully employed when the soil is too wet to allow of the other two methods being successfully employed. A timbered shaft is used when the soil to be pierced is tolerably dry, but loose and treacherous. It is kept as small as possible for the sake of economy, and is usually rectangular in plan, the longer section running in the direction of the wall. The reason of this is that there is no need to make the shaft wider than to give the bricklayer foot room on each side of the footings, but extra length is required for the excavators to have a "throw" for the core, which is passed upwards in stages. A very usual size is 4ft. by 6ft. The thickness of the lining, technically "cleadings," and of the supporting framework—the "settings"—depends upon the character of the soil and the depth of the sinking. It is usual to double the thickness of the cleading after a depth of 30ft. is reached, and to reduce the distance between the settings. In dry clays 1in. to 1½in. cleadings and 4in. by 4in. settings may be used. In quicksands 3in. to 4in. cleading and 7in. to 9in. square settings will be required.

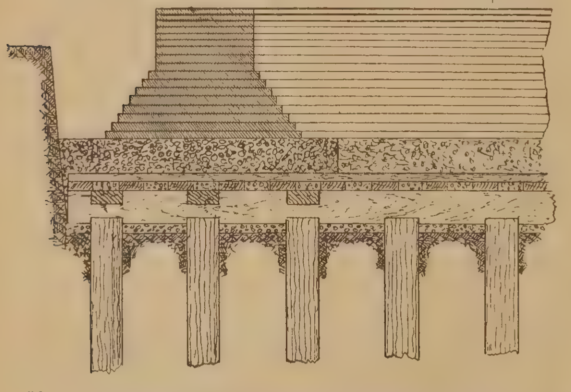

Fig. 9.—SECTIONAL ELEVATION OF FRICTION PILES.

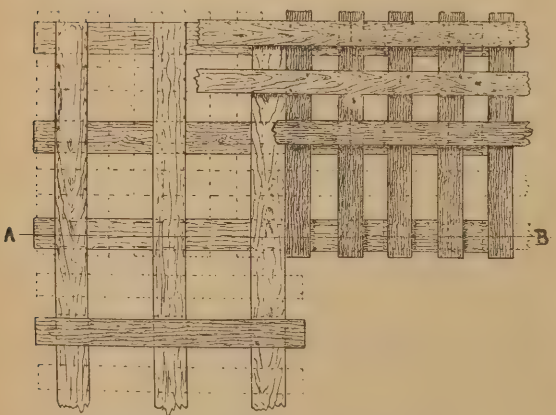

Fig. 10.—PLAN OF FRICTION PILES.

The method of making the shaft is to take out 3ft. or 4ft. of ground to the size required, then line the two long sides with cleading, driving the boards down into the bottom a short depth to make them stand. The boards average 4ft. in length, but the first set should be longer so as to project from the ground as a protection to the mouth of the shaft. Two setting pieces are strutted across the face of the boards at the ground level, then the two ends are lined similarly, and the end settings are cut tight in between the sides and driven home hard on the boards; they are fixed in this position by stout cleats spiked on the face of the side settings. Another "lift" of core is then taken out, and a second series of cleading and setting inserted, the upper ends of this set overlapping by some 6in., the lower ends of the first, the setting frame thus nipping the two sets (see section, Fig. 12). This process is repeated until the firm ground is reached, the frames being ranged in bays of from 3ft. to 6ft. apart, and kept in position by stout props at each corner, running from frame to frame throughout the depth.

When the shaft has been sunk about 12ft. there is considerable danger of the whole thing slipping down the shaft through the weight of the material; it then becomes necessary to throw two balks across the opening, and bolt long planks to them, reaching to the bottom of the shaft. These planks are spiked to the settings and effectually prevent any settlement; longer ones are of course substituted as the depth increases: the bottom setting being strutted from below whilst the change is executed. Fig. 11 is a plan, and Fig. 12 a vertical section of a timbered shaft.

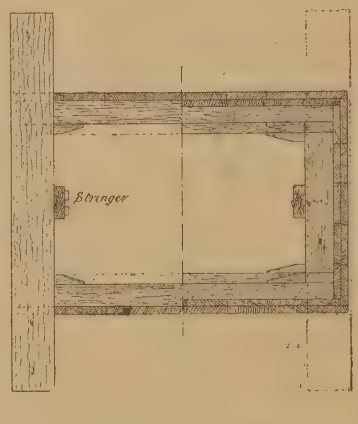

Fig. 11.—PLAN OF TIMBERING FOR A SHAFT.

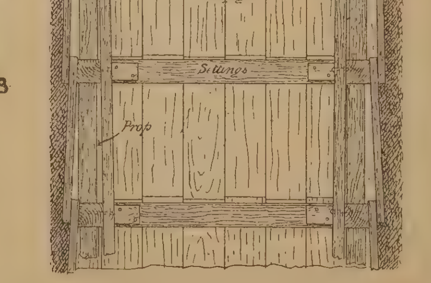

Fig. 12.—VERTICAL SECTION OF TIMBERING FOR A SHAFT.

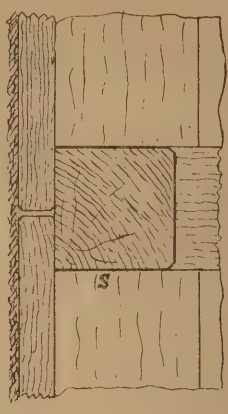

Fig. 13.—ALTERNATIVE METHOD OF INSERTING CLEADING.

In Fig. 13 an alternative method of arranging the cleading is shown. In this case the frame is laid down first at the bottom of the first "lift" of earth, and the boards are driven down behind the frame to a depth of half its thickness; the frame is then tightened up with wedges, which are cut off flush, and the cleats are nailed over them; when the next lift has been got out the second set of cleadings is worked up behind the top frame, as shown in the illustration, until they butt against the first set, and so on. This method gives more room in the "working," but takes much longer to execute and is not so satisfactory, for if the boards are of unequal thickness the thinner ones will slip out. Brick shafts are sunk through soils containing much water; timber shafts would allow the water to percolate into the excavation and fill it, but brick shafts, built in quick setting cement, form an impervious lining to the shaft as it advances.

The method followed, with slight variations according to circumstances, is to prepare several curbs, of 6in. elm, of an outside diameter equal to the size of the proposed shaft. These curbs are made in segments of 2ft. or 3ft. long, lap jointed, and generally straight on the inside; an excavation is made slightly larger than the curb, and of as great a depth as the nature of the soil will allow; then the curb, sent down in segments, is spiked together at the bottom, and laid round the shaft, carefully levelled, and the brick lining commenced on it, the bricks being laid in half-brick rings, breaking joint. This is carried up to the top of the shaft; then the excavators take out the centre core, leaving the ring of earth under the curb. When they have gone as deep as is considered safe, a stout sole piece is bedded in the centre of the bottom; and raking struts are taken from it up to the underside of the curb, three being usually thought sufficient. When these are wedged up firm, the supporting earth is taken out, another curb is laid at the bottom, and the brickwork is built up from it to the underside of the upper curb. This process is repeated until the requisite depth is reached, when the shaft is filled in with brickwork or concrete.

THE SANITARY INSTITUTE.

CONGRESS AND HEALTH EXHIBITION.

[By Our Special Correspondent.]

(Continued from page xxxv., No. CCXXXIX.)

A BRIEF ACCOUNT of the Health Exhibition, which formed an important feature of the recent Sanitary Congress at Southampton, was given in our last week's issue. We resume this week our review of some of the more notable exhibits.

The entrance porch of the exhibition was erected entirely by the Mack Patent Fire and Sound Proof Slab Company. This firm had also a good exhibit in the great hall, consisting of various kinds of fire and sound proof partitions, floors, ceilings, roofs, &c., specially adapted for hospitals, schools, drying rooms, and other large establishments. They claim a great saving of time by their process. The wall slabs are made with an asbestos backing and are used instead of the ordinary mode of plastering walls. Another excellent variety was their tiles embedded in slabs, which appeared cleanly and easily adapted to any house. We understand that this firm, which, by the way, was awarded a bronze medal, has entirely fitted up the German Emperor's palace at Stutgart, and also the municipal offices for the Paris Exhibition next year, the whole 900ft. frontage being entirely fitted with these slabs.

Messrs. Oates and Green Limited, Halifax, who by the way obtained the silver medal (the highest award) at the Lincoln Exhibition a few weeks ago, had two excellent stands here. Among other things, we noted a triple taper urinal range in salt glaze as supplied to Windsor Castle. A sanitary manger with improved fastening. This latter obtained a bronze medal. Here also was a range of three latrines with each pan trapped and automatically flushed. It is only fair to say here that Messrs. Oates and Green had several of their latrines broken in transit, otherwise it was their intention to show a range of six latrines. Had they thus shown we have no hesitation in saying they would have obtained an award. We will watch the result of this exhibit at the next show. Down stairs this firm had fitted up a sanitary cowshed, which was occupied by cows belonging to the Model Dairy. This shed had salt glazed trough and manger, with a continuous flow of clean water through the drinking trough, the floor was laid with blue bricks. This exhibit was well worthy of the judge's notice.

The International Purification Syndicate had an interesting exhibit in a working model of the Southwold oxidising bacterial filter, showing actual thickness of bed and method of uniformly and intermittently distributing the anærobic effluent from the sludge peptonising bed by means of the Candy-Earnh Sprinkler. This system of Polarite oxidation for the treatment of sewage appears to be most satisfactory in that the cost is considerably less than any other system, it does away with the use of chemicals, and the space required is a great deal less than is ordinarily required for a sewage works. Here also was shown a full-size intermitter for 100,000 gallons flow, discharging every few minutes according to rate of flow. This intermitter is for resting and working filter beds from a channel; the only alteration needed being variation in the size of the bottom valve to suit the quantity of sewage to be purified. The whole thing is perfectly simple with no complicated parts. This is evidently a great advance in the bacterial treatment of sewage, a question that at present is troubling many local councils. Dr. Griffiths, F.R.S., F.C.S., reported that sewage passed through the Polarite oxidising bed was ninety-seven times purer than the effluent from an open septic tank, and that it contained no ptomaines at all. Public health officers should give the attention to this system that it undoubtedly deserves.

The Hard York Stone Company, whose stand was in the central hall, had laid down a short footpath, about 12ft. long, of their non-slip flags. In appearance they resemble ordinary York stone, but the makers claim that they are of greater durability, as they are made from the noted Silex York stone, a natural product obtained from the lowest beds in the county, and the very best stone of its class, its crushing strain being 2,200 tons per cubic foot. A peculiar feature of this stone is its inability to become slippery like granite or other similar stones. Another feature of the hard York stone, which ordinary York stone lacks, is its perfect freedom from laminations which are inseparable from the latter. It is evident that the stone is becoming popular by the fact that civil engineers, municipal authorities, and others who have adopted it speak most highly as to the result, it being cheaper than natural stone, yet having all the advantages of the manufactured stone.

Messrs. J. L. Wade & Co. were exhibiting their Patent Automatic Disinfector, a remarkably simple and easily adapted machine, most suitable for cisterns, water-closets, &c. The particular claims made for the Disinfector are as follows:—(1) It flushes, deodorises, and disinfects by one and the same operation, affording the means of preventing in urinals and w.c.'s the disagreeable odour arising from the slimy deposit known as "furring." (2) It acts automatically. (3) The simplicity of its mechanism renders it free from liability to get out of order. (4) It fits any flush tank or cistern. (5) It lasts from one to three years, during which time it requires no attention. (6) It is very economical, as it can be recharged with the disinfectant at a cost of from one to two shillings. Messrs. Wade also had several of their well-known disinfectant powders and their sulphur candles. This well-known firm are large contractors to the different Government boards.

The Frode Company, Limited, had their preparations on view for cleansing painted and varnished buildings, rooms, &c. This, to our mind, is not only a cheap but a most effective and clean process for cleansing houses, walls, &c. It is used on many of our principal railways, notably the L.B. and S.C. Railway, the District Railway, the North-Eastern, and others. The Allan Line of steamers, which carries passengers out and brings cattle home, has, after many trials, finally adopted "Froda" for the purpose of cleaning and washing the paint and woodwork of the ships on their return to Liverpool, and has found it most satisfactory in results.

C. W. Outram & Co., Woodville. This new firm, whom we do not remember to have seen in previous exhibitions, had a very good display, and we were pleased to see that the judges considered the "Aquarius" closet on exhibition by this firm worthy of a bronze medal. They also had a patent water waste preventer, which answered admirably the purpose claimed for it.

The Albion Clay Co., Ltd., had a large and varied show of their various specialities, notably the Syke's Patent Screw Joint Pipes, Syke's Patent Interceptor Street Gullies, and Sankey's Patent Gulley.

The Sanitary Lead Lining Co. were to the fore with their admirable process, which created much interest amongst the many visitors interested in the allied trades. This company has a great future before it.

Messrs. Major & Co., Limited, Hull, were showing their new disinfectant "Encryl," which seems to be catching on, not only in general public works, but also in the bath room, where their toilet preparations are becoming popular.

Messrs. Burt, Boulton and Haywood had an interesting exhibit showing the process of creosoting timber paving blocks; also a model of a rapid mixer for breweries, chemical sewage, and other works.

The following is a full list of awards:—

Silver Medals.—Brown and Polson, London, E.C., for corn flour for invalids; Burroughs, Wellcome, and Co., London, E.C., for disinfecting soloids; Burt, Boulton, and Haywood, London, E.C., for products of coal tar and ammoniacal liquor; Cadbury Bros., Bournville, near Birmingham, for cocoa; F. C. Calvert and Co., Manchester, for carbolic acid preparations; Chalmers and Co., Red Hill, for van-shaped ambulance; J. Defries and Sons, Limited, London, E.C., for Equifex steam disinfector; W. Glover and Sons, Limited, Warwick, for Glover's tipping dust van; United Alkali Co., Limited, Liverpool, for chloros; Webb's Engineering Co., Limited, London, E.C., for anti-splash excel silver nozzles; and Wilson and Stockall, Bury, Lancs., for brougham ambulance.

Bronze Medals.—Aerators Limited, London, E.C., for Sparklets; Robert Adams (four medals), London, S.E., for the "Crown Victor" and "London Victor" oil check spring hinges, the "City" and "Cushion Victor" pneumatic silent check spring hinges, the "E. R. A." reversible window fittings, and "X. I. T." bolts; Albion Clay Company, Limited (three medals), Woodville, Burton-on-Trent, for Sykes' access pipes and junctions, Sykes' street gully, and "Accomo" yard gully; Alione Company, Norwood, S.E., for sick room apparel; Anderson Patent Pipe Coupling Syndicate, London, W.C., for Anderson's pipe coupling; Boake, Roberts, and Co., Stratford, E., for liquid sulphur dioxide; Joseph Cliff and Sons (four medals), London, S.E., for Shoppee's dove-tailed bricks, Shepwood partition bricks, Wyvurst's channels, and Borders's glazed stoneware manholes; Doulton and Co. Limited (two medals), Lambeth, S.E., for "Compact" washdown closet, and vitreous porcelain enamelled bath; J. Duckett and Sons, Limited (three medals), Burnley, Lancs., for latrine with isolated pans, "Clencher" wash-down closet, and the "Rapid" slop water closet; the Hard York Patent Stone Co., Light Cliffe, near Halifax, for the "Non-slip" hard York stone; Herbert James Holt (two medals), Bevois Valley, Southampton, for Cullis and Beavan's combined sink standard and waste, and Ewart's geyser; Hooper and Ashby (two medals), Southampton, for Callender's pure bitumen, for linings, and Barron's channel bends; Geo. Howson and Sons, Limited (three medals), Hanley, for white enamelled fireclay wash tubs, combination fireclay sink with wash board, and range of white enamelled urinals; George Jennings (three medals), Lambeth, S.E., for "Era" valve closet, white glazed Dorset clay channels, and porcelain bath with duplex supply valves; J. A. King and Co., London, E., for the "Mack" patent fireproof plaster slabs; B. Kühn, London, E.C., for chinosol; Lockerbie and Wilkinson, Limited, Birmingham, for abattoir fittings; Oates and Green, Limited (two medals), Halifax, for salt-glazed wash tub and rubber combined, and improved glazed stoneware manger; C. W. Outram and Co., Woodville, Burton-on-Trent, for aquarius water closet and fittings; Parke, Davis, and Co., London, W., for anti-diphtheria serum of high potency; T. E. Peckett, Sheffield, for combined knife and fork cleaner; G. A. Permain and Co., Southampton, for inlaid linoleum; Sanitary Lead Lining and Pipe Bending Company, Chelsea, S.W., for lead-lined iron pipes; W. Summerscales and Son, Limited (three medals), Keighley, Yorks, for washing machine for disinfecting under steam pressure, improved "Challenge" ironing machine, and "Body" ironing machine; and R. J. and H. Wilder, Wallingford, Berks, for Wilder's spring tumbler cart.

Selected for Practical Trial.—Anti-Vibration Incandescent Lighting Company, Bradford, for anti-vibration fittings; H. Barrand, Halifax, for cascade filter for removing lead from water; Brand and Co., Limited, London, S.W., for nutrient powder; J. Cliff and Sons, London, S.E., for architectural terra-cotta; The English Paintoff Company, London, S.W., for paint removing compound; The Esywosh Company, Limited, Plymouth, for "Mabin-Pett" improved perforated fire bar; Formalin Hygienic Company, Limited, London, E.C., for alformant "B" and Trillat's autoclave; T. G. Lyon, M.A., M.D., London, S.W., for Lyon-Cadet ventilating apparatus; Parke, Davis and Co., London, W., for beef meal; Alice Patchett, Birmingham, for mortar testing apparatus; G. A. Permain and Co., Southampton, for kapok vegetable wool for mattresses; Reeves' Chemical Sanitation Company, Limited, London, W., for system of sewer deodorisation; H. Rossell and Company, Limited, Sheffield, for automatic smoke preventer; Walter Sharratt, Clayton, Manchester, for formaldehyde regenerator; Sissons Brothers and Company, Limited, Hull, for Hall's sanitary washable distemper; Ernest Smith, London, S.E., for Smith's iron-jointed stoneware pipe; C. J. Van Houten and Son, London, E.C., for cocoa; and Webb's Engineering Company, 11, Poultry, E., sewer gas extractor.

Letter of Recognition.—Southampton Corporation, for sections and systems of sewers.

(*To be continued.*)

Masters and Men.

The Bristol Deal Runners' Dispute.—At Bristol the strike of four hundred deal runners terminated last week by the merchants giving the men the option of accepting threepence a day extra, or half an hour less work, instead of an advance of wages. The men accepted the advance, but get three hours' less work on Saturday.

The Labourers' Strike at Leicester.—The master builders of Leicester having, after a twenty weeks' strike of the labourers for an advance of a halfpenny per hour in wages, agreed to refer the dispute to arbitration, the men on strike have passed a resolution in favour of such a course. The matter will now be referred to the men not on strike, who at non-federated shops are in receipt of 6½d. per hour.

Settlement of the Danish Lock-Out.—The Builders' Carpenters' Union, which does not belong to the Trade Union Alliance and consequently has taken no part in the recent negotiations, having given its adhesion to the terms of the agreement for the termination of the great lock-out, the latter was finally signed by representatives of employers and men last week. Work was resumed last Thursday. The conflict, so far as we understand the position, has ended in the resumption of work on the basis of a compromise. The conflict involved 35,000 men.

The Manchester Plasterers' Labourers Dispute.—The dispute between the plasterers' labourers of Manchester and their employers, which has lasted since last March, was settled at a joint conference last week. The demand of the workmen was for a halfpenny an hour advance, and the employers at the last conference offered a farthing an hour at once and another farthing in six months. This offer was refused, but in the meantime the operatives decided to accept it, and a final agreement was come to on the terms suggested by the employers. The operative plasterers have obtained an advance of a halfpenny per hour at once and another halfpenny in six months.

The Building Dispute.—In Leeds some time ago the London Order of Bricklayers made a demand for an advance of a penny per hour. The representatives of the Employers' Federation, in conference with the men, agreed to concede a halfpenny, but on a vote of the whole of the federated employers being taken, a large majority stood out against the proposal. The position thus arrived at was complicated by the fact that the Manchester Order of Bricklayers had taken no part in the demand for an advance. Now, however, an effort is being made to bring the two societies of workmen into agreement, with a view to their entering upon joint action in the matter. The master builders of Hull had an important conference last Wednesday with representatives of the operatives, with the object of settling the conditions upon which to terminate the present lock-out in the building trade of the city. The meeting lasted four hours, the most important point discussed being the working of Union with non-Union operatives at present in the masters' employ. The employers declined to discharge these men, and the Unionists absolutely refused to return to work unless they were discharged. A suggestion was made by the masters that the men should work with non-Unionists, and that all hands wanted in future should be obtained from the operatives' association. This suggestion was discussed, and ultimately it was decided to take the feeling of the operatives' respective societies. The meeting was adjourned till to-day. Judging by the present temper of the men there is little or no prospect of the employers' suggestion being accepted.

Cwmbran Brickmakers' Strike.—At the Cymbran Petty Sessions last week the magistrates had before them the case of three brickmakers employed by the Cwmbran Brick Company, who struck work without giving a week's notice. The men's names were George Dean, James Richardson, and David Watkins, and they were employed as fillers of clay. As a consequence of their absenting themselves the works, which employ forty men and boys, were stopped for three days, and the company claimed 40s. from each as damages, but really, according to the managing director, they lost £10 or £12. The defendants received 5d. per hour, and were paid weekly, the wages amounting to 23s. 6d., and they left after making two applications for an increase of wages, which were both declined. The rule of the works was a week's notice, and the men had been employed there two years. The magistrates decided that the men must pay the 40s. each which the company claimed, and the Court costs, 5s. 6d. each; in default of a distress, fourteen days' imprisonment.

Wages and Working Hours in Glasgow.—The Corporation of Glasgow have adopted the following minutes of the Statute Labour Committee, with regard to the working conditions of their employés:—The Sub-Committee unanimously agreed to recommend (1) that the wages of the masons' labourers, which at present are at the rate of 23s. 9d. per week, be increased to 25s. per week for the nine months of the year during which they work fifty-seven hours per week, and to 24s. per week during the three winter months, when the working hours are only fifty-one per week, and when they are paid for time not wrought through stress of weather; and (2) that the wages of the ordinary labourers of the department, which at present are 21s. per week, be increased to 22s. per week for the nine months of the year during which, like the masons' labourers, they work fifty-seven hours per week, and that for the remaining three months during winter, when they work only fifty-one hours per week, and when they are paid for time not wrought through stress of weather, the wages remain at 21s. per week. The assistant Master of Works having reported that there were a number of causeway beaters (whose wages at present vary from 2s. 9d. to 5s. 2d. per week more than the ordinary labourers) who would require an increase corresponding to that proposed to be given to the latter, the Sub-Committee agreed to recommend that these causeway beaters be, like the ordinary labourers, granted an increase of 1s. per week on their wages during the said period of nine months, but not during the winter months. The Master of Works reported that the settmakers had applied to him for an increase of a halfpenny per hour on their present rate of pay, namely, 7½d., which, if authorised, would bring their rate up to 8d. per hour, which was the rate agreed upon at a recent meeting between the representatives of the Settmakers' Union and a committee of the Quarrymasters' Association. The Sub-Committee agreed to recommend that the settmakers be paid at the rate of 8d. per hour. The Sub-Committee also agreed to recommend that the holidays of the employés of this department, which at present consist of four days per annum, be increased to five days (without deduction of pay), such being the period allowed to the workmen of the water and tramway departments.

Builders' Notes.

The Leeds and County Builders' Exchange, whose members number about 250, have moved to Stanton's Buildings, in Duncan Street, Leeds.

Tenders for the Erection of Malvern Isolation Hospital were received by the Malvern Urban District Council from Mr. Broad, £9,300, and Mr. Holloway, £8,866 14s. The estimate of the Council's surveyor was £7,964 7s. 5d., and it was resolved that the hospital be erected by the Council, and the surveyor was instructed to proceed with the same as soon as possible.

A Nottingham Builder's Failure.—At Nottingham recently the first meeting was held of the creditors of John Oscroft, joiner, builder, and contractor. Debtor's statement of affairs showed liabilities £8,563 16s., and assets £1,651 10s. 5d., leaving a deficiency of £1,323 4s. 8d. After considerable discussion, a committee of inspection was appointed, and to them was left the question of the debtor's contract for the erection of Kirkby-in-Ashfield Board Schools.

Halifax Electricity Works.—Tenders for the extension of the electricity works at Halifax have been let as follow:—Masonry; Ben Riley, Halifax, £2,250; joiner's work, Samuel Greenwood, Halifax, £253 18s.; plumber's and glazier's work, William Ward, Halifax, £195 10s. 6d.; slater's and plasterer's work, Rushworth and Firth, £153; iron and steel work, Lee and Harrison, Leeds, £293; concreting, G. Greenwood and Sons, Halifax, £130; painting, Thomas Kendal, Halifax, £35.

Building Accident at Keighley.—Last week a serious accident occurred at some shops which are being erected on the south side of Cavendish Street, Keighley. The contractor for the masonry is Mr. John Brown, of Staveley Road, Bingley, and his son, Harry Brown, was working on the top of the building—a height of about 30ft. He was standing on the outer wall waiting for a stone to be craned up, and it is supposed that in a moment of absent-mindedness he stepped or slipped off the edge. He fell on to some scaffolding below, then rolled on to some boardings, and finally alighted on the pavement. A passing cab was hailed, and the injured man was conveyed to the District Hospital. One arm is broken, and there are injuries to the head. His condition was reported to be rather serious.

New Development in the Granite Trade.—The building trade in Aberdeen has recently been showing signs of less activity, but it may be some consolation to know that a new development has taken place. Hitherto the stones which have been sent away for building jobs to the south have consisted only of portions of shop fronts, banks, &c., which were mostly confined to the polishing yards. But about five or six years ago Messrs. A. and F. Manuelle executed an order for a villa in Blyth, one of the coming fashionable resorts on the Tyne. This had apparently given so much satifaction that the firm have had in hand for some time a much larger villa for the architect of the first one, the contractors being Messrs. J. and W. Simpson, of Blyth. The whole of the building is practically of granite worked in Aberdeen ready for building, the stones being specified to come from Dancing Cairns quarry, and they have all to be fine axed. Besides the villa itself a very imposing railing base and coping are also of fine axed granite. Mr. Andrew Burnett, builder, Persley, has had a large squad of men preparing a considerable portion of the stones, and Mr. Petrie, builder, Victoria Road, has also had some men at work on the contract. The first portion of the work is being shipped to-day, the remaining portion following in a few weeks.

Surveying and Sanitary Notes.

The Widening of Evesham Street, Redditch, and the consequent borrowing of £3,750 have been sanctioned by the Local Government Board.

To Students of Surveying.—The winter session of the courses of lectures and preparation, conducted under the presidency of Mr. Philip E. Pilditch, at 2, Pall Mall East, S.W., for the various examinations of the Surveyor's Institution, are about to commence, and final arrangements are now being made.

Widening of Old Street, London.—The St. Luke's Vestry have decided to send a strong letter to the London County Council, urging them to proceed with the widening of the western end of Old Street, at the junction of Goswell Road, which had been at a standstill for over eighteen months, with the result that business thereabouts was languishing, and the vestry are losing the rates of the vacant property.

Leamington Sewerage.—A Local Government Board inquiry was held last week by Colonel A. J. Hepper, into an application of the Leamington Corporation for permission to borrow £1,300 for works of sewerage in the borough. The loan is required for laying new sewerage mains to replace old mains which had become dangerous and had occasionally fallen in. It is also proposed to lay a new sewer on the Cubbington Road. There was no opposition to the loan, and the inquiry closed.

New Roads in Halifax.—The Improvement Committee of the Halifax Corporation recommend that in the Bill to be promoted by the Corporation in the next session of Parliament compulsory powers be obtained for the construction of a new road from the top of Salterhebble Hill along Chapel Lane, Bankhouse Lane, to the Salterhebble, Stainland, and Sowerby Bridge Road, between the canal bridge and the railway bridge over the above road; new road, 60ft. in width, from Skircoat Green, through Long Wood, Scarr Wood, Pye Nest estate, to Bolton Brow, Sowerby Bridge; new street from North Bridge Street to Winding Road; and the widening of New Bank from near Garden Street to Godley Bridge.

Pavement Dispute at Colchester.—At Colchester Police Court last Tuesday week, before Messrs. H. G. Egerton Green (in the chair), W. Buck, and A. K. Francis, the Colchester Brewing Company, of East Hill, Arthur Grimwood, trading as "Grimwood and Sons," builder, of Sudbury, and George Henry Page, architect, of Culver Street, were summoned at the instance of the borough surveyor (Mr. Herbert Goodyear) for displacing the pavement at East Hill without the consent of the Urban District Council. The town clerk (Mr. H. C. Wanklyn) appeared in support of the summons, and Mr. W. Young was for the defence, in the absence of Mr. E. Thomson Smith. The town clerk quoted from the section of the Public Health Act (1875), under which proceedings were brought, and which provided that any person who, without the consent of the Urban Authority, wilfully displaced, took up, or injured the pavements, stones, or materials in any highway repairable by the inhabitants at large, should be liable to a penalty not exceeding £5, and a further penalty of 5s. for every square foot of stones or material displaced. In this case, the borough surveyor, on Aug. 24th, visited a proposed new floor in the course of erection at premises in the occupation of the Colchester Brewing Company, at East Hill, and found that two excavations had been made in front of the building under the pavement, and that for the purposes of this excavation two large pieces of pavement had been removed. The pavement measured in each instance about ten feet in length and four feet in width. The borough surveyor called the attention of the builder's foreman to the encroachment on the footpath, and warned him that the work—which was being executed for the purpose of constructing a pair of cellar-bays—must not proceed. The foreman replied that this portion of the work was not shown on his plan, but that the architect had told him to go on with the work. The borough surveyor subsequently wrote to Mr. Page, calling attention to the matter, and stating that the cellar-bays must not be constructed; but Mr. Page personally replied that he should not stop the work, as he hoped this matter would go through. The plans of the new floor in course of erection were approved by the Sanitary Committee in May last, but they showed nothing in the way of cellar bays. Mr. Young, for the defence, emphasised the fact that the Brewing Company believed everything was being done legally, and that when they heard there was an irregularity the work was at once stopped. There was no evidence, he submitted, that the company had committed any offence, while, in regard to the other defendants, he pointed out that when a plan showing the cellar-bays was sent to the borough surveyor, it was returned with an intimation that the "block plan" was not shown. Mr. Page assumed that in all other respects the plan was correct, and proceeded with the work. The town clerk intimated that as regards the Brewing Company, the authority would be satisfied with an undertaking that they would reinstate the pavement displaced, and pay the costs of the case as against them. Mr. Young, on behalf of the company, expressed willingness to give an undertaking to the desired effect, and the Bench, on this condition, adjourned the case for a month, in order that the undertaking may be carried out in the meantime. Mr. Page was fined £1 and 14s. 6d. costs, while the case against Mr. Grimwood was dismissed on payment of 10s. 6d. costs.

Public Hall, Hartley Wintney.—The warming and ventilation of this building has been carried out by Messrs. John King, Limited, engineers, of Liverpool, by means of their "small tube" hot-water heating apparatus and special economical coil heater, and their patent tubular exhaust ventilators.

Engineering Notes.

The New Electric Tramways in Sheffield were inaugurated last week. The overhead trolley system was the one adopted. The cost of the conversion of the old system and the construction of the new has been about £315,000.

Dundee Harbour Trustees propose to introduce a Bill in the ensuing session of Parliament for power to borrow £100,000 for new works for the improvement and extension of the harbour and providing facilities for traffic, &c.

The County School, Neath, is being warmed and ventilated by means of Shorland's patent Manchester grates, patent exhaust roof ventilators and special inlet brackets, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Electric Light on the Borders.—The Lighting Committee of St. Boswells have instructed Mr. Purves, Edinburgh, to make application this autumn for a provisional order for electric lighting. Mr. Purves has also suggested a scheme for Kelso, which he states to be admirably suited for the purpose, and the scheme includes the running of an electric tram from the town to the station. Hawick and Galashiels have also schemes under consideration.

Improvements at Wrexham.—The Wrexham Town Council have made application to the Local Government Board for sanction to borrow £20,000 for electric lighting purposes, and they have now decided to further seek for sanction to borrow £2,100 for providing a refuse destructor, and incidental expenses for alteration of buildings and roads, and £1,700 for public baths, all to be constructed on the Willow depôt site, recently purchased by the Corporation.

Worcester Tramways.—The Electricity and Streets Committee of the Worcester City Council recommend the City Council not to consent to the Tramway Company's application for power to construct light railways in the city, but to oppose it, to take over their tramway undertaking when thought best, reconstruct, and work the whole system. The Company complain that this will prevent tramway extension and development of light railways in the city and neighbourhood for some years.

Oldham Tramways.—The Oldham County Borough Council have decided to adopt the overhead trolley system for employment with their municipal tramways. The reasons given for the adoption of this system are as follow:—(1) Cheapness of construction; (2) cheapness of maintenance; (3) simplicity of system and ease in effecting repairs; (4) the rapidity with which the line could be constructed, and the comparatively small interference with the surface of the streets and traffic. Mr. Newington is the electrical engineer. The scheme is expected to cost somewhere about £250,000.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—		
Sept. 15	Enfield—Block of Schools	School Board	G. E. T. Laurence, 181, Queen Victoria-street, E.C.
„ 15	Thornbury, Glos.—Infirmary at Workhouse	Guardians	G. H. Oakley, Edinburgh-chambers, Baldwin-street, Bristol.
„ 15	Walthamstow—Materials for Electric Light Station	Urban District Council	E. J. Gowen, Clerk, Town Hall, Walthamstow.
„ 16	Brentwood, Essex—Asylum Buildings	Essex Lunatic Asylum	Widnell and Trollope, 20, Tothill-street, Westminster, S.W.
„ 16	Rotherham—Infants' School	Urban District School Board	J. E. Knight, 33, College-street, Rotherham.
„ 18	Gwennap, Cornwall—Addition to Schools	School Board	S. Hill, Architect, Redruth.
„ 18	Pontypool—Repairs, &c., at Master's House	School Board	H. Bythway, Clerk, Pontypool.
„ 18	Preston—Public Abattors	Corporation	Borough Surveyor, Town Hall, Preston.
„ 18	Skipton—Enlargement of Bank	....	J. Varley and Son, Architects, Skipton.
„ 18	Craigellachie, N.B.—Two Blocks of Houses	....	Reid and Wittet, Architects, Elgin.
„ 18	Bradford—Enlarging School	School Board	E. P. Peterson, 48, Sunbridge-road, Bradford.
„ 18	Wimbledon—Ten Workmen's Dwellings	Urban District Council	C. H. Cooper, Engineer to Council, Broadway, Wimbledon.
„ 18	Blackburn—Erection of Turret Clock	Parks Committee	W. Stubbs, Borough Engineer, Blackburn.
„ 19	Littlestones, Kent—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Sept. 19	Didsbury—Police Station	Standing Joint Committee	H. Littler, Architect to Committee, County Offices, Preston
,, 19	Leeds—Wood Floor	....	City Engineer, Municipal Buildings, Leeds.
,, 20	Manchester—Alterations at Baths	Baths Committee	City Surveyor, Town Hall, Manchester.
,, 20	Silloth, Cumberland—House and Shop	D. Over...	G. Armstrong, 24, Bank-street, Carlisle.
,, 20	Leytonstone, Essex—Fire Appliances at Workhouse	West Ham Union Guardians	— Dunford, 100c, Queen Victoria-street, E.C.
,, 20	Long Melford, Suffolk—Strong Room	Fisher and Steed	Fisher and Steed, Solicitors, Long Melford.
,, 23	Pontypridd—Workhouse and Boundary Walls	Guardians	E. C. Spickett, Clerk, Workhouse, Pontypridd.
,, 25	Clones, Ireland—Schools	....	T. Elliott, 37, Darling-street, Enniskillen.
,, 25	Cerne Abbas, Dorset—Building Works at Workhouse...	Union Guardians	A. E. A. Cole, Union Offices, Cerne Abbas, Dorset.
,, 26	South Shields—School	School Board...	F. Rennoldson, 37, King-street, South Shields.
,, 26	Walthamstow—Out Office at Schools	School Board...	W. A. Longmore, Bridge-chambers, Hoe-st., Walthamstow.
,, 27	London, W.—Alterations at Woodfield House	Paddington Guardians	F. J. Smith, Parliament-mansions, Victoria-street, S.W.
,, 28	Staines—Infants' School	School Board...	Murray and Dibdin, 5, Hurstbourne-road, Forest Hill, S.E.
,, 28	Salford—Tiling Floors, &c., in Town Hall...	Town Hall's Committee	Borough Engineer, Town Hall, Salford.
,, 29	Hereford—Renovating Cottage	Standing Joint Committee	A. Dryland, County Surveyor, Hereford.
,, 29	Margate—Coastguard Buildings	Admiralty	Director of Works Department, 21, Northumberland-av., W.C.
,, 30	Hallwill, Devon—Cottage Hospital	....	C. F. A. Voysey, 6, Carlton Hill, N.W.
Oct. 2	Handsworth, Staffs.—Stabling, Workshops, &c....	Urban District Council	E. Kenworthy, Engineer, Council House, Handsworth.
,, 3	Lewes—Alteration and Extension of County Hall	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,, 3	Watford—Offices and Warehouse	Benskin's Brewery, Limited	C. P. Ayres, 14A, High-street, Watford.
,, 3	London, S.E.—Underground Urinal	County Council	Architect's Department, 13, Spring-gardens, S.W.
,, 11	Tooting, S.W.—Asylum	Metropolitan Asylums Board	A. and C. Harston, 15, Leadenhall-street, E.C.
,, 12	Wolverhampton—Workhouse Infirmary	Union Guardians	A. Marshall, Architect, King-street, Nottingham.
No date.	Tunbridge Wells—Parish Room and Institute	....	H. H. and E. Cronk, Architects, Mount Ephraim-road, Tunbridge Wells.
	ENGINEERING—		
Sept. 16	Stockingford, Nuneaton—Pipelaying	....	J. S. Bickering, Waterworks' Engineer, Nuneaton.
,, 16	Warrington—Trial Boring and Test Pumping	Corporation	J. Deas, Engineer, Bank House, Warrington.
,, 18	Carlisle—Electric Lighting	Corporation	A. B. W. Kennedy, 17, Victoria-street, Westminster, S.W.
,, 18	Maldon, Essex—Waterworks...	Rural District Council	H. G. Keywood, Engineer, 6, Market Hill, Maldon.
,, 18	Fareham, Hants—Air-tubes and Pump Ventilators	County Asylum	W. J. Taylor, County Surveyor, The Castle, Winchester.
,, 18	London, N.—Bridge Works	Hornsey Urban District Council	E. J. Lovegrove, Engineer, Southwood-lane, Highgate, N.
,, 19	Witney—Waterworks	Urban District Council	N. Lailey, 16, Great George street, Westminster.
,, 20	Tunbridge Wells—Filter Beds, &c.	Corporation	Borough Surveyor, Town Hall, Tunbridge Wells.
,, 20	West Kilbride, Scotland—Reservoir, &c.	Water Supply District Committee	Warren and Stuart, 115, Wellington-street, Glasgow.
,, 20	Middleton, Lancs.—Electric Lighting	Corporation	Town Clerk, Middleton.
,, 20	Bradford—Retorts, Firebricks, &c.	Corporation	Gas Office, Town Hall, Bradford.
,, 20	Bangour, Scotland—Railway	Edinburgh and District Lunacy Board	J. and A. Leslie and Reid, 72A, George-street, Edinburgh.
,, 20	London, S.W.—Iron and Steel Work	St. Mary's Vestry, Battersea	W. M. Wilkinson, Municipal-buildings, Lavender Hill, S.W.
,, 20	Heckmondwike—Electric Light Plant	Urban District Council	W. C. C. Hawtayne, 9, Queen-street-place, London, E.C.
,, 21	Southampton—Tramways	Corporation	Borough Engineer, Municipal Offices, Southampton.
,, 21	Hull—Electric Lighting	Sculcoates Union Guardians	T. B. Atkinson, 11, Trinity House-lane, Hull.
,, 22	Luton—Electric Lighting Plant	Town Council...	A. T. Snell, Engineer, Suffolk House, Cannon-street, E.C.
,, 23	Leeds—Retort Installation of Twelve Beds	Gas Committee	R. H. Townsley, General Manager, Municipal-bldgs., Leeds.
,, 25	Guildford—Reconstructing Bridge	Rural District Council	N. Lailey, 16, Great George-street, Westminster.
,, 25	Ilfracombe—Plant	Urban District Council	W. H. Frentham, 39, Victoria-street, Westminster, S.W.
,, 27	London, E.C.—Hauling Engines, &c.	Tredegar Iron and Coal Co., Limited	Office, 7, Fenchurch-avenue, London, E.C.
,, 30	Handsworth, Staffs—Gas Engines and Pumps	Urban District Council	E. Kenworthy, Engineer, Council House, Handsworth.
,, 30	Winwick, near Warrington—Electric Lighting	Asylum Committee of Visitors	J. P. Muspratt, Clerk, County Offices, Preston.
Oct. 6	West Bridgford, Notts—Septic Tank	Urban District Council	W. Pare, George-road, West Bridgford.
,, 10	Londonderry—Waterworks	Council	J. J. S. Barnhill, 1A, Strand, Londonderry.
,, 14	Tiflis—Tramways Concession	Town Council...	Managing Department of Council, Tiflis, Transcaucasus.
,, 24	Barking, Essex—Light Railway Plant	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
Nov. 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
Jan. 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
	IRON AND STEEL—		
Sept. 18	Lancaster—Pipes	Water Committee	J. Cook, Water Engineer, Town Hall, Lancaster.
,, 18	Middlesbrough—Steel Roofing	Gas Committee	D. Terrace, Manager, Gasworks, Middlesbrough.
,, 21	Keighley—Iron and Steel Work for Bridge	Corporation	W. H. Hopkinson, Borough Engineer, Keighley.
,, 21	Killarney—Iron Bedsteads, &c.	District Lunatic Asylum	M. J. Mahoney, Clerk of Asylum, Killarney.
,, 22	London, E.C.—Railway Stores	Burma Railways Company, Limited	Offices, 76, Gresham House, Old Broad-street, E.C.
,, 25	Denbigh—Locks	North Wales Asylum	W. Barker, Clerk to Visiting Committee, Asylum, Denbigh.
,, 30	Warrington—Pipes, &c.	Corporation	J. Deas, Engineer, Bank House, Warrington.
Oct. 2	London, N.—Fencing	Edmonton Urban District Council	G. E. Eachus, Engineer, Town Hall, Lower Edmonton, N.
	PAINTING—		
Sept. 16	Walsall—Painting at Cemeteries	Corporation	Borough Surveyor, Bridge-street, Walsall.
,, 18	Preston—Painting, &c., Covered Market	....	Borough Surveyor, Town Hall, Preston.
No date.	Kilburn—Painting, &c., Theatre Royal	....	J. P. Briggs, Effingham House, Arundel-st., Strand, W.C.
	ROADS AND CARTAGE—		
Sept. 15	Shardlow, Derbyshire—Street Works	Rural District Council	T. A. Fuller, Surveyor, The College, All Saints', Derby.
,, 16	Earlestown, Lancs.—Road Materials	Newton-in-Makerfield U.D.C.	W. W. Shirley, Clerk, Town Hall, Earlestown.
,, 16	Wakefield—Street Works	....	City Surveyor, Town Hall, Wakefield.
,, 16	Barnet—Repaving Streets	Urban District Council	W. H. Mansbridge, 40, High-street, Barnet.
,, 16	Epsom—Guernsey Granite	Urban District Council	E. R. Capon, Surveyor, Bromley Hurst, Church-st., Epsom.
,, 18	York—Street Works	Corporation	A. Creer, City Engineer, Guildhall, York.
,, 18	London, N.—Road Materials...	Edmonton Urban District Council	G. E. Eachus, Engineer, Town Hall, Lower Edmonton, N.
,, 18	Old Hill, Staffs—Street Works	Rowley Regis Urban District Council...	D. Wright, Clerk, Council Offices, Lawrence-lane, Old Hill.
,, 21	Hoyland, near Barnsley—Steel Works	Urban District Council	W. Farrington, Surveyor, Town Hall, Hoyland.
,, 22	Hull—Timber	Corporation	A. E. White, City Engineer, Town Hall, Hull.
,, 23	Surbiton—Road and Sewer Works	Urban District Council	S. Mather, Surveyor to Council, Surbiton.
,, 26	Erdington, Birmingham—Stone	Urban District Council	H. H. Humphries, District Surveyor, Public Hall, Erdington.
,, 27	Hellingly, Sussex—Hire of Steam Road Rollers	Hailsham Rural District Council	J. Huxley, Surveyor, Minster House, Hailsham.
,, 30	Wimborne, Dorset—Steam Rolling	....	W. J. Fletcher, County Surveyor's Office, Wimborne.
Oct. 2	Handsworth—Excavation, &c., for Widening Road	Urban District Council	E. Kenworthy, Surveyor, Council House, Handsworth.
,, 2	Windsor—Widening, &c., Road	Rural District Council	W. Menzies, Surveyor to Council, Englefield Green, Surrey.
,, 2	Handsworth, Staffs.—Stone	Urban District Council	E. Kenworthy, Surveyor, Council House, Handsworth.
	SANITARY—		
Sept. 18	Blackburn—Reconstructing Privies, &c.	....	W. Stubbs, Borough Engineer, Municipal Offices, Blackburn.
,, 18	Pontypool—Sanitary Work, &c.	Trevethin School Board	H. Blythway, School Board Offices, Pontypool.
,, 18	London, W.—Barging away Dust, &c.	St. Mary Abbott's Vestry, Kensington..	W. Weaver, Surveyor to Vestry, Town Hall.
,, 18	Hornsey—Sewers, &c.	Urban District Council	E. J. Lovegrove, Engineer, Southwood-lane, Highgate, N.
,, 21	West Bridgford, Notts—Emptying Ashpits, &c.	Urban District Council	W. Pare, Surveyor, George-road, West Bridgford.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Sept. 15	Workington—Town Hall	£40, £20, £10	W. L. Eaglesfield, Surveyor, Town Hall, Workington.
,, 15	Dumfries—Public Library	....	J. Grierson, Town Clerk, Dumfries.
,, 16	Norwich—Bank	£52 10s., £21, £10 10s.	Secretary, Norfolk and Norwich Savings Bank, C.E.Y.M.S. Rooms, Norwich.
,, 28	Hay, Brecknock—Sewerage and Water Supply	£25	C. Griffiths, Clerk to Rural District Council, Hay.
,, 30	Tunbridge Wells—Designs in Tunbridge Ware	£3 3s., £2 2s., £1 1s.	Technical Education Committee.
Oct. 17	Blackpool—School for 1000 Children	....	T. Loftos, Clerk to School Board, Town Hall, Blackpool.
Nov. 30	Island of New Providence, Bahamas, West Indies—Public Market	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *viâ* New York.

Property and Land Sales.

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Particulars, plans, and conditions of letting may be had, when ready, either of the City Comptroller, or the City Surveyor, Guildhall, E.C.; at the Mart, Tokenhouse-yard; and of the AUCTIONEERS, 43, Bishopsgate-street Without, E.C.

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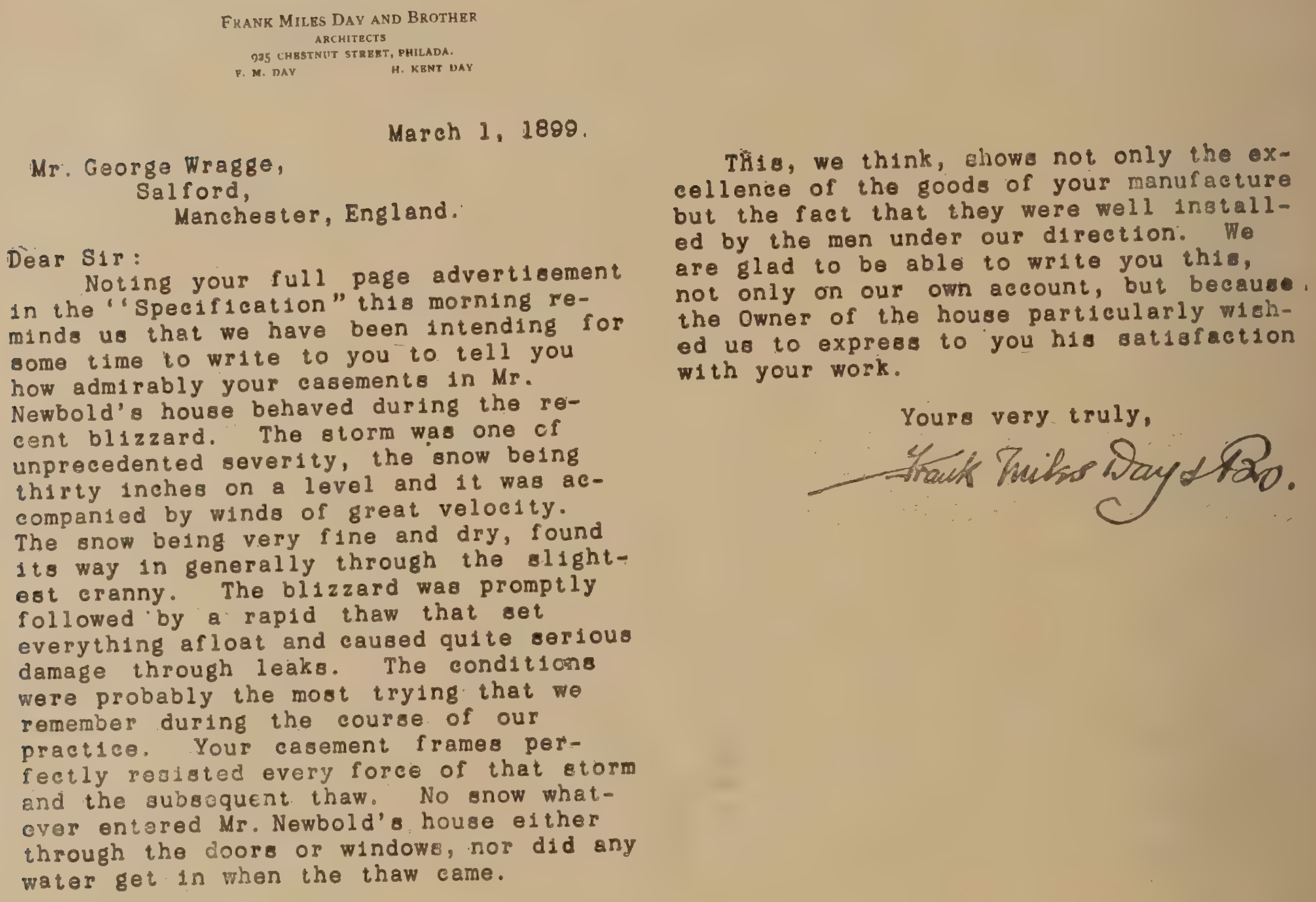

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March 1, 1899.

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This, we think, shows not only the excellence of the goods of your manufacture but the fact that they were well installed by the men under our direction. We are glad to be able to write you this, not only on our own account, but because the Owner of the house particularly wished us to express to you his satisfaction with your work.

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N.B. "THE CRAFTS," adjoining the present works, I have recently taken for the purpose of producing various artistic work but principally for STAINED GLASS AND LEADED WORK, under the management of Mr. JNO. E. C. CARR.

March 15th, 1899.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS.

September 20, 1899.
No. CCXLI
Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

Style in Public Buildings. We never speak now of the "battle of the styles;" it is over, or at least the issue for which our elders spent their eloquence and their temper so generously, has changed. We are free to do what we like; Gothic or Classic, Greek or Barbarian, we may choose as we think fit, and no one can nip us with the criticism that our works are in a style inelegant or uncivilised. But the question which style we shall follow has given rise to a far more important one—that is to say, whether we are to follow any recognised style at all. "Why should we not form our own style," say the advanced party. "Our study of the works of earlier times has led us to the belief that in all good work the principle has been the same; honest subservience to constructional necessities, and for beautification a rightly measured imitation of the forms which nature has placed around us for our enjoyment; let us accept the principles suggested by the ancients and our own common sense, and work them out for ourselves to their natural result."

Well, these were inspiriting prophets; had mankind been complacently handling dry bones for the last three centuries, and were we the blessed generation that should inaugurate an era of fresh and vigorous life? Anyhow, we set about our work with eagerness; cottages were built, furniture was designed where constructive needs were alone responsible for the resulting appearance, and the ornamentation (if any) was carried out with strict regard to the imitation of natural forms. It is true such an ideal has been more talked of than realised; when you come to design anything, how difficult is it to prevent here an entablature and there a column—traces of that slough from which we have lately emerged—from creeping in; still, with small works there has been and still is an honest and more or less successful endeavour to work on the principles from which we hoped so much.

But success in small works is not enough; there is urgent need for an architecture like the Gothic, that is elastic enough to cover all wants; every day, large buildings have to be grappled with; every year there are more town halls, public baths, public libraries, and the rest, which have to be designed somehow. Here you would think is an opportunity for the new style—if such a thing exists—to justify itself in the eyes of a conservative and sceptical public. Yet for some reason or another the opportunity is not taken; on the contrary, in large works we fall back more and more upon the old styles; indeed, we have almost lost again the prerogative of freedom won with so much sweat twenty years ago; anybody who proposed to build a town hall or a court of law in the Gothic style, or indeed any style but the Renaissance would be regarded as a madman. The orders have returned to us in full force, and the shade of Sir Christopher Wren sits like lead upon our spirits. Nay, the very vanguard of the forward movement, the Glasgow designers, when they have some monumental work in hand, out-Herod Herod in the heaviness, the classicality, the Johnsonian character of their work. In the sculpture, the painting, the trimmings of their designs there are indeed many traits which shout negation to the idea that they belong to any century but the nineteenth; yet the structure of their decoration, the architecture pure and simple, is hopelessly, aggressively Palladian. Take Mr. Belcher again, in whose smaller work there is so considerable an effort to develop a style in accordance with the requirements of the present day; when he comes to a work like the Colchester Town Hall, away fly all such notions; the orders, with their capitals, bases, entablatures, pediments, and all the old properties of the Wren-Vanbrugh management, are brought out from the oblivion where they have lain—lain so long indeed that we cannot resist a sensation of pleasure at seeing our old friends once more resuscitated.

AT THE BACK OF THE HOTEL KÖNIGSTUHL, RHENS. DRAWN BY W. H. ANSELL. (*See p.* 97.)

Anyone who has tried his hand at one of the large competitions will, I am sure, feel with me how hard it is to do without the assistance of the orders in designing a large building; how nimbly cornices run along the elevations, and how quickly little circles scatter themselves about the plans. Why should this be so? We do not feel the same temptation when we are trying to design a house; it is only in a large work, where dignity and solemnity are required, that we instinctively feel for the orders. Cannot our modern style achieve dignity? Gothic could be dignified in large buildings as well as charming in small ones. Why cannot we do the same according to our lights? It seemed once as though the object might be achieved by a process similar to that of nature. A creature transplanted into a new set of circumstances gradually loses the use of those organs which have become valueless by the change, and develops others which have become necessary; so might we, one would think, starting with the Palladian style, its dignity, refinement, and practicability, have gradually cut out such features as were useless to us, and have been left with an architecture which would have been our own, at least, in so far that we copied nothing for the sake of copying it, but because we felt its use. This is the sense in which our house architecture is original. The ancients had windows and doors, and so have we, but we are not plagiarists on that account; and we are original, inasmuch as we have seen the uselessness—to us, at least—of many things which they considered essential.

But in our public and municipal architecture the very reverse process seems to be going on; unessential features and forms are introduced for their own sake, and our chief object seems to be to throw ourselves back to the very time when that rational conception of architecture, which our study of Gothic has taught us, was at its feeblest. Why should it be so? Is it that we are puny folk, and that any ideal of ours lacks breadth and size to embrace a large work? Can we only be artistic in a small scale and to express humble emotions? And for dignity must we always be compelled to borrow wholesale from the past? Architecture on a large scale then will never be anything but an allusive kind of art, touching us only by recalling to our minds certain bygone periods of the world's history, which we suppose to have been in some way better than our own. In that case we may as well build to recall the age of Dr. Johnson as any other if our tastes lie that way. But we must cease to hope for a true modern style; that can never be a true style which can only express our home-keeping emotions, and refuses to be with us when we come out to play our parts before men. E. B. S. S.

Beauty and Utility. IN despair of finding a satisfactory explanation of the quality which we express by the word "beauty," it is often said that it consists in the perfect adaptability to its ends of any object or organism, and the writer has even heard it maintained that a locomotive engine was a beautiful object on this ground. Now there is, no doubt, a certain beauty in fitness which is possessed by such things, and which becomes evident when the object under consideration may lack those æsthetic qualities which would otherwise compel admiration. There is, further, the beauty of excellent workmanship, which machinery must have, or the embanking walls of a reservoir, let us say, if they are to be capable of performing their work with safety to the public, and to those whose business it is to tend them; but it is obvious that such use of the word "beauty" is only possible in a very restricted sense, the qualities usually included in an adequate definition of it being many and various. Such different things as musical sounds, mathematical propositions, scientific building and engineering construction, poetical ideas, gradations and oppositions of colour, expressive drawing and delicate silhouette, to name only a few, without by any means exhausting the catalogue, may have the term applied to them with some degree of fitness, and it may be the loose way in which the word "beautiful" is used which is to blame for the confusion of thought. Strictly speaking, it refers purely to emotions aroused by æsthetic qualities, and it is inaccurate to make use of such phrases as "a beautifully built wall," when, what is really meant, is that the construction is sound, the stones well cut, or the bricks evenly set. This may be excellent building, but does not in itself constitute beauty. If the wall be really beautiful (apart from the lovely accidents imported by the lapse of time) it is so by reason of the just proportioning of voids to solids, by the spacing of the windows and doors, by the reticent jewelry of its carved ornament, and so on, the beauty residing in the design and not in the excellence of workmanship. But as soon as one touches ornament the manner of workmanship becomes of importance, no matter in what material it be carried out, and this importance increases in proportion as the object ornamented approaches the confines of what is called "Fine Art," until the point is reached at which a subject which is ignoble may be dignified by the manner in which it is rendered. To assert, as is sometimes done, that it is only necessary to build simply and fulfil requirements perfectly to gradually evolve a fine architecture, is to confuse mechanism and design. Architectural effect depends upon proportion, spacing, mass, silhouette, projection; not upon mechanical excellence in building or even convenience in planning. The simplest building and attention to average requirements in planning produced the rows of uninteresting brick boxes of the earlier part of the century, and it is as useless to expect that good architecture should spring from pure utility as to seek for roses in the place where cabbage seed has been sown. S. S. G.

On Reflection.

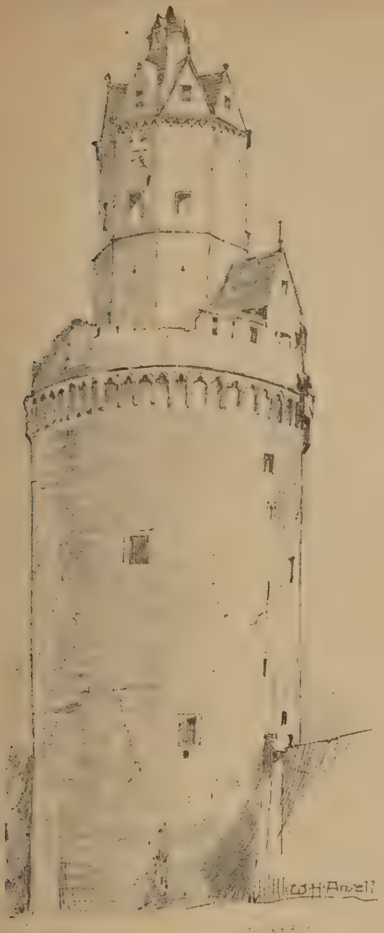
Boycotting the Exhibition. THERE seems to be some danger lest the Englishman's strong sense of justice may impel him to an act of gross injustice. This statement, parodoxical as it seems, is strictly true. All Englishmen, without distinction of creed or party, have been filled with indignation at the outrageously cruel and unjust act of five French officers at Rennes. Therefore it is proposed that we should show our indignation by boycotting the Paris Exhibition of 1900; some, indeed, would go further and break off all commercial relations with a nation which can perpetrate so foul a wrong, and apparently would have us treat every Frenchman as "a heathen man and a publican." Not a few of the generous souled and impulsive—but illogical—amongst us have actually begun to put the boycott into practice. We read of firms which had booked positions for the Exhibition withdrawing their names, of individuals refusing to purchase French wares, of a Town Council declining to accept a French tender (although the lowest), and of an employer discharging those of his workmen who happened to be Frenchmen. This last incident, it is true, occurred in America, but it may be quoted as an example of a spirit which seems to prevail somewhat widely in this country. A little reflection would surely show that such manifestations are both futile and unjust. Admitting, for the sake of argument (a large admission), that we are justified in seeking to punish for their wrongdoings the citizens of a friendly foreign state, it must be obvious that our punishment has the fatal defect of falling most heavily upon those who deserve it least. It is not the military, but the commercial classes who would suffer most from the effects of an extensive boycotting of French commodities (if such a thing can be conceived of as possible), and it is absolutely certain that amongst those who would feel it most keenly would be many who have been and are entirely out of sympathy with the evil doings of the military clique. There is wisdom as well as humour in the advice of the "Daily Chronicle's" cockney poet:

> In the cause o' the right punch as 'awd as yer like,
> But be sure yer don't punch the wrong 'ead.

But, of course, the whole thing is utterly futile. The commercial interests of the two nations are too closely intertwined to be seriously affected by this outburst of feeling. There is reason to hope that by the time these lines are printed the French Government will have repaired—in some degree—the wrong that has been done. But, however that may be, it is absolutely certain that no amount of boycotting can afford one iota of help to Captain Dreyfus and his family. Moreover, such proceedings are very like what might be described in homely language as cutting off one's nose to spite one's face. We maintain commercial relations with France, because it pays us to do so; to break off such relations would be to injure ourselves as much as our neighbours.

A Clacton=on=Sea Competition. ONCE more we have to call attention to an architectural competition promoted by a local council, the members of which seem to have a very inadequate sense of what is due to the competing architects whose time and talents are placed at their disposal. The competition in question was for the laying out of about 900ft. frontage of cliff, and the erection of a pavilion, with covered promenade, reading and refreshment rooms, &c. In the conditions the Clacton Urban District Council state that they will be guided in their award by a F.R.I.B.A. The designs were sent in by July 24th. Instead of the assessor having been appointed before the date named, it was some time after the delivery of the drawings that the Council applied to the President of the R.I.B.A. to give them the names of suitable Fellows from amongst whom they might choose an assessor. The President declined to name more than one, and added that the fee would probably be about 100 guineas. As there are only seven designs, the Council thought this excessive, and it was suggested that each councillor should make inquiries with a view to the nomination of a suitable referee. Two names were proposed, viz., Mr. F. J. Eedle, of 8, Railway Approach, London Bridge, and Mr. A. Sykes, A.R.I.B.A., neither of whom are qualified, not being Fellows of the R.I.B A., as required by the Council's conditions. Mr. Eedle has been appointed by the Council. It is to be hoped that this false step will not be persisted in. The unsuccessful competitors could very probably object to Mr. Eedle's award. In these competitions a recognised authority, beyond suspicion in every way, should be appointed, and the conditions strictly adhered to. We hope to publish a note on the designs when they are publicly exhibited.

Architects' Advertisements. THE professional man of the present day does not seem to regard the advertising of his ability in the same light as was customary in former years. The architects of the past generations stood aloof from all advertising, whether direct or indirect, considering that such would be beneath them as professional men. This, however, is not the case with many architects of the present day. It is true that in this country they do not openly advertise, but only do so in an indirect manner. But our brothers across the Atlantic have got ahead of us in this respect, if one may judge by their advertisements in the American magazines. One we came across lately may be quoted as an example. "DON'T BUILD AN OLD HOUSE," it begins. Having given—in very large type—this piece of grotesquely superfluous advice, the authors proceed to remark that "on receipt of 50c., in 1c. or 2c. stamps, we will send post-paid a copy of 'S—'s Modern Houses, No. 57 just out, and guarantee to forfeit 1,000dols. in cash if you find therein a design ever before published by us." After giving details and prices of their portfolios of designs, the advertisers point out that they will return your money if the wares are not satisfactory, attend to business with promptness and despatch, and generally conduct themselves after the approved manner of the diligent tradesman. These advertising architects invariably publish a book of designs to prove to the public the greatness of their genius. These books evidently have a large sale, for one advertiser (an Architectural Co.) says: "From our plans shown in 'Modern Homes' 154 buildings were erected in 1897, and we received orders in the month of March for building designs covering a cost of 105,000dols." The advertisement is usually accompanied by a perspective sketch of one of the author's buildings, and occasionally by plans, which, to the English mind at any rate, possess little of the comfort the architect always claims for them. For instance, there is an inexpensive cosy home advertised by a Grand Rapids architect. From the plan it would appear rather awkward if there were many callers at this house during dinner time, seeing that it would be necessary for the servant to go through the dining-room to answer the door. 1,600 dollars builds this house complete. It is to be hoped that the Americans will long be ahead of us in regard to advertisements, for one could hardly consider such worthy of a professional man or an artist.



WATCH TOWER, ANDERNACH-ON-RHINE.
DRAWN BY W. H. ANSELL.

SOME RHENISH VILLAGES.

By W. H. ANSELL.

THERE is an idea current amongst many people that the beauty of the Rhine has departed, that, although the tourist and the mere honeymooner may find it all-sufficient, to a critical artistic eye it is sadly deficient.

The Rhine, however, has much character which cannot be discerned from the deck of a steamer under a midday sun. It is necessary to lose one's self in the little villages which line the stream under the shadows of the vine-clad hills, to wander in the early morning along the banks, with the land taking new shapes under the rising mists; or in the evening when the tired oxen are brought down to bathe and drink, after a hot day's work in the fields, when the boats swinging out into the stream stand black and strong in the yellow light, then it is that the heart of the painter, and even of the architect, rejoices.

Cologne, where I first saw the Rhine, is somewhat disappointing: a busy, apparently prosperous city, with very little of the picturesque remaining in its streets, while the traditional smells which have made its name famous seem to have entirely disappeared. The Dom and the many Romanesque churches redeem the place from monotony and deserve careful study. The latter are strongly reminiscent of Lombardic work, with the round apsidal ends to choirs and transepts, and open arcaded galleries giving a deeper note of shadow and mystery under the broad eaves.

On going up the river it is perhaps better to take train as far as Bonn, and commence the journey by boat from there. The first place worth staying at is Andernach.

Here there is a beautiful transitional Romanesque church, with four towers. The font is a delightful piece of work of the thirteenth century. Andernach is an ancient town, having been of some importance in the time of the Roman occupation; it has suffered a great deal by the different wars which have been waged in the district, but still possesses features of architectural interest, conspicuous among which is the fifteenth century watch tower.

Across the river is Leutesdorf, a quaint little village, where apricots are plentiful.

The ferry boat, by which one crosses the stream, is fastened by a long chain to a buoy moored centrally, and swings from side to side of the river like the pendulum of a clock. The strong current supplies the motive power, according to the inclination given to the boat by steering.

From Andernach to Coblentz is not a far cry, and from thence the journey may be continued to Rhens either by train or by a local service of small steamers. The larger boats do not stop at this, one of the most charming places on the river. In Coblentz the prevailing note is militarism. Every second man is a soldier; forage wagons and all the varied impedimenta of barrack life continually pass along the streets; the fortress of Ehrenbreitstein across the river dominates the place, and the arts of war are in constant evidence.

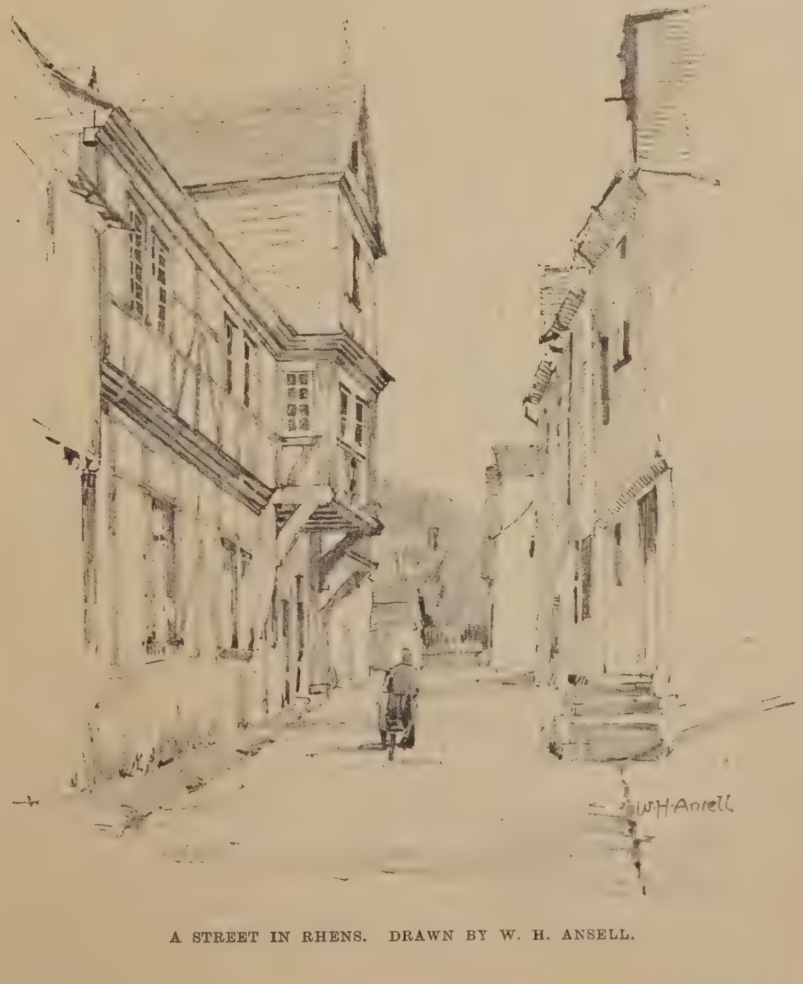
In Rhens, on the contrary, though only five or six miles away, all is peace. It is 1899 in Coblentz; it might not be more than 1699 in Rhens. The little town still retains its protecting walls dotted at intervals by round watch towers. The roads, whether down to the river or out among the orchards, still pass under the arched gate houses, from the machicolations of which the good people of Rhens doubtless gave warm receptions to impudent invaders in days gone by. The husbandman yokes his bullocks to the quaint wagons in exactly the same way as his grandfather did, and the slow-moving animals, as with quiet clatter they pull the sweet-smelling hay up the steep cobbled streets, are exact reproductions of their ancestors that did the same work in the same streets two hundred years ago. The houses in Rhens are mostly of the fifteenth, sixteenth, and seventeenth centuries, placed irregularly, and without regard to the lines of the streets. They are solidly built of timber, with stone filling between the woodwork, which, having been left from the tool without paint, has in consequence acquired a beautiful silvery tint.

One notices the overhanging stories with brackets and curiously carved corbels, the long sagging moulded beams, capped with brilliant splashes of colour where the window flowers grow, and the high pitched roofs dotted with many little pointed dormers. The timbers in many cases are numbered consecutively in Roman figures, commencing from the angle posts. This was evidently done by the carpenters who prepared the pieces, to ensure their being fixed in the right positions.

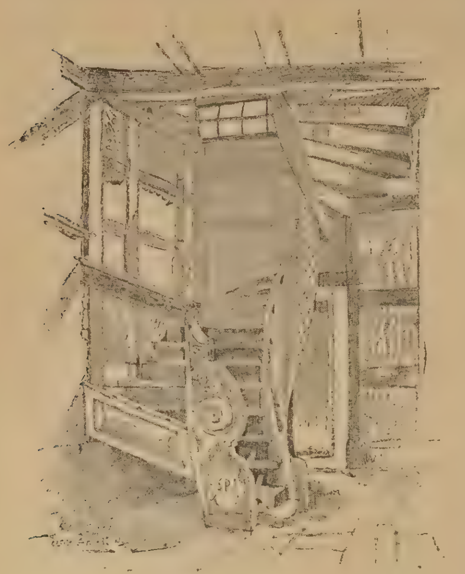
The interiors of the houses are most interesting. I sketched the staircase in one fine old place, where the central newel, with the handrail curving round it, is formed out of the trunk of a tree, the broad bole being left at the bottom to form a base. In this house the wooden construction of the walls showed on the inside, only the part between the timbers being plastered. The Hotel Königstuhl, by the river, is a quaint country inn, built about 1620. My quarters were connected to the main building by a railed-in balcony on the old town wall, over which the inn has been built. Across a little hall one entered a long, low corridor or gallery open on one side to the garden, with shady eaves and timbers gone silvery grey and green with age. The yard below was a delicious harmony of cool, quiet colour, whilst through a dark archway one looked into the brilliant sunlit garden beyond.

Near Rhens are several villages having the same character, full of charming delicate colour. On the same side of the river are Brey, Spay, and the rather larger town of Boppard, with its typical Romanesque church. On the other side are Braubach, Filsen, and Osterspai, all full of paintable subjects, bits of quaint courtyards, peeps of the river down narrow streets, and much interesting architectural detail.

The ordinary household pots are a source of constant pleasure. Of curious shapes, with good colour and glaze, they have all the little variations which show the handiwork of a man, as distinct from the machine-like uniformity



A STREET IN RHENS. DRAWN BY W. H. ANSELL.



STAIRCASE IN HOUSE AT RHENS: DATED 1611. DRAWN BY W. H. ANSELL.

of so much of our pottery. They would grace a studio or a kitchen, and it is matter for regret that in England such pots are oftener found in the studios than in the kitchens.

The peasantry are quiet, hard-working folk, and, when working in and among their homes, one feels keenly the inability to communicate freely with them. What old world legends, what folklore, what interesting local history one might hear from these people if one only knew the language more perfectly? Stevenson in one of his essays says:—"It is not those who carry the flags, but they who look out of the upper windows who have the fun of the procession." There are, however, some windows too high to serve any useful purpose to the sightseers, and being in a country with only a smattering of the language is looking out of a very high window indeed.

GLASOGRAPHY.

THIS is the name applied to a new patent process for producing on glass, by mechanical means, any design in transparent colours. Although colours could formerly be applied to glass they did not, until this process was introduced, attain sufficient transparency to make a perfect substitute for stained glass. The process can also be applied to the manufacture of tiles for decorative purposes, and also to the production of artistic advertisement plates in glass. An exhibition of the different uses to which the materials can be put was given last week under the auspices of the Economic Commercial Association of 29, New Bridge Street. Some examples of substitutes for stained glass were shown, which although they had been exposed to the light for some months, and in one case steeped in boiling water, still retained their brilliant appearance. The process—which, by the way, is patented in all the leading countries of the world—consists in affixing a lithographic or photographic transparency in any variety of colour to the back of a sheet of glass, which, after being varnished, is coated with a specially prepared wear-resisting composition, very much resembling enamel. The effect of the finished article, although accomplished in such an easy and simple manner, is, nevertheless, very striking. The inventor claims that the work can be produced at a very great reduction on the ordinary ruling prices, so that its cheapness will bring it within the reach of everyone. For decorative purposes in public or domestic buildings, and for the enrichment of artistic details, the glass tiles with coloured designs possess considerable possibilities. A company will shortly be formed for the purpose of working and developing the process.

CONSTRUCTION OF SANATORIA FOR CONSUMPTIVES.*

BY F. R. WALTERS, M.D., M.R.C.P.
Physician to the North London Consumption Hospital.

THE characteristics of a sanatorium for consumptives are best determined by a consideration of the objects and methods of treatment for which it is intended.

The *objects* are to treat consumptives, who are not moribund, by hygienic and other methods, so as to restore them to health. Medicinal treatment may (and should) be included, but hygienic means are of first importance. These hygienic means consist mainly in a regulated and abundant diet, extremely free ventilation with the purest air, as far as possible an outdoor life, and the regulation of rest and exercise, and of all other details known to influence the course of the disease on the well-being of the patient.

Locality.—It has been argued, but on insufficient grounds, that the place and the building where such treatment is carried out are of no importance. But although many different places are more or less suitable, to obtain the best results we must carefully choose the climate and locality for each individual patient. And although ordinary houses may sometimes be adapted to the purpose, they are usually far from convenient, and sometimes quite unsuitable.

An ordinary House is usually inconvenient for the following reasons: (1) Thorough ventilation of the patient's room is essential, and this is apt to interfere with the comfort of the other inmates of the house, unless it has been specially planned. Moreover, few ordinary rooms are capable of being continuously flushed in all weathers with fresh air from outside. (2) Ordinary rooms are usually full of dust-traps, projecting ledges, ill-fitting boards, unwashable walls, and the like. (3) It is exceptional to find shelters for the open air treatment in wet weather, or arrangements to exclude rain while they freely admit fresh air; and it is not always possible to find suitable places about the house for open air shelter to which the patient can be wheeled on his bed or couch.

The ordinary Household is even more of a drawback than the ordinary house. Servants cannot be readily trained in new ways of cleaning; the presence of a trained nurse, without special provision made for her, leads to difficulties; and fond relatives are apt to be guided by their ever-present prejudices rather than by the injunctions of the non-resident doctor. Moreover it is difficult to obtain for the patient that perfect rest and quiet and freedom from emotional excitement which are so important in febrile stages of the disease.

Hotels and Boarding-houses.—Similar arguments may be brought forward with even more urgency against the ordinary hotel or lodging-house, where the prevailing motive is apt to be pecuniary, and the individual has to accommodate himself to the wishes of the majority.

Open Health Resorts.—Treatment in open health resorts therefore labours under great disadvantages. Not only are the woods and gardens wanting in some of the requirements for consumptive patients, such as adequate shelter against wind and weather, and freedom from dust, but supervision is difficult and treatment relatively expensive. General practice is incompatible with proper supervision of more than a very small number of such patients, and a small number is not remunerative. Dr. Macgahan, who founded an open villa sanatorium at Aikin in South Carolina, finds a dozen households as much as he can superintend, and loses money over them into the bargain.

Specially arranged Sanatoria, completely equipped, and provided with their own medical, nursing, and administrative staff, are therefore far better than an open health resort, both for doctors and for patients; while they constitute the only means of providing suitable treatment for the poor at a reasonable cost.

Size of the Sanatorium.—A large sanatorium can only be managed with the help of several medical officers. This may lead to divided responsibility and imperfect supervision, unless the subordinate medical officers are of nearly the same quality as the chief medical officer. On the other hand, a small sanatorium is relatively expensive, and may be unnecessarily dull for the patients. Probably

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[*] A Paper read before the Annual Congress of the Sanitary Institute, held at Southampton on August 29th, 30th, and 31st.

GATE-HOUSE, ANDERNACH-ON-RHINE. DRAWN BY W. H. ANSELL.

forty to fifty patients could be managed by one medical officer. Most of the newer sanatoria in Germany for the working classes have about 100 beds, and the Brehmer sanatorium for paying patients now has a total of 335 beds, while the smallest complete sanatorium in Germany has, I believe, 16 beds; but there are few with less than 20 beds.

Component parts of a Sanatorium.—In addition to the shelters in the grounds, a sanatorium consists of Administrative, Commissariat, and Patients' departments.

The Administrative Department includes the offices, perhaps a board room, quarters for the medical officers, nurses and servants, a disinfector, mortuary, and frequently also engine and dynamo house, laundry, stables and farm. The servants should, if possible, have a block to themselves, or quarters over the kitchen block, male servants separated from female, and the housekeeper in some central part where she can control the indoor servants. Nurses must be within call of the patients, but should have a private sitting-room as well as bedrooms, the matron in touch with the other nurses. The chief medical officer's quarters should be within easy distance of the patients' rooms, and be so placed that he can readily supervise them when in the grounds. Where there are several medical officers, one should have his room near the patients. The disinfector may be combined with the laundry and electric supply, the mortuary with the stables, and all these should be some distance from the patients' quarters, as well as, of course, the farm, if there is one.

The Commissariat Department, consisting of dining saloon, kitchen, scullery, store rooms, &c., should be far enough from the patients' quarters to prevent noise and smell from reaching the latter.

The Patients' Quarters are least like the rooms of an ordinary house. They include bedrooms, sitting-rooms, and accessory rooms, such as bathrooms, lavatories, and the like. The chief points to be borne in mind in their construction are as follows:—(1) They should admit as much fresh air and sunlight as possible, and be purged of foul air as completely as possible, approximating in this respect to the open air. (2) They should be as far as possible from ledges and other dust-traps; all angles being rounded, floors free from cracks, walls washable, and ceilings cleansable. Both rooms and furniture should be made with a view to ready cleansing with damp cloths. (3) They should be dry, and their windows should exclude rain and strong wind, while freely admitting light and air. (4) They should be cool in summer, warm in winter. (5) They should admit of patients being readily carried on couch or bed on to a balcony or terrace, or into the grounds. (6) There should be ready means of communicating with the doctor, nurse, and servants. (7) The rooms should be quiet and reasonably private.

Size and Shape.—Cubic content is of far less importance than large inlets and outlets for ventilation kept constantly open. Too small a room, however, may be draughty, although this is less objectionable than a foul atmosphere. Oblong rooms with the narrow end to the front are less expensive than those with a larger frontage; but where expense is no object the latter are preferable. There should be one corner for the bed out of the direct air current, so that door and window may be kept open. There should only be one patient in each room. The only exception to this rule is where patients are without expectoration, cavities, or fever.

A southerly *aspect* is advisable wherever patients are likely to occupy their bedrooms in the daytime. But where they only do so at night, and there is adequate protection outside against wind, the aspect is of less consequence.

Ventilation.—A chimney or corresponding air-shaft should always be present, even where the heating is by pipes. A large ventilating opening should be placed over the door. This should not be covered with a grating. Small valve ventilators are not to be recommended as inlets. Their valves are noisy, the area is so small as to be apt to cause draughts, and their gratings collect the dust. Tobin's tubes are permissible; but all such contrivances are unnecessary so long as the windows are kept open and there is sufficient outlet. Boyle's extractors, or steam-jets may, however, be useful in expelling foul air.

The *windows* should occupy at least half the wall space of one side. If casement windows are used, they should open outwards to right and left and have a transom over them or else an adjustable blind rising from below. The window sill should not be more than 2ft. from the ground, so that a patient lying on a couch can easily see out. If there is a terrace or balcony outside, a height of 6in. or 1ft. is preferable, unless the part below the window is removable. Very large ordinary English or guillotine windows have some advantages, although only half the area is available when the sashes are open to their full extent, and there is less protection against wind. They can readily be fixed in any position; they allow of a double amount of air, and give a greater sense of security at night. With such windows sliding shutters may be used with parallel horizontal sloping laths; with casement windows the shutters must be hinged from above or below. At Ruppertshain a kind is used which can be let down from within the room like a hood, and used either as a sun blind or rain screen. Such shutters are also useful in excluding light in the early morning, as some patients can only sleep in the dark. All window fixings and blinds should be free from noise when the wind blows. Ordinary roller blinds or Venetian blinds are apt to be noisy at times with wide open windows.

THE CHURCH, BOPPARD (A.D. 1200). DRAWN BY W. H. ANSELL.

If *verandahs* are provided, they should have glass roofs. To give sufficient protection from driving rain, they should be 15ft. wide. They may, however, be replaced entirely by shelters to the sides of the house, if the couches can be wheeled out from the bedrooms into the shelters. *Balconies* are apt to darken the rooms below, if they are wide enough to be practically useful. They should, therefore, be placed over parts not frequented by patients, or converted into part of the ceiling of the room below. At Dannenfels an inequality of the ground is utilised to provide a large balcony or terrace level with the first floor, over cellars level with the ground floor. The *door* of the room should have a frame flush with the walls, and be free from panels or ledges which collect the dust. If the door opens into a well-ventilated corridor, it may be replaced in hot weather by a skeleton wire door, privacy being secured by a screen. Bolts should not be supplied to the bedroom doors.

If they have locks, the matron should have a master key in case of accidents. There should be some means of fixing the door open at various angles, to prevent slamming. *Cupboards* should have rounded angles; they should not be sunk below the level of the floor, and should have no dead space above. Movable wardrobes can be better ventilated than cupboards. The *floor* of the room may be of waxed and polished boards, or of well-fitting unpolished boards covered with linoleum. The latter should be all in one piece, and a trifle larger than the floor itself, curling up at the sides, to be fastened by a wooden fillet, as at Dr. Burton Fanning's new sanatorium. In some German sanatoria a material called *torgament* is used for flooring. It consists of wood shavings incorporated in some way with cement, and is warmer to the feet than the latter, while equally indestructable and capable of disinfection.

The *walls* may be of Parian cement, as in many hospitals, or of ordinary plaster, painted or papered with washable paper, or panelled with wood and varnished, or covered with lincrusta or similar materials. Wood-panelled walls are said to become infested with mice. An inexpensive method of transforming an ordinary lath and plaster wall is to paint it with silicate paint. The *ceilings* should be without cornice, with rounded angles. In some sanatoria they are of varnished wood panelling. They may, however, be whitewashed, painted or papered.

Arrangement of Bedrooms.—The bedrooms should be arranged in a single row, rather than on two sides of a corridor. The corridor, which may be paved with terrezzo or tiles, or covered with linoleum or some less noisy material, should end externally and have numerous windows, which should be opposite the doors of the bedrooms if there is adequate shelter to the north. They are intended to be almost constantly open. It was suggested to me by Dr. William Ewart that an offensive patient might contaminate the air of the corridor, and that this could be overcome by closing the door of the bedroom and letting the ventilator over it communicate with the outside by a shaft above the corridor. Another way would be to replace the corridor by a covered walk or verandah. No rooms should be placed to the north of the corridor, excepting such as can be left almost constantly open.

Sitting-rooms for Patients should be neither large nor numerous, excepting such as are really modified summer houses. Recreation pavilions should also be out of doors. The dining saloon must of course be large and well lighted and ventilated. During a good part of the year in England the meals could quite well be taken in a summer house or tent. A warming cupboard would be required for plates and dishes and a warm box to carry the food.

Accessory Rooms.—The lavatories, bathrooms, w.c.'s, cloak-rooms, and box-rooms should not be too far from the patients' bedrooms, but may be placed on the north side in built-out pavilions. No unnecessary luggage should be left in the bedrooms, and it is a good plan, if possible, for all ablutions to to be done in the lavatory, so as to keep the bedroom drier. In private sanatoria, however, this cannot well be done. In the Nordrach Sanatorium a douche apparatus with hot and cold water is placed in each patient's bedroom. Waste pipes always become foul unless capable of being mechanically cleaned, so that no fixed basins with narrow waste pipes should be employed, least of all in the bedroom. Sanitary arrangements may be constructed on ordinary principles. It is unusual to have tubercle bacilli in the excreta of such patients as would be admitted to a sanatorium. With water carriage there cannot possibly be any danger from the excreta; and with dry methods exposure to light and air or admixture with chloride of lime is sufficient to disinfect them.

Consulting and Waiting Rooms may quite well be in a separate pavilion or summer-house, as those who are not fit to walk so far would be seen in their bedrooms. Drug room, laboratory, room for Röntgen rays and photography, inhalation room and the like, would be put next the consulting room.

Heating.—The sanatorium may be heated by hot water or steam pipes, if care is taken not to allow charring of dust particles to take place, or over-heating of the rooms. Most of the German sanatoria are heated by low pressure steam pipes, as the quickest and most economical way of warming a large building. Open fires are invaluable for ventilation, but require more attention and are apt to be dusty. Closed stoves are only permissible with a cooling jacket, and in any case are of doubtful expediency. At Nordrach, where water power is abundant, some of the rooms are now heated by electricity.

Lighting should be by electricity, or failing this by lamps and candles. Gas is apt to render the air impure, unless special ventilating shafts are put for each jet. Incandescent gas-lamps with by-passes are not to be recommended. Acetylene is used in some sanatoria, but appears to me to be unsuitable.

Arrangement of the Sanatorium.—Such being the component parts of a sanatorium, it remains to consider how they may be best arranged. This, however, depends largely upon the site and the area of suitable ground. On mountain sides it is usual to build a sanatorium in several storeys; where more level space is available, the building may consist of a number of low cottages or villas.

Number of Floors.—There is some prejudice in this country against putting bedrooms on the ground floor; but where the foundations are properly built, with damp-proof courses and the like, and the ground is dry and well drained, it is not clear that buildings of one floor are any less suitable than higher ones, so long as sufficient privacy can be ensured. Couches and beds may be more easily wheeled out from the ground floor; no lifts, staircases, or balconies are needed, and there is no risk of one floor ventilating into the next. But in higher buildings a better view is obtained from upper floors, and the bedrooms above are more easily kept private and are quieter. And by suitable arrangement of the staircases, corridors, and approaches, it is quite possible to prevent the entrance of foul air into upper rooms. All corridors and staircases should have free and direct communication with the outside air. This also applies to cellar stairs. As regards relative cost of high and low buildings, this depends largely upon the amount of level space in suitable spots available.

Cottage Sanatoria.—Temporary sanatoria of tents, wooden buildings, or "bracken," are frequently interdicted by local authorities, and need not therefore be considered. In a large sanatorium the cottage system has both advantages and disadvantages. Different sets of patients can be readily isolated, as, for instance, if an infectious fever breaks out. A small building having a relatively larger wall surface than a larger one is more easily ventilated from all sides. This is an advantage in a sheltered situation, a disadvantage in an exposed one. Scattered small buildings need a relatively larger staff, and are more expensive to supervise. On the other hand, they are less "like an institution," and may therefore be preferred by some patients. In a cottage sanatorium some patients have necessarily to walk further to the common dining saloon, as the plan of having separate dining-rooms for each block is inconvenient and wasteful. The more concentrated the plan, consistent with free ventilation, the easier and the less expensive are the supervision and management of a sanatorium.

Ground Plan.—The chief varieties of possible ground plans for a sanatorium may be classed as follows:

1. Linear—straight, convex or concave.
2. Linear with wings or pavilions at a right angle.
    (*a*) Open quadrangle—three sides of a rectangle.
    (*b*) Closed quadrangle—not permissible.
    (*c*) Bayonet joint—two sides of a rectangle.
3. Linear with wings at an obtuse angle.
4. Parallel lines joined by others at right angles.
    (*a*) Letter T. (*b*) Letter H.
5. Radiating.
    (*a*) From a straight line.
    (*b*) From a central point.
    (*c*) From a convex corridor.

Any of these plans may be arranged with interceptions.

It is not possible to say that any one of these plans is best in every case, as the nature of the ground and the degree of natural protection have to be taken into account. The less the natural protection, the greater the need of protection by means of a high building or of wings. In such a case the plan adopted at Hohenhonnef is a very good one, although the number of luxurious sitting-rooms there is apt to tempt patients to remain too much indoors.

Liegehallen.—There is some difference of opinion concerning the deep verandahs provided at many sanatoria, where patients rest in company on their wicker reclining chairs. Febrile patients, who most need to rest, are best kept in more or less seclusion; but, for the hour's rest about meal times, there is no reason why non-febrile patients should not use the common verandah or "liegehalle." But such a verandah in front of patients' bedrooms interferes with quiet and privacy; so that "liegehallen" are often placed on either side of the building, somewhat like wings.

Covered Corridors for walking exercise are also objected to by some; but, if they are very freely ventilated, they are useful in wet weather, as there is no special advantage in letting a phthisical patient get wet. Where there are pine woods, however, a much better walk can often be afforded under this natural shelter. There is an increasing tendency to keep patients away from the building during the day, and if the grounds are of the right kind this is by far the best way.

In the treatment of consumptive patients we should try to reverse the usual conditions of town life, and instead of spending twenty hours out of twenty-four in an ill-ventilated set of rooms, we should make our patients spend the night in the airest of rooms and the rest of the time out of doors, and should plan the details of the sanatorium in accordance with such a purpose.

Jane Austen's House at Bath.—Another of the series of tablets which the Bath Corporation are placing upon houses of historic interest in the city was unveiled on Thursday. This was on the house once occupied by Jane Austen. The ceremony was performed by the Rt. Hon. E. R. Wodehouse, M.P.

Collapse of a Roof.—The roof of the Siemens' department of the Dowlais Steel Works, collapsed on Tuesday, last week, whilst the men were in the act of repairing it and fixing up a girder. Seven men were injured.

The Death of Mr. A. G. Thomson, Engineer, occurred on Tuesday afternoon, last week, at his residence, Red Court, West Ferry. Deceased, who was the only son of the late Mr. William Gordon Thomson, of Fairfield, Broughty Ferry, was a partner in the well-known firm of Messrs. Thomson, Son, and Co., engineers and ironfounders, Douglas Foundry, Dundee. He also carried on the successful business of the Clepington Spinning Company.

Devon and Exeter Architects' Society.—The members of the above society had an interesting excursion to Dunster and Cleve Abbey on the Saturday before last. Dunster Church, with its beautiful oak carved screen work, was first visited, and then the party was conducted over the Castle; its old masonry, ancient charters with the seals attached, carved oak, the bed which was slept on by Charles II. with the secret hiding place in the wall, the room occupied by the Prince of Wales when a guest, old paintings, and the rare painting on leather, ponderous matchlocks and relics of sieges being inspected with much interest. The members were afterwards entertained at luncheon by the ex-president, Mr. J. Crocker, at the Luttrell Arms, after which they were driven to Cleve Abbey.

Views and Reviews.

ARCHITECTURAL PHOTOGRAPHS.

Messrs. S. B. Bolas and Co., the well-known architectural photographers, of 77, Oxford Street, W., have hit upon a distinctly happy idea. They have prepared a comprehensive series of views of Westminster Abbey which they are publishing in twelve shilling packets each containing eight or nine collotype prints (half-plate size). We have never seen finer examples of architectural photography, and the extremely low price at which they are offered will, no doubt, command a sale large enough to justify the publication—which, we understand, is in contemplation—of other sets descriptive of other cathedrals. Good architectural photographs have a genuine educational value; one cannot, of course, study architectural features from photographs so well as from the building itself, but such photographs as these afford the best available substitute for a personal visit. We reproduce, on a slightly reduced scale, the photograph of the Confessor's Chapel which forms one of the second series, but it should be said that in the reproduction there is some slight loss in respect to the sharpness of detail.

SOUTH KENSINGTON STUDENTS AND THEIR WORK.

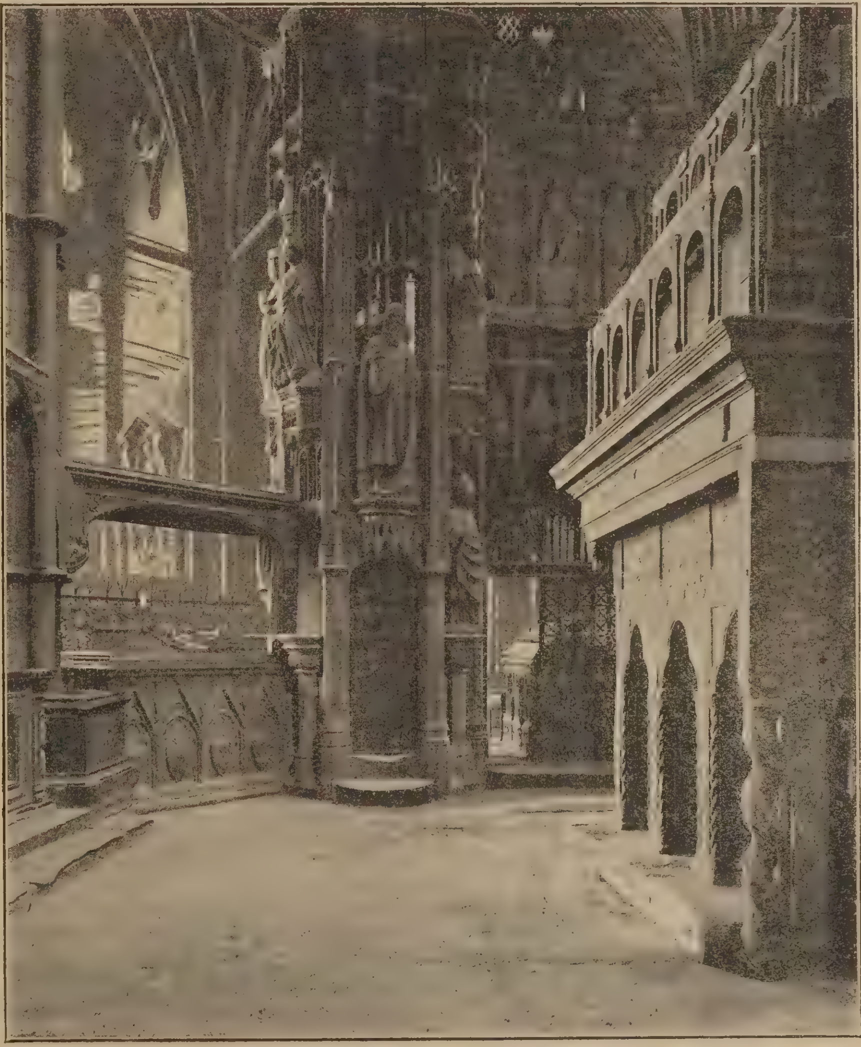
This book is published with the intention (to quote from the preface) of providing the Art student "with matter for thought and with a practical demonstration of the thoughts and work of others, and further with a guide to what the examiners of the Department of Science and Art require, if the student desires to attain success under their examination." To judge from the work now on view at South Kensington, other Art masters have also had the intention of providing their students with counsel of a similar description and have been very successful in divining the examiners' likings, several schools having gained quite a shower of honours in the shape of medals and book prizes. And the occurrence of certain names is frequent upon the premiated drawings, showing that individual students have also been similarly successful, though this may partly be accounted for by medals being sometimes given for a set of several drawings.

It is curious how small an influence the traditional historic styles of ornament appear to exert upon the drawings and designs produced by students nowadays; they are quite emancipated, and to judge from what is now on exhibition, the clever student is not aware that great things have been done in past ages. Not that the work is any the more original for that, it is only that the type chosen for imitation is different. Certain foreign books to be found in the Art Library have been largely drawn upon, and the work of three or four clever men of the present day has furnished the stimulus for most of the rest of their efforts. It is, perhaps, unfair to complain of young students' work being an imitation of something which has impressed them—one begins by imitating—but it is among fresh young minds that one expects to see invention, and certain of the drawings are the work of students who are already making a good income by the exercise of their talents, and really should scarcely compete with students pure and simple. (One student at least, who has had silver medals awarded this year, gained a gold medal two years ago.) It is the system of payment by results which forces masters to watch the opinion of the examiners, as shown by each year's awards, and do their best to satisfy it—the race between the examiner and the coach which is so characteristic of the present day—and which causes them to produce such books as this one.

The reproductions are well made on the whole, though slovenly printing here and there makes some of the smaller drawings unintelligible, and as one turns over the pages one comes every now and then upon a design which strikes one as practical; this is specially the case in the designs for lace and textiles. The student has not generally the advantage of having his designs reproduced, and therefore loses the teaching of necessity. Many of these drawings which look well enough on the page, and were considered worthy of medals, are quite useless for manufactures, because the effect of the repeat has not been sufficiently realized, and the processes are not understood. Extravagant ideas often occur to the student, and he develops them; this is one of the places where the counsel of the master should be of use. For instance, on page 70 is a design for a pulpit; the exterior is panelled, and the panels are filled with subjects. Facing the congregation is an upright panel, which is filled with a well modelled figure of a nude woman with her hair arranged in a strange fashion, suggesting Astarte. Even supposing that she is intended to symbolize the naked Truth, it does not require much reflection to convince one that a storm would arise in any church or chapel in which it might be placed—that it is, in fact, unsuitable for the purpose for which it was designed. This is, of course, an extreme instance, and it is not intended to suggest that many of the designs fail to anything like the same extent. Another case in which the counsel of the master would be valuable is when the motive of the design is a contorted and involved group of lines, with its counterpart, an affected simplicity of arrangement. The passion for these arrangements is passing, and it would be a mistake for students who have their living to get by designing for manufacturers to imitate the style of design which has found most favour with the examiners of late years. For the purpose stated in the paragraph quoted from the preface this book may probably be useful, but some of the mannerisms with which it is filled are already obsolete, and others are fast becoming so—in the world outside the examination rooms.

A W.

"National Competitions, 1896-97." An Illustrated record of National gold, silver, and bronze medal designs, models, drawings, &c. Edited and compiled by JOHN FISHER, Headmaster, Kensington School of Science and Art, Bristol. London: Chapman and Hall, Limited, 1899.



THE CONFESSOR'S CHAPEL AT WESTMINSTER ABBEY.

DISPUTED POINTS UNDER THE LONDON BUILDING ACT.

BY GEORGE H. BLAGROVE,

Certificated Surveyor under the Act; Author of "Dangerous Structures," "Shoring and its Application," &c.

(Continued from page 71, No. CCXXXIX.)

II.—OPEN SPACES ABOUT BUILDINGS.

THE monetary value of building sites is largely affected by Part V. of the Act which regulates the heights of buildings and the open spaces about them. Private speculators, advised by agents and auctioneers who are ignorant of the Building Act, have often been persuaded to purchase sites in London, and have found out, when too late, that the Act would not allow them to build to the extent contemplated, and that therefore they could not obtain a sufficient return for the capital invested. In such cases serious losses may be incurred. The way to avoid them is to ascertain, before purchasing a site, all the conditions to which it may be subject. If the intention is to remove an existing building and erect a new one of greater magnitude, this can scarcely ever be done without the special consent of the London County Council. Such consent should be obtained, if possible, before the site is purchased or taken upon lease. It is very difficult, in most cases, to pronounce an opinion as to whether the consent is likely to be granted or refused. It may be granted in one case, and refused in another, when there appears to be but little difference between the two. I do not wish to imply that the decisions of the Council are inconsistent; but they may appear so to those who do not know all the circumstances of every case.

The open spaces in the rear of buildings, as provided under Section 41 of the Act, constitute a great benefit to the people of London who are by no means suffering from a superfluity of fresh air. In streets formed after the commencement of the Act, the open space is (except in certain cases) to commence at the level of the pavement in front, or of the ground at the rear boundary, whichever is higher. This provision, however, is not likely to take effect in new streets formed in the heart of London, where builders usually avail themselves of Section 43, which allows them to rebuild upon sites previously occupied. It is in suburban localities that Section 41—1 operates in securing many a patch of ground against future encroachment.

Section 41 as applied to Alterations of Buildings.

There exist in London many old buildings which are not constructed in accordance with Section 41 of the present Act. When it is proposed to alter or add to such a building, regard should be paid to Section 209, which provides that alterations or additions shall, to the extent of the work done, be subject to the provisions of the Act, and of by-laws thereunder relating to new buildings. A section from front to back of the existing premises should therefore be drawn, with the horizontal line and the diagonal line, as directed in Section 41, the former line being drawn at 16ft. above the pavement level. Then no new addition can be erected above the diagonal line, except such chimney stacks, dormers, &c., as are allowed under Section 41—1 (iii.) (*e*), and a w.c. and ash bin within 9ft. above the horizontal line.

If the builder wishes to make some new addition above the diagonal line, he must apply for the consent of the London County Council. The application must be accompanied with plans showing the existing building and the proposed addition. The plans of the existing building need not be certified by the district surveyor, because their accuracy can be tested by comparing them with the actual building. The builder, however, should be careful not to take down any portion of the building that may already exist above the diagonal line until after the required consent to rebuild has been obtained. Plans of the existing building, certified by the district surveyor under Section 43, may be of use for purposes of evidence in a court of law; but it appears that they do not avail for purposes of applications to the Council in cases of alterations or additions, because Section 43 commences with the words: "When any person intends to erect a domestic building, &c."; and there is no reference in the Section to alterations or additions.

Not long ago, an attempt was made to apply Section 43 to a case of alterations and additions. Plans of an existing building were prepared, and were duly certified by the district surveyor. Plans showing proposed alterations were also prepared, and the Council were asked to sanction these, as deviations from certified plans, under Section 43. But the applicants were officially informed that, as it was not the intention "to erect a domestic building," but only to alter an existing one, the matter was not one which could be the subject of an application under Section 43.

Can Portions Existing above the Diagonal Line be Taken Down and Rebuilt?

As it appears that Section 43 is not applicable to cases of alteration or addition, the question suggests itself, under what Section of the Act can part of a building, which is above the diagonal line, be taken down and rebuilt, without the special consent of the Council? It may well be argued that a principle which applies to the whole of a building ought to be applicable to any part of it; but it is doubtful whether a question in statute law can be settled in this way. It appears to me, that to take down part of a building is to commence an alteration; and Section 209 provides that alterations shall be subject to the provisions of the Act. Section 50 allows a topmost storey to be raised so far as is necessary to bring any habitable rooms existing therein into conformity with the provisions as to habitable rooms. But, with this exception, I do not know any Section that provides for the re-erection of a portion above the diagonal line, after it has once been taken down. It would be well if there were some authoritative decision upon this point.

Rebuilding According to Certified Plans.

Section 43, when it is applicable, appears to relieve a builder from the necessity of complying with the preceding sections in Part V., but not to relieve him in regard to subsequent sections. It cannot, for instance, invalidate the rules as to habitable rooms in Section 45; and, of course, it does not affect the rules in Section 70, which belongs to Part VI. Nor does the permission to rebuild in accordance with certified plans carry with it the right to reconstruct a roof formerly existing at a steeper angle than 75deg. Section 50, indeed, allows the height of a building to be increased, so far as to allow of habitable rooms in the topmost storey. This would admit of steepening the pitch of the roof sufficiently to obtain a height of 8ft. throughout, not less than one half the area of each room, but it would not admit of making the roof steeper than 75deg. Anything beyond these modifications, in rebuilding from certified plans, would appear to be a deviation requiring the sanction of the Council.

What is a Deviation?

It was contended, in the case of *Paynter v. Watson*, that an increase of height (beyond that allowed under Section 50) in rebuilding from certified plans would not be a deviation within the meaning of Section 43 (i), which provides that the intended building shall be erected "so that no more land shall be occupied by the newly erected building than was occupied by the previously existing domestic building as so certified." It was contended that, as no more land was intended to be occupied than formerly, there would be no deviation requiring the sanction of the Council. On the other hand, it was pointed out that, under Section 43 (ii), if the person erecting the intended building "shall desire to deviate *in any respect* from the plan or plans certified by the district surveyor," he must apply to the Council; also that (Section 43 (i) the plans to be certified were required to show the extent of the previously existing building "in its several parts." But again, it was contended that the only plan required by the Act to be certified was a plan showing the extent of the previously existing building in its several parts on the basement. Thus the case really turned upon what were the plans required to be certified, from which no deviation was permissible without the sanction of the Council.

The decision of the High Court was, that the plans to be certified were not confined to ground plans or basement plans, but included plans showing every part of the building in every direction in which it extended. The conclusion to be drawn from this decision is, that plans to be certified should show the extent of the original building as completely as possible; for if there is any part which is not shown, or which cannot be reconstructed from the certified plans, such part cannot have the benefit of Section 43, but must be rebuilt in conformity with other provisions in Part V.

Can the Council Refuse to Sanction Deviations?

It does not appear that Section 43 empowers the Council to sanction a deviation which would be in contravention of any other part of the Act. But suppose a deviation to be in conformity with the Act, except as regards Section 41; can the Council refuse to sanction it under Section 43?

The wording of the Section is sufficiently clear (ii.): "If a person erecting the intended domestic building shall desire to deviate in any respect from the plan or plans certified by the district surveyor, it shall be lawful for him to apply to the Council, who SHALL sanction such deviations on such conditions as they may think fit, &c." It would appear that the deviations are to be submitted to the Council in order that they may impose conditions. A condition cannot mean a modification of a proposed plan. It would be impossible for the Council to sanction a deviation on condition of its being modified, because that would not be sanctioning the deviation. The conclusion to be drawn from the wording of the Section quoted above is, that the Council are not intended to withhold their sanction, although it may be desirable that they should have the power to do so.

(*To be continued.*)

New Patents.

The following abridged description is specially drawn for The Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all Patent matters.*

4220. Ornamenting Walls, Columns, Mouldings, &c.—Patentee: J. J. Kayll, of Promenade Square, Harrogate, Yorkshire. Coloured enamels are painted on the smooth ground or sand-blasted backs of opal glass facing tiles, and are burnt in by placing the tiles in a kiln or furnace. The tiles are arranged to form suitable designs or figures, and are cemented to walls, columns, mouldings, &c.

4418. Tiles, Roofs and Walls.—Patentee: C. L. A. Janoyer, of Rue de l'Eglise, Taverney (Seine et Oise), France. Undercut ribs under the tiles interlock with dovetail wood battens or bent plates. The upper edges of the tiles are formed with ribs or outstanding flanges to prevent the entrance of water past the joints, and the wood battens are rabbeted to receive the outstanding flanges of the lower tiles.

302. Window Shutter Fastenings.—Patentee: A. R. Hayward, of West Chinnock, Ilminster. A fastener for window shutters consists of a pin secured by a plate to the window frame, and slotted to receive a tongue pivoted. The shutter has a plate with a central aperture, and when closed over the pin the tongue falls down and prevents the shutter being opened from the outside.

Proposed Roman Catholic Church at Bearwood.—A committee which was appointed some time ago, to acquire land in the neighbourhood of Bearwood suitable for the erection of a Roman Catholic church and schools, have received an offer for the purpose from an anonymous donor of land of the estimated value of £1,000. The site is in the Lightwoods and Three Shires Oak Roads.

A Handsome Ptolemaic Column is in course of erection at Alexandria to commemorate the victory gained by the Anglo-Egyptian forces in the Soudan last year. The monolith was recently hoisted on to the pedestal before a distinguished gathering of local celebrities. The monolith is of massive red granite, and was excavated from the old ruins at Alexandria it weighs twenty-five tons, is 34ft. long and 3ft. 6in. in diameter. The height of the monument, when complete, will be 60ft. The excavations and the erection of the monument were due to the energy of Tchiess Bey, the Government hospital doctor, who erected a similar column in memory of the Queen's Jubilee.

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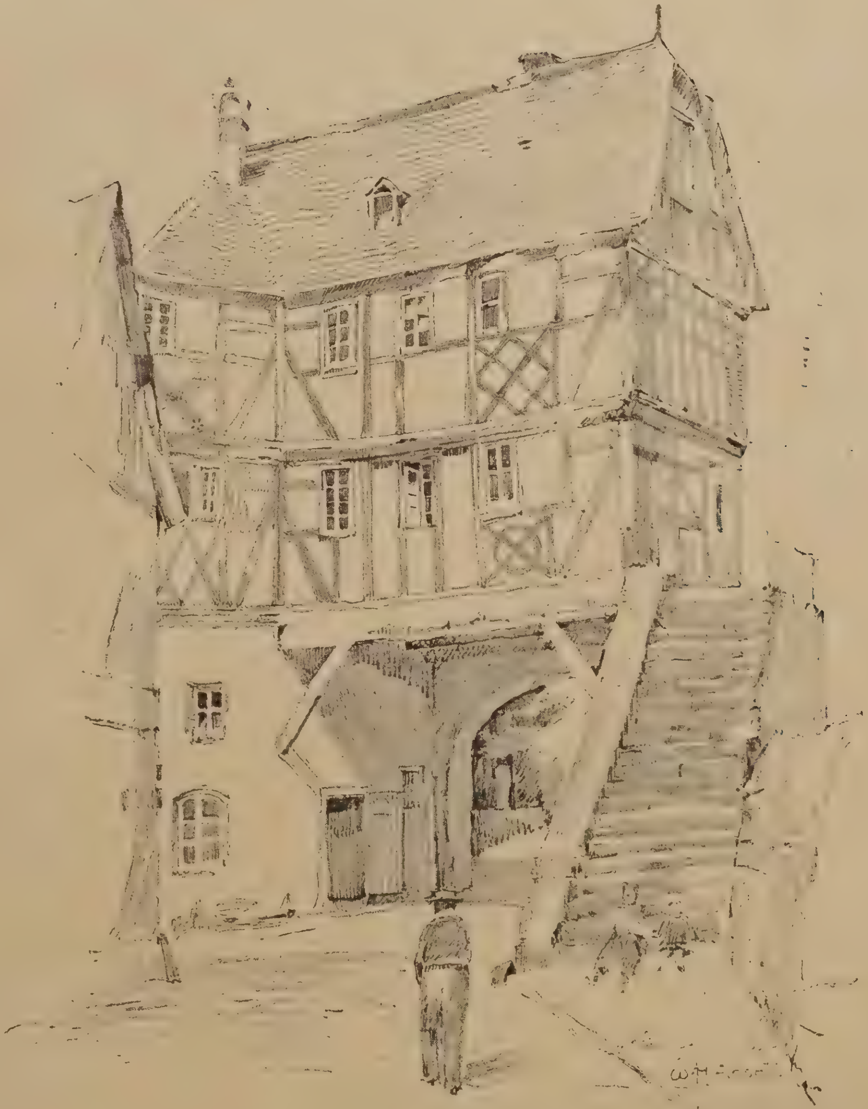

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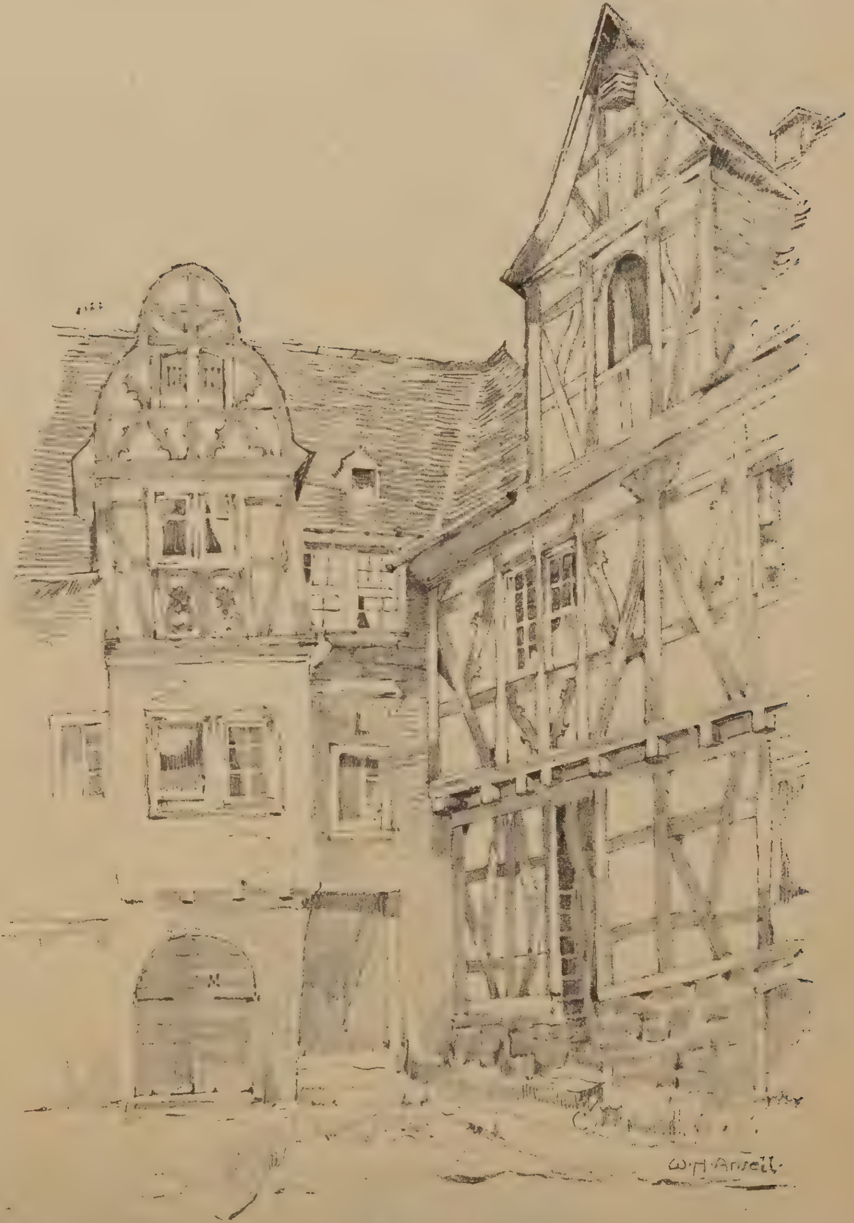

A CORNER AT BREY.

SOME RHENISH VILLAGES. Sketched by W. H. Ansell. (*See p.* 97).

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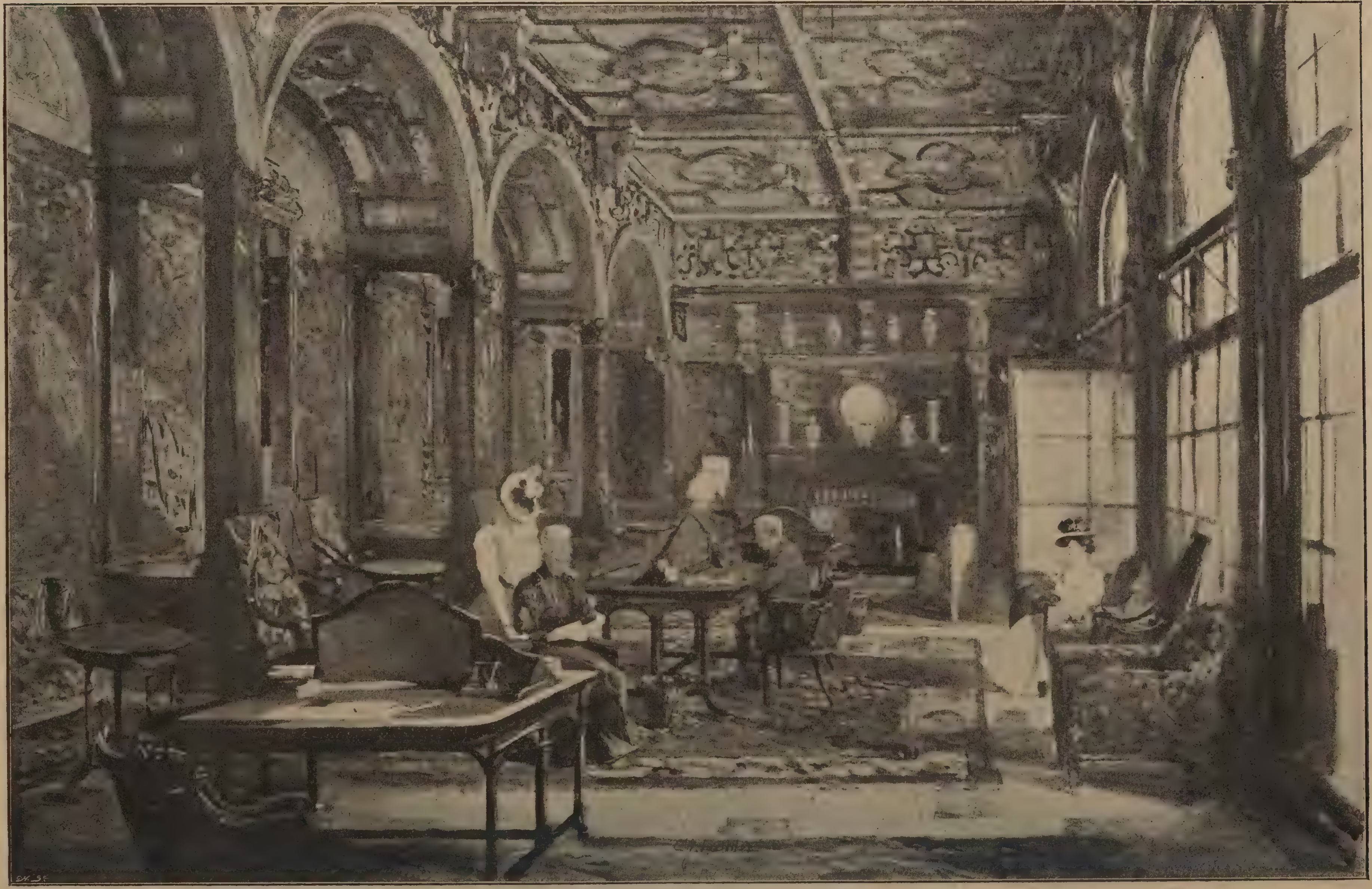
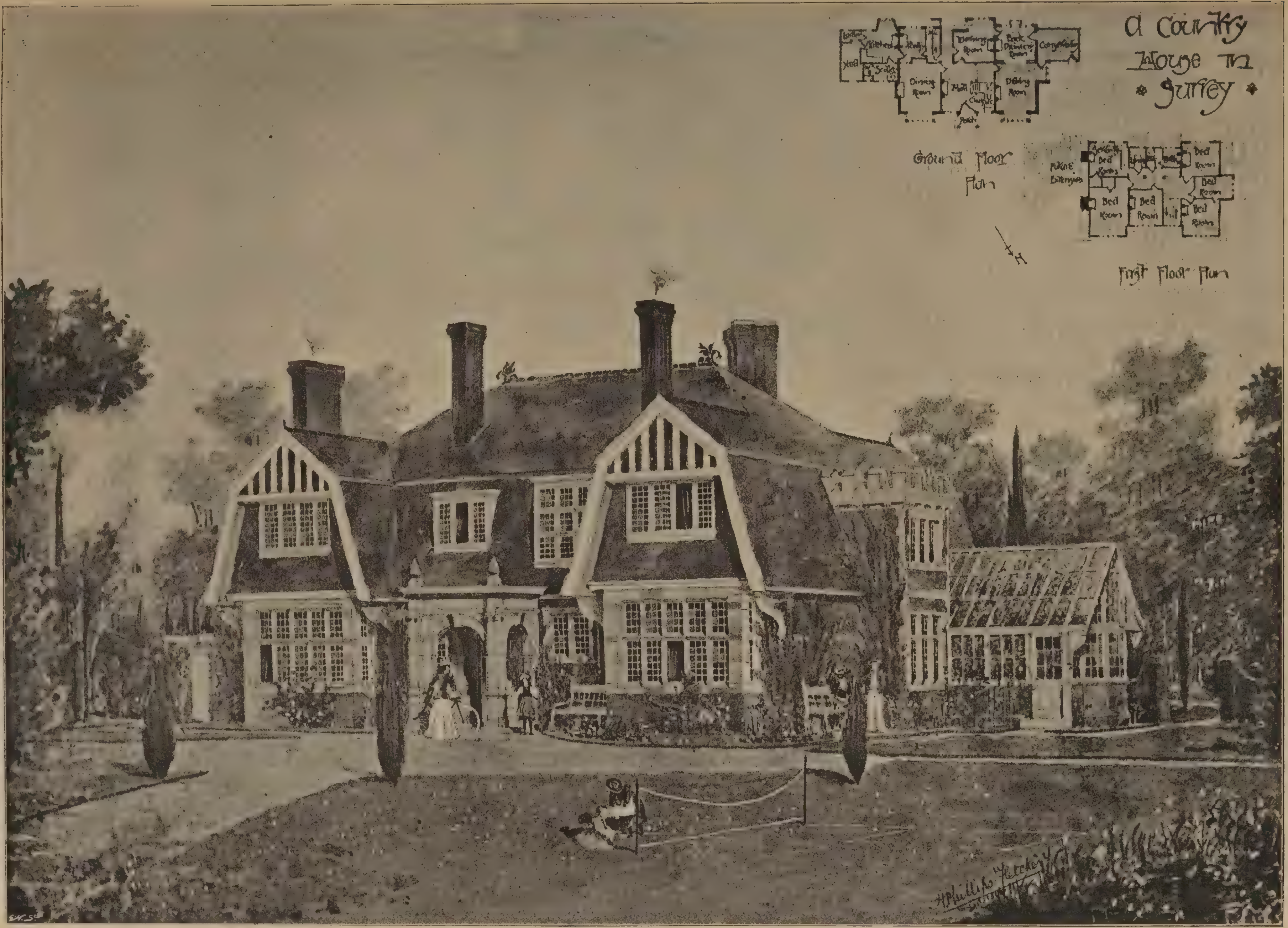


WRITING ROOM, SAVOY HOTEL. T. E. COLCUTT, ARCHITECT.

SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, WEDNESDAY. SEPTEMBER 20, 1899.



A COUNTRY HOUSE IN SURREY. H. Phillips Fletcher, Architect.

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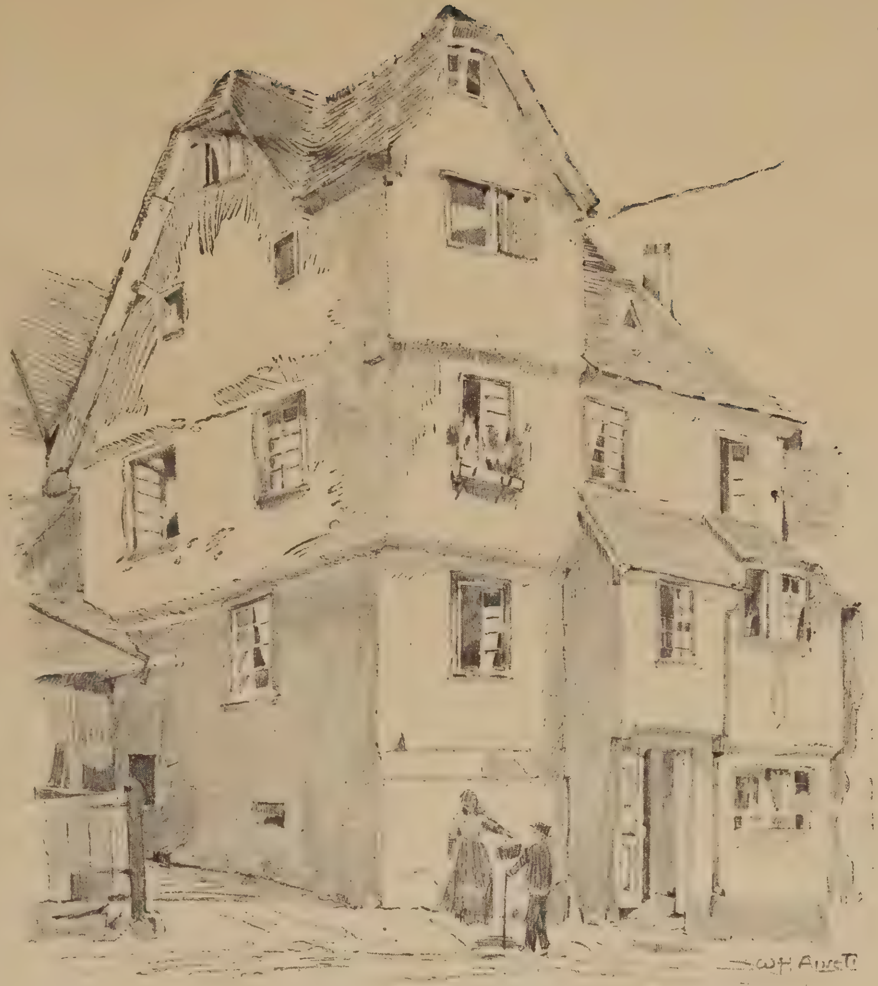
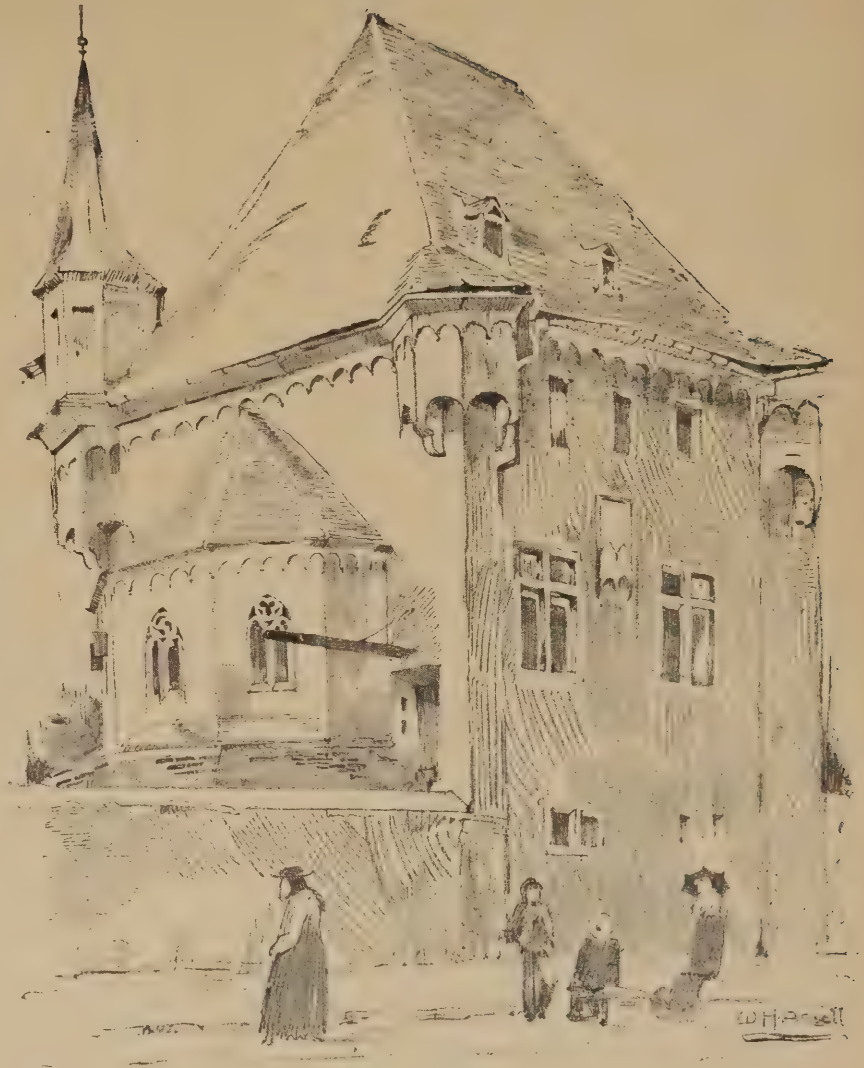


A STUCCOED HOUSE IN RHENS.



A HOUSE AT BOPPARD.

SOME RHENISH VILLAGES. Sketched by W. H. Ansell. (*See p.* 97).

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Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

A BOOK ON BRICKLAYING.

To the Editor of THE BUILDERS' JOURNAL.

FULHAM, S.W.

SIR,—I should feel obliged if you could inform me which is the best book written on bricklaying for a beginner.—Yours, &c.,

J. B. S.

The only book of the kind we know of is "The Rudiments of Practical Bricklaying," by Adam Hammond, price 1s. 6d. This can be obtained from Mr. B. T. Batsford, of 94, High Holborn, London, W.C.

A GROUND OF ERMINE.

To the Editor of THE BUILDERS' JOURNAL.

GREAT YARMOUTH.

SIR,—A few weeks back you very kindly gave me some valuable information *re* a certain coat of arms. Will you now tell me whether the ground of "ermine" should be white or silver.—Yours, &c.,

GREY-FRIARS.

Ermine in heraldry is blazened *argent* with *sable* tails, *i.e.*, the ground is white with the conventional black spots. Silver should be represented as white on a pointed shield, or as a plain ground in sculpture and engraving.—G. C. R.

QUANTITY SURVEYING CLASS.

To the Editor of THE BUILDERS' JOURNAL.

WALHAM GREEN, S.W.

SIR,—As a constant reader of your journal, I shall be obliged if you will inform me what would be the best and most practical evening classes on Quantity Surveying you would advise joining, due regard being given to the economical side of the question.

W. F.

There are good classes at King's College, City of London College, and University College. We should advise our correspondent to apply for the prospectuses and see which class would best meet his convenience.

BOOK ON MECHANICS AND PHYSICS.

To the Editor of THE BUILDERS' JOURNAL.

NORTH SHIELDS.

SIR,—Would you kindly give me the name and publishers of a book on elementary mechanics and physics, suitable for the preliminary R.I.B.A. exam. Yours truly,

W. S.

We would advise our correspondent to get William Briggs' "Elementary Text Book of Mechanics," published by W. B. Clive, price 3s. 6d.; and Professor Balfour Stewart's "Lessons in Elemental Physics," published by Messrs. Macmillan and Co., price 4s. 6d.

A HANDY BOOK ON CARPENTRY.

To the Editor of THE BUILDERS' JOURNAL.

WOLVERHAMPTON.

SIR,—What book do you recommend as most suitable for small jobs, repairs, &c.—Yours, &c.,

J. R.

It is rather difficult to advise you as to what would be the best book for your purpose without knowing something further of your requirements. Probably, however, Tredgold's "Carpentry," published at 25s. by Crosby, Lockwood and Son, would best suit your purpose. The same firm publish a useful little handbook called "The Woodworker's Handy Book of Manual Instruction," at 1s.

SETTING OUT AN IONIC CAP.

To the Editor of THE BUILDERS' JOURNAL.

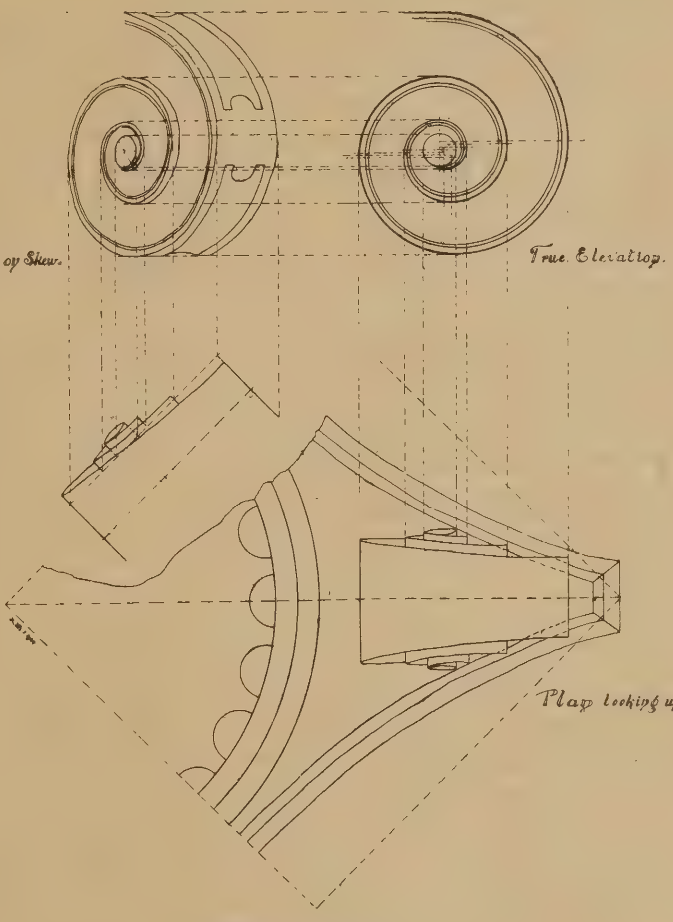
MANCHESTER.

SIR,—Would you kindly, through the medium of your paper, give me a simple and yet correct way for the setting out of an Ionic cap, that would be of use in the full detailing of same in the drawing office, giving both plan and elevation.—Yours, &c.,

H. B.

The drawings on this page will illustrate the method of drawing the volute in foreshortening. First the plan is laid down and the volute drawn out in correct elevation (by Goldman's method in this case). Then the plan is again drawn at the required angle, and the lines are projected up, meeting the corresponding lines projected from the elevation, thus fixing the required points. The volute can then be drawn in by hand.

R. W. C.



SETTING OUT IONIC CAP.

GYPSUM.

To the Editor of THE BUILDERS' JOURNAL.

STOCKBRIDGE.

SIR,—Answers to the following questions would be of great service to me, and, doubtless, instructive to many other readers of the BUILDERS' JOURNAL:—

1. Is gypsum used for any other purposes besides making plaster of Paris?
2. Where is gypsum obtained? And what is the production of gypsum in England in the last decade?
3. What is the best way of using plaster of Paris when casting in gelatine moulds?
4. Is there any profitable way of using old plaster?

STUDENT.

1. Gypsum is used by brewers in some districts to soften the water used for making beer. A coarse kind of gypsum is also used as a fertiliser in districts where the raw material is cheap.

2. Alabaster or gypsum, the hydrous sulphate of lime occurring in the massive form, is largely used in the manufacture of plaster of Paris, for which there is a large demand, not only in the arts generally, but also in the Staffordshire potteries for the purpose of making moulds, a use which has gained for alabaster the name of "Potters' stone." It also forms the basis of stucco and certain kinds of cement.

Gypsum occurs in seams, veins, and nodules in the Kenper marls in Cumberland, Nottinghamshire, and Staffordshire, as well as in Derbyshire, Westmoreland, and Somerset. In Sussex gypsum is obtained from the Purbeck beds, reached near Battle in the sub-Wealden exploration boring, and it is found in similar strata at Swanage, in Dorsetshire.

The total production of gypsum in England for 1897 was 181,385 tons, valued at £66,978. The output has been steadily increasing since 1881, the largest amount being supplied by Nottinghamshire and Staffordshire. Although mostly obtained from mines, the whole of the gypsum raised in Somersetshire is from open quarries near Watchet.

3. Plaster of Paris—known in the trade as "plaster"—is used in various forms when casting in gelatine moulds. For small enrichments, such as bedmoulds, it is simply gauged with pure water; but for large enrichments such as large cones, friezes, &c., the plaster is gauged with water containing a small percentage of liquid alum which accelerates the setting of the plaster and enables the cast to be extracted from the mould before the heat, generated by the plaster, softens the face of the mould and spoils the cast. For extra large casts which are generally made with fibrous plaster, the seconds are usually gauged with water containing a small percentage of size-water, which delays the setting of the plaster and enables the workmen to lay and brush the scrim and wood laths which are used to strengthen the casts.

4. Old plaster, in large quantities, may be profitably used for the manufacture of parian cement, provided the plaster does not contain any lime or lime water, which is sometimes used to prevent the plaster swelling.

W. MILLAR.

MODEL ANSWERS TO EXAMINATION QUESTIONS.

Answers to Questions set in the Examination held by the Society of Architects in April, 1899.

BY G. A. T. MIDDLETON AND R. W. CARDEN, ASSOCIATES R.I.B.A.

(Continued from page 74, No. CCXXXIX.)

III.—ARCHITECTURAL HISTORY.

(Part III.)

8. *Describe, with sketches, one of the following buildings: Constitutional Club, London, Imperial Institute, Natural History Museum.*

(Of course in answering this question and the last, the candidate who was well acquainted with the Constitutional Club would have a decided advantage over other competitors, for he could contrive his answers so that half his answer to No. 7 would answer nearly all that was required for No. 8. This appears to have been an oversight.)

The Constitutional Club.—This has already been described as part answer to the last question (see Part II.), but in this instance sketches are asked for as well.

The Imperial Institute was the outcome of the Jubilee of 1887, and was won in competition by T. E. Collcutt, Esq.

Its elevation is divided into five portions—centre and wing pavilions highly ornamented, and intermediate portions subordinated. The chief entrance is in the centre and spanned by a rather low arch, giving emphasis to the internal height as one proceeds up the broad steps. Above the entrance is a balcony of four bays, the abutments of the end arches being slightly projected and carried up till they break into octagonal turrets with lesser similar turrets at their angles. Over the arcade and between the turrets is a steep pointed gable.

Behind this—marking, as it were the "crossing"—is the enormous tower, absolutely plain, except for small windows, until the belfry stage is reached. Here there is a bold cornice, and above it double windows in each side and ornate flying buttresses at the angles to take the thrust of the cupola.

The wing pavilions are flanked by octagonal turrets with steep gables somewhat as described above.

The ground stage of the other two portions consists of a broad loggia in four bays; and each bay is marked off in each of the other floors by pilasters. These bays are crowned by gables.

The Natural History Museum, South Kensington, is one of the works of Alfred Waterhouse, Esq., R.A. Its style is Romanesque.

The entrance is a broad and deeply recessed round arch in five planes, and is surmounted by a flat gable containing two tiers of windows. This gable is flanked by towers pierced with windows in each stage, the uppermost storey being octagonal and crowned by a steep roof, with pinnacles at the angles.

The main portions of the building are recessed back considerably and consist of a long and rather low range of eleven arcades. It is difficult to describe this, but perhaps it is permissible to say that the centre block is flanked on each side by a "nave" of eleven bays. Each bay is delimited by pilaster buttresses running through ground and first floors, and being terminated by wild animals or birds, symbolical of the uses for which the building is intended. The ground floor windows consist of two lights under a square head in each bay; the first floor windows are also of two lights coupled under round arches. Two-light dormers give light to the second floor.

The end pavilions are to a certain extent repetitions of the "nave," but of two bays each only, the pair flanked by boldly projecting buttresses. Above the first floor is a range of five windows surmounted by a parapet, above which the building becomes octagonal and is crowned by a steep roof.

9. *Give a section of the Pyramid of Cheops, and a short description of its construction, dates, &c. Or:*
Give plan and elevation of the Tomb of Darius, at Naksh-i-Rustam. (This and the following questions were voluntary.)

The Pyramid of Cheops (or Suphis) is one of a group of three erected at Gizeh, near Cairo, and belongs to the 4th dynasty—probably about the year 3700 B.C. It is almost a square on plan, of 760ft. sides, the sides meeting in a point at the summit (480ft. high). It consists of an enormous mass of limestone, once cased with red granite, which did not follow the slope of the sides, but diminished in courses, or steps; of these steps there were 203 varying considerably in height. It was built for the King as a tomb that should last for ever, and that should keep the bones of the monarch hidden completely from the eye of humanity. For this purpose the entrance was made by no means direct. The portal is placed at a considerable height above the ground, and the passage therefrom leads steeply downwards to a chamber far below the surrounding land. At a point in this passage, just within the mass of limestone, rises another passage, an imaginary horizontal line almost bisecting the angle between the two corridors. This second passage leads straight up to the burial chamber, and about half-way up its height two other passages open out, one of them leading horizontally to a chamber (called the Queen's Chamber, though no queen was ever buried there), and the other being a rough hewn tunnel zigzagging down until it reaches the first (or entrance) passage, at a point slightly above the lowest chamber.

The principal galleries (or passages) are lined internally with huge blocks of granite, worked with the most admirable precision and truth of surface. The constructional expedients employed in order to make crushing by the superincumbent mass an impossibility are equally wonderful. Each course in the walling of the galleries projects until the space is sufficiently narrow to admit of being spanned by a single slab of granite. The royal chamber, which was guarded by a granite portcullis, is a rectangular apartment, ridiculously small when compared with the vast extent of the pyramid that contains it. Above is a series of four chambers, apparently only formed as another means of protecting the royal remains from being crushed. The final expedient for distributing the load is an arrangement of two slabs of granite abutting at an angle of about 35deg. It would be impossible to suggest any improvement upon this construction, even with our present knowledge of iron and steel work. An arch might conceivably be crushed, and a single slab would probably give way under the load; but these sloping slabs, each with several thousand tons of abutment, may well last for ever.

10. *Describe, with plan, section and short description, the Church of St. George, at Thessalonica; or, give similar description of the Mosque of Cordova.*

(The wording is copied accurately from the set of questions, and shows that no great care was bestowed upon the preparation of the paper. This would probably account for its unusual severity.)

The Church of St George at Thessalonica is built with all the characteristics which the Romanesque (?) style developed in the east. In plan it is a simple circle with a small projection at (presumably) the east. The walls of this circular structure are 20ft. in thickness, pierced by eight great semi-circular arches, one of them being larger than the rest and giving access to the addition spoken of above. It is surmounted by a hemispherical dome, the drum of which is pierced by eight semi-circular openings. The shell of this dome is thinnest at the crown, and the outward thrust at the springing is rendered more vertical by the superimposed solid wall whose only duty is apparently to carry a light wooden roof. Internally it is decorated with mosaics which probably date from about 400 A.D., though there is nothing by which an exact date may be arrived at. The outside is as plain as it well could be, and has on one side a slender minaret as at Sta. Sophia at Constantinople. We have described this church as eastern Romanesque in deference to the various text books on the subject. Our own conviction is that it is purely Byzantine, for the following reasons:—It is circular on plan, arcaded into eight bays: this certainly recalls the Byzantine octagonal baptisteries. It is domed, the dome being filled with mosaics: as at Ravenna and elsewhere. It has a minaret attached to it: this is also an accompaniment of Sta. Sophia, Sant. Antonio, Padua, and other churches—all Byzantine.

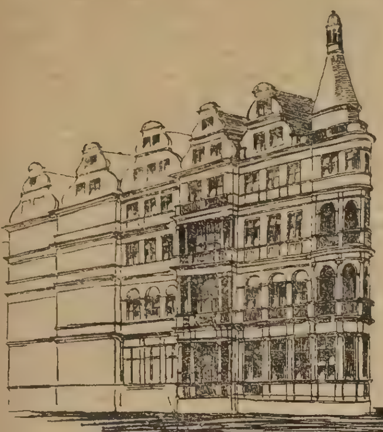
The Mosque at Cordova was commenced in 786 by Abd-el-Rahman. It is an enormous rectangular building 420ft. by 375ft.; its height, however, is in great contrast, being not more than 30ft. Internally it is divided into thirty-three aisles in one direction, and into eighteen in the other, the columns supporting originally an elaborately carved and painted roof. This has been removed and a brick vault put up in its place. The majority of the columns were taken from the ruined Roman cities of Spain, and this may account for the lack of height, the height of the order being governed by the length of the columns found. Even the builders themselves realised this great failing and sought to solve the difficulty by putting arch over arch (see section) in the most elaborate profusion. The sanctuary, built in 965 A.D., is still more elaborate. It seems that in this building Byzantine artificers were employed frequently, though not entirely, the architectural style being purely Moorish.

"Restoration" of Old Churches.—W. H. J., in writing to the "Morning Post," makes a suggestion that museums should be established in each diocese to receive relics, such as old fonts, pews, &c. These should not be sold or thrown away as at present when removed for the purpose of giving room for some memorial, and a severe penalty, he suggests, should be inflicted on all who disregarded this rule.

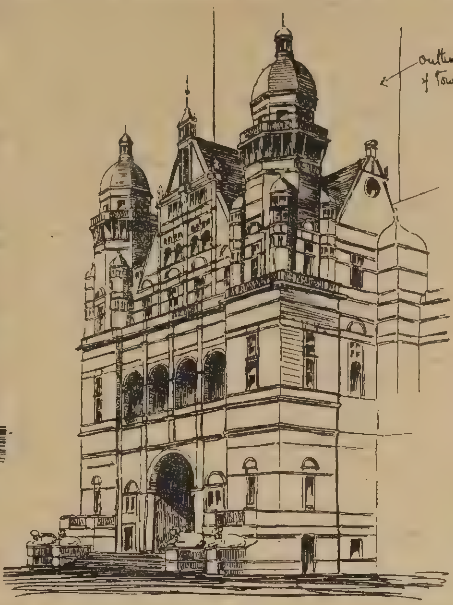
A New Congregational Church at Barry, the memorial stones of which were laid on Wednesday, is to be erected, at a cost of about £6,000. Accommodation will be provided for 750 persons. At the northern front will be erected a tower, surmounted by a tall spire. The main portion of the building will be of red brick, with Mansfield stone facings, and on the interior will be a gallery running round, space being reserved for an organ loft, while beneath will be provided the usual church offices.

New Organ at Dewsbury.—Messrs. Abbott and Smith, of Leeds, have just completed a fine organ for St. Philip's Church, Dewsbury, and it will be opened shortly by Mr. S. Pilling, of the Hagg, Mirfield. The instrument comprises great, swell, and pedal organs, with couplers, as follow:—Great: Large open diapason, 8ft.; small ditto, 8ft.; hohl flute, 8ft.; dulciana, 8ft.; principal, 4ft.; harmonic flute, 4ft.; and posaune, 8ft. Swell: Lieblich bourdon, 16ft.; violin diapason, 8ft.; lieblich gedact, 8ft.; viola, 8ft.; voix céleste, 8ft.; gemshorn, 4ft.; horn, 8ft.; and oboe, 8ft. Pedal: Open diapason, 16ft.; bass flute, 8ft.; and bourdon, 16ft.

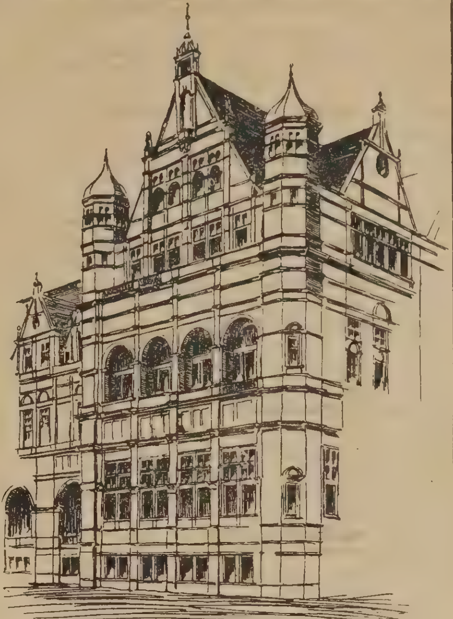
Popularity of Pictures.—Mr. Councillor Alden, M.A., has now reported on his examination of the returns of the voting on the pictures exhibited at the recent picture exhibition at West Ham. The most popular picture appears to have been "Christ the Consoler," by Rudolph Blind, which received 733 votes at Canning Town, and 1,158 at West Ham. The second picture on the voting list, both at Canning Town and West Ham, was "The Gambler's Wife," by Marcus Stone, while the third was Lady Butler's "Inkerman," the voting for which was 370 at Canning Town, and 746 at West Ham. Statistics prove that these exhibitions have been better patronised than any similar exhibitions in the whole world.



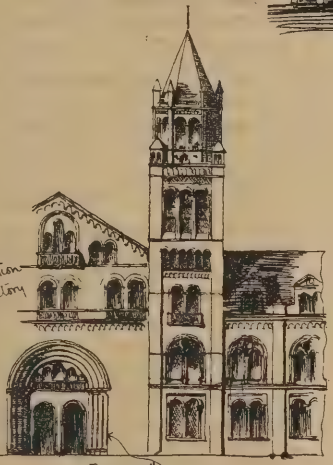
Sketch of Constitutional Club

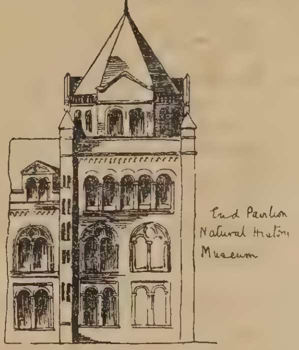


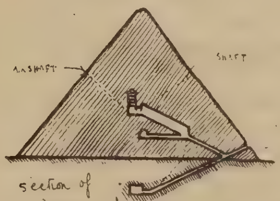
Centre block of Imperial Institute



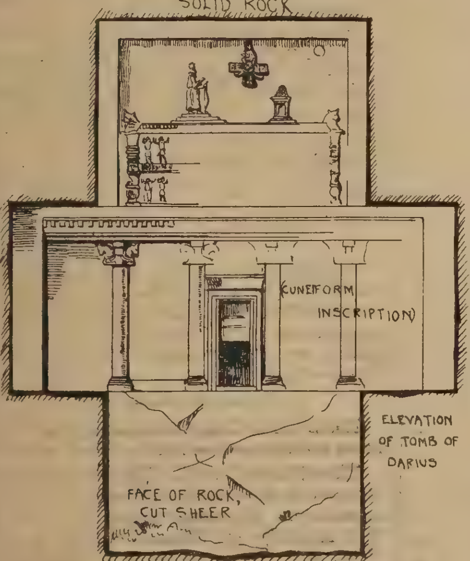
Imperial Institute end block


Central Portion Natural History Museum
Too Small

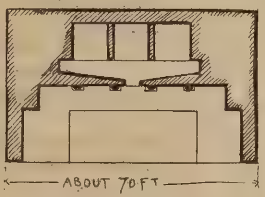

End Pavilion Natural History Museum



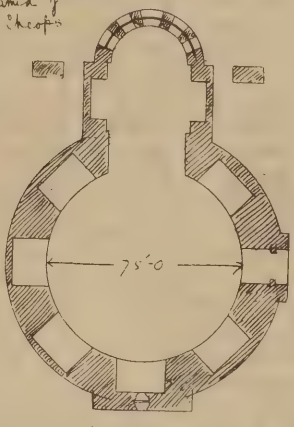
section of Pyramid of Cheops



ELEVATION OF TOMB OF DARIUS



PLAN OF TOMB OF DARIUS



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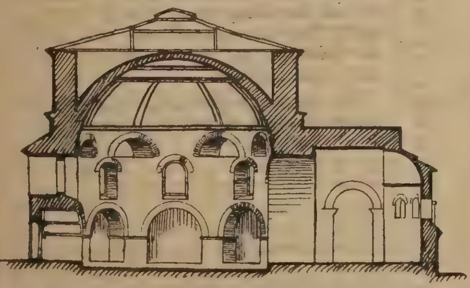
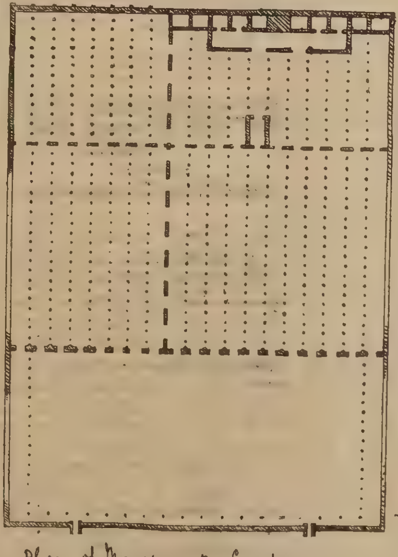
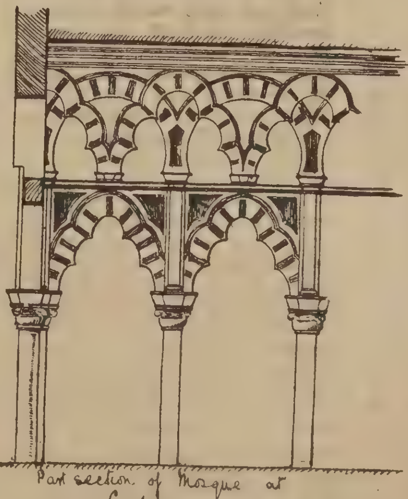


Section of S. George's, Thessalonica



Plan of Mosque at Cordova.



Part section of Mosque at Cordova

ILLUSTRATING ANSWERS TO EXAMINATION QUESTIONS 8 TO 10.

Correspondence.

SPOILING THE OLD COLLEGE AT BROMLEY.

To the Editor of The Builders' Journal.

Catford.

Sir,—I should like to draw your attention to the action of the trustees of the old college at Bromley, Kent, which is removing much of its old beauty. The college was built in 1666 and the red bricks and tiles have assumed a very rich red colour, but owing to the advice of the architect (or more truly, I believe—surveyor) they have resolved to remove the old tiles, and substitute modern machine-cut ones of a lighter tint. On the authority of the chaplain, I may say that there has been no complaint of leakage, the tiles serving their purpose perfectly well. The tilers have already begun their work, and one side of the first quadrangle is almost finished, with what effects may easily be imagined. Is there not any means by which pressure could be brought to bear on those in authority when the harmonious and striking beauties of such a place are at stake? If anything can be done it ought to be done at once as there is no time to lose. The chaplain has done all he could to bring his influence to bear but it has been in vain. Of course, I am only an outsider, but should very much like to know if anything could be done to check such wanton change.—Yours, &c., W. H. TODFER.

IS OUR EXAMINATION SYSTEM A FAILURE?

To the Editor of The Builders' Journal.

Dear Sir,—Having had a fairly large experience in examinations, it has struck me that our examination system does not show which student is the best. Certainly the examination shows which student is most capable of answering the questions set, but when we remember how the students have been prepared for the examination we must acknowledge that the system is far from perfect. Some of the chief causes of the failure are, to my mind, as follow: The examiner is seldom a practical man, being often only qualified to set the questions because he has distinguished himself in such a way as to bring himself to the notice of the authorities who appoint the examiners. The questions set are such that can be answered from the text book, and do not give the candidates an opportunity to exercise their common sense, or, rather, to think out a solution for themselves; one frequently meets with such opportunities in practice but seldom in examination, and it must be remembered that the possession of a retentive faculty by no means implies the possession of a creative one. By a careful study of past examination papers it is possible to guage the kind of question likely to be set. Teachers by these means often base their course of study on that which suits the particular examiner, instead of generally educating the pupils in study of the subject they are dealing with; beside this, the examiner is often the author of a text book, the perusal of which improves the candidate's chance of success by enabling him to answer the questions set so as to suit the examiners' fancy. Not that I mean to imply an unfairness on the part of the examiners, but, of course, they have their own notions of the way a question should be answered, and if a candidate can see what an examiner desires he is likely to put that answer to gain higher marks. I would suggest that questions be set to test the candidate's thinking powers so that even if he has not met with the problem set before he must tackle it with his knowledge gained previously in similar cases added to his reasoning powers. Many clever men at examinations find themselves left behind when compared with less brilliant men in the solution of everyday problems, and this fact alone lowers the value of many of the certificates obtained. The examiner should not be an author of a textbook on the subject he examines in, if another suitable man can be found. Again, more time should be given to do the work in than is usually allowed, so that a higher standard of answer could be expected, it being most unsatisfactory to allow candidates to "scrape through." Also, the student's knowledge should cover a fairly large ground, rather than run in a narrow channel, though, necessarily, the ground covered should not be too large, and, finally, common-sense, when exhibited, should be able to gain marks. These few alterations would, I think, improve the value of examinations, some of which, as they now stand, are merely "farces."—Yours truly,

K.

STONE CHURCH, KENT.

To the Editor of The Builders' Journal.

Kilburn, N.W.

Sir,—With reference to the enquiry in your last week's issue, perhaps the description of Stone Church (dubbed of old "The lantern of Kent") to be found in Sir Stephen Glynne's "Churches of Kent," may be of use to your correspondent.

There is also a fairly full account of the buildings in Murray's "Handbook to Kent."—Yours, &c. B. C. DEXTER.

To the Editor of The Builders' Journal.

Bromley, Kent.

Sir,—I am afraid "Enquirer" will find great difficulty in getting any book dealing with Stone Church, Kent, although Hasted's "County History" may give a short account of it, but this would probably be somewhat out of date. When writing his description, "Enquirer" will of course mention the fine example of the double plane of tracery in one of the nave windows. It is Early English, and dates from about 1245. I am under the impression that the church has been dealt with in the Kent Architectural "Proceedings," and would recommend "Enquirer" to approach the secretary of that society on the matter.—Yours faithfully, J. RUSSELL LASHBY.

To the Editor of The Builders' Journal.

Gravesend.

Sir,—A short account of this church by George Edmund Street, F.S.A., can be obtained for one shilling, from Canon F. W. Murray, The Vicarage, Stone, near Greenhithe.

H. VELLENSWORTH.

To the Editor of The Builders' Journal.

Sledmere, York.

Sir,—There is a work which may be seen at South Kensington Museum library and probably at other places, entitled "Illustrations of Stone Church, Kent," by Edward Cresy, architect, F.S.A., published by the Topographical Society, by H. Hooper, Pall Mall East, 1840. This work contains a good account of the church and is well illustrated.

JOHN BAKER.

To the Editor of The Builders' Journal.

Catford.

Sir,—There is a long article all about it in the "Builder" for February 11th, 1882.—Yours, &c., STANLEY TOWSE.

To the Editor of The Builders' Journal.

Liverpool.

Sir,—Stone Church associates itself with several important Kentish families, and more especially with those who have successively been the owners through some five centuries, of Stone Castle. In the last reign but one (Edward III.) of the period whose remains we have at present under our review, Sir John de Northwood held the castle, and about that time, or the previous reign, the second form of the Gothic, the Decorated, was displacing the Early English. This church was built in the place of an earlier one, founded probably in the Saxon times. In 995 we find Stone given by King Ethelred to the church, and see of Rochester, and the bishops often resided there afterwards. To that see the manor of Stone still belongs. In Stone Church we have a good deal of the trefoil, quatrefoil, rose, and other ornaments of the decorated Gothic.

The interior of the church exhibits another beautiful feature, tall and slender columns linked by light and elegant arches, dividing the nave from its two aisles. The chancel is seen through a single arch of a circular figure, which is so common in the early English style. A more flowing tracery prevails in the windows, especially in the large east one. Round the chancel runs a low range of trefoil beaded arches, in relief, springing from slight pillars of grey marble. The tower is extremely curious, for its scientific construction. In the nave and aisles it is open on three sides, which rest on arches, and, at the same time to give it stability, the fourth side is solid from the foundation of the earth, supported by two graduated buttresses of considerable strength and projection, and by two light and elegant flying buttresses that shoot directly athwart the north and south aisles. Such tact and precision are evinced in the design and execution of the tower, that it has been from the first, and is likely to remain, immovable and solid as any pieces of Gothic workmanship in the land. The chapel adjoining the chancel was built by a lord of Stone Castle in the reign of Henry VII.—Sir John Willshyre, Knt. Comptroller of the town and marches of Calais. He and his lady were interred under a rich altar, with an arched recess behind, where in addition to niches and other ornamental work there are a cornice of grapes and vine leaves, and the arms of Sir John and Dame Margaret.

In Gough's "Sepulchral Monuments" is engraved a remarkable piece of brass in Stone Church. Such memorials, we may take this occasion to observe, were but in very partial use before the middle of the present period; after that they became general among all ranks, were often extremely elaborate in point of ornament, and elegant in design. The brass in the chancel of Stone Church is laid in a slab in the pavement about 6ft. in length, and represents a priest in his canonical vestments, standing in the centre of a cross composed of eight trefoil arches, and adorned with vine leaves. The stem of the cross rises from four steps, and on it is a Latin inscription. Another inscription is on the scroll over the priest's head, and a third round the face of the arches.

Quitting for the present the fertile and pleasing subject of village antiquities, we can only give a pleasing glance to one feature that is occasionally presented to our notice, that is the ancient canopy over the rustic churchyard gate, beneath whose cover the dead are brought for interment. There is a similar canopy at Beckenham, in the same country with Stone. They were called "lich-gates," "lich" signifying a "corpse."

B. M. WAUGH.

[We are much obliged to our correspondents whose letters are printed above, and also to several others who have kindly furnished the same information. We shall give an illustrated article on Stone Church in our next week's issue.—Ed.]

Moss Side Baptist Church and Organ have been renovated, at a cost of about £350.

New Schools at St. Helens.—The foundation stone of new British schools in course of erection in Knowsley Road, St. Helens, was laid recently by Colonel W. W. Pilkington, V.D., J.P. The cost of the building of the schools is estimated at about £1,500, and when completed accommodation will be found for 800 scholars, to be apportioned as follows:—250 girls, 250 infants, and 300 boys.

St. James's Church, Torpoint, has been presented by Colonel Pole-Carew, C.B., with a beautiful chalice and patten, designed by Mr. G. H. Fellowes Prynne, F.R.I.B.A. The base, which is beautifully worked and engraved, has on one panel a raised figure of Christ on the cross. It tapers gradually up to the stem, which is of open work. The stem is divided into two parts by a knob, also of open work, which is studded with precious stones. The cup is enriched in the lower part with rays emblematic of heavenly love. The patten is plain, but the two together form a very handsome ornament.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"*Without understanding genuine appreciation is impossible; without study, understanding is impossible.*"—SIR E. J. POYNTER.

Tate Gallery Extension. THE extension of the Tate Art Gallery is now rapidly approaching completion, and in about two months' time four of the new rooms will be open to the public. The new structure occupies an area slightly larger than the present gallery, and will contain nine picture galleries and one sculpture hall. The architectural features of the original building will, of course, be maintained in the additional block. It has not yet been finally decided what pictures shall have places in the new rooms, but it is pretty certain that the four rooms to be opened in two months' time will contain between thirty and forty of Sir Henry Tate's pictures, which are at present rather crowded together. Then there are half a dozen pictures purchased under the Chantrey bequest to be hung there after they have made a tour of the provinces, and it is also probable that many pictures—not portraits—painted by British artists during this century will be transferred there from the National Gallery. The new rooms being built represent the completion of the original scheme for the gallery, but the gallery, if it is to justify its title, as the National Gallery of British Art, will have to be extended in the near future. It is, therefore, time for the Government to secure sufficient land round it for this purpose. The Gallery, although out of the direct line of omnibuses, trams, and trains, has achieved a large amount of popularity; on an average 800 people visit the Gallery daily, and on students' day the attendance numbers 240. It is expected that the whole of the extension will be opened within the next six months.

The Forum Excavations. HUNDREDS of tons of earth have been removed from the site of the Basilica Æmilia, which is now almost entirely uncovered. In addition to the huge fragments of the inscription discovered last June, the bases of nine columns supporting the portico of the façade, have been brought to light, and the mosaic pavement of the interior has been cleared of the stones and rubbish with which it has been covered for the last thousand years. Part of the pavement had been destroyed in making a mediæval sewer, but part is in splendid preservation. As far as can yet be seen the front of the Basilica must have extended for at least 120ft., while its depth as far as hitherto excavated is about 80ft. Probably the original floor of the edifice ran back two or three times this distance, but for the moment houses and embankments bar the way to further excavations. The excavations along the Sacra Via are still giving good results, though they will have to be suspended for a while in order not to destroy the cart-road needed for carrying away the earth and rough stones removed from the other sites. The original mosaic pavement in the house of the Vestals has also been discovered. The ruins of this edifice were supposed to have been fully excavated some years ago by Professor Lanciani, but the discovery just made proves that the work was then done in an unscientific fashion, which left the most interesting part of the building still buried. The pavement lies some 3ft. below the level of what Professor Lanciani supposed to be the floor of the houses. A staircase built against one of the walls runs down to it. Part of the staircase was discovered by the former excavators, who, by simply following the steps downwards, might easily have come on the mosaic pavement. A similar pavement has also been discovered in a chamber of the house of the Vestals and another in the corner of the Domus Publica. Signor Boni has also discovered a portion of the massive and splendidly-built wall of the Domus Publica. In the Regia the remains of another altar and part of the mosaic pavement have also been discovered.

Signor Giocomo Boni. THE Italian Government have appointed Signor Giocomo Boni, Director of Archæological Excavations for the whole of Italy. Though the credit for having allowed the excavations at Rome to be carried on and for having provided most of the requisite funds belongs to Professor Guido Baccelli, Minister of Public Instruction, the actual scientific credit for all the discoveries made and for the admirable management of the excavations as a whole belongs to Signor Boni. Signor Boni is well known to British visitors to the Forum. He is a Venetian by birth, an architect by profession, a civil engineer by experience, and a poet by nature. One of the earliest pieces of work on which he was engaged was the restoration of the Doge's Palace in Venice, a task which he performed chiefly in accordance with the advice of Mr. Ruskin. He has since received a number of scientific commissions from the Ministry of Public Instruction, but none of such importance or interest to the world in general as that which placed him fifteen months ago in charge of the Forum. At first Signor Boni's instructions were to arrange the broken blocks and scattered fragments in the Forum, and considerable hostility is said to have been manifested by some of his superiors when it was known that he had ventured to make some minor excavations there. According to the wisdom of the archæological authorities fifteen months ago, the Forum had no need of being excavated, the work having been well and thoroughly done years back by Rosa, Lanciani, and others. Signor Boni, however, with the help of one or two faithful workmen, quietly began investigation. He came on the Rostrum of Julius Cæsar, then having found the true level of the Forum—a thing neglected by the former excavators — proceeded to discover the original Via Sacra and the Black Stone, with the ancient Latin inscription underneath, to delineate the real proportions of the Temple of Vesta, to discover the so-called Puteal Libonis, to find in the Regia a huge dry cistern used as a corn deposit, in which quantities of *stili* and Etruscan pottery were discovered, to discover the basis and a finely-decorated portion of the interior of the house of the Pontifex Maximus, and finally to complete the incomplete work of his predecessors by uncovering a series of mosaic pavements in the house of the Vestals. He has also carried out the gigantic excavations of the Basilica Æmilia.

Lincoln's Inn Gateway. THE Gate of Lincoln's Inn in Chancery Lane is now being restored, under the direction of Mr. Dennett H. Barry, surveyor to the Honourable Society of Lincoln's Inn. This is doubtless necessary and the restoration seems to be carried out in a proper spirit. The greater portion of the front of the Gateway consists of the work as actually laid during the years 1507-1518, when the gate was built; the typical small red brick of the Tudor period being varied with black vitrified bricks arranged in a lozenge pattern. Here and there, however, may be seen alterations in the original work, which date from the time when the British bond and Flemish bond were in use. Then, again, the brick of the top courses and parapet are of the larger size that came into use after the passing of the Brick Act, in the twenty-fourth year of George III., c. 24, which levied a duty of 2s. 6d. on every thousand bricks. It will be seen that the enlargement of the size of the bricks reduced the amount of duty payable, and their employment on the gate points to its repair at some date subsequent to the year 1784.

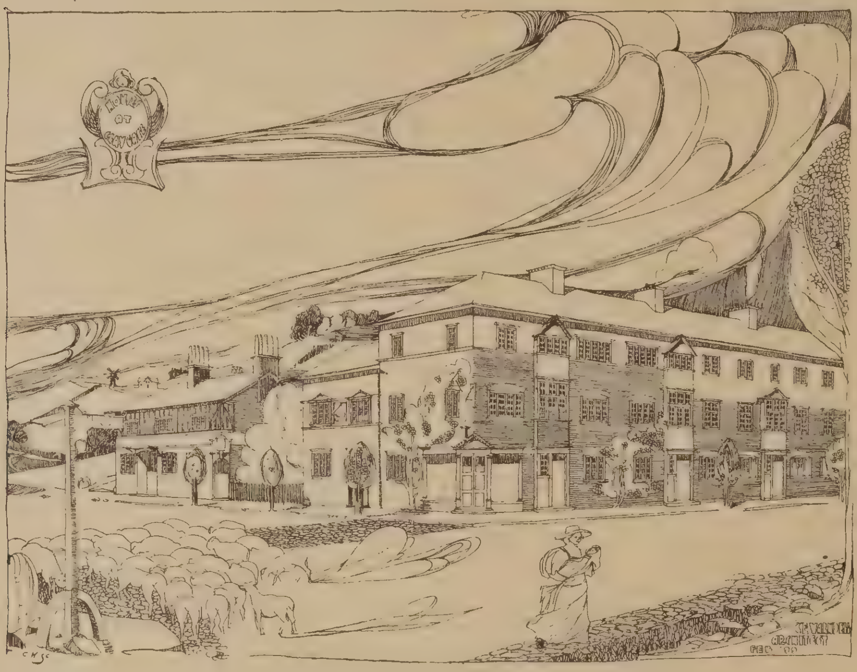
The Work to be Done. IT is this portion of the fabric, that which meets with most wear and tear from the elements, that is most in need of repair at the present time. About four feet of the stone coping and parapet walls of the towers facing Chancery Lane are to be removed and replaced with new material. The whole of the brickwork is to be re-pointed. It is to be hoped that this will not include scraping or washing over with the dirty red stuff very much in fashion nowadays. The whole of the brickwork is soaked with the grime of age, and an ancient relic gains nothing but loses much by putting on a mask of sham newness. It is to be regretted that all the windows of the Chancery Lane front have been modernised; in this we have a picturesque loss that is irremediable. In the court within the gate some lattices and mullions yet remain. The archway is obtusely pointed, with its original mouldings in good condition; within the archway destruction has been effected during some unrecorded "restoration." It was originally vaulted, but the vaulting has been removed, though traces of it remain. The timbers used in building the gatehouse were brought from Henley-on-Thames. The great oaken gates, which are closed to the public every night, are believed to be the originals first hung in 1564. These are to be thoroughly repaired. The postern gate on the north side of the arch is of recent construction. Above the gateway are a group of armorial bearings, sculptured in stone, and painted in gilt, after the fashion of the Tudor decorators, a fashion, in this instance, perpetuated to the present hour. In addition to the repairs of the fabric, the drainage and sanitary arrangements are to be entirely remodelled wherever this may be necessary.

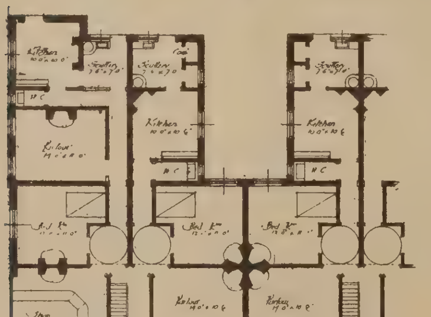
The Old Blue Coat School. THE Old Blue Coat School at the rear of the Hotel Windsor, Westminster, in what was formerly known as Palmer's Village, is now being extensively remodelled, with a view to being taken over by the existing school in Palmer's Street. The school was founded in 1688 by William Greene. Its old-fashioned windows have been replaced by others of modern design, but the statue of a Blue Coat boy over the doorway of the north front, and a painting of one of the scholars beneath the pediment on the south side, have been permitted to remain untouched. The schoolmaster's house adjoining, which was erected by public subscription in 1709, has, however, been replaced by a large and pretentious building. Our readers will remember that the school was recently sold to the local vestry on the condition that it should not be demolished until the expiration of twenty-five years.

Fire Tests with Floors. PUBLICATION No. 23 of the British Fire Prevention Committee has just made its appearance. It describes a test made on a floor by the Columbian Fire-proofing Company, of Pittsburgh, New York and London, on June 14th. The object of the test was to record the effect of a fire of two and a half hours' duration, commencing with a temperature of 500° Fahr., gradually increasing during the first thirty minutes to a temperature not exceeding 1,500° Fahr., increasing during the second and third half- hours to a temperature not exceeding 2,200° Fahr., and increasing during the fourth and fifth half-hours to a temperature not exceeding 2,500° Fahr., followed at the end of the two and a half hours by the application of a stream of water for three minutes, and the consequent rapid cooling. The area of the floor under investigation was 100ft. superficial in the clear (10ft. by 10ft.). The floor was loaded with 168lb. per foot distributed. The time allowed for construction and drying was two months and a half (Spring and Summer). The floor came out of the test practically unharmed, thus contributing most forcibly to the arguments in favour of concrete floors. The recorded effects of the test were: That the plaster on the underside of the ceiling and round the beams cracked slightly before the application of water; on the application of water some of the plaster fell off the soffit of the ceiling and beams; the concrete forming the floor was not damaged, that enclosing the beams was slightly damaged and cracked; the fire did not pass through the floor; and, the wood fillets bedded in the upper surface of the concrete were uninjured.

Professional Practice.

Bangor.—The new Presbyterian church at the corner of Prospect and Hamilton Road, was opened last week. The building is of large proportions, and the general arrangement of the plan is a departure from ordinary church architecture. A large open auditorium space, giving seating accommodation for a congregation of about 1,000, was secured for the site, and the arrangement of the plan to meet these requirements, led to a change from the ordinary rectangular form. The church itself is about 60ft. wide and about 80ft. long, the upper or pulpit end being 70ft. wide across the transepts, and rectangular in form. The remaining half of the church is polygonal in shape, thus giving a large amount of seating accommodation close around the pulpit. In order to avoid the structural necessity for columns the roof has been carried on steel girders in one span, and the galleries have been carried out on steel cantilevers, allowing of an uninterrupted view. At present the ground floor of the church has been completed, and the structural part only of the gallery put in, the flooring and seating for which can be fixed any time an extension of the accommodation of the church is required. A special feature externally of the building, when completed, will be the vestibule and tower. In order to save present outlay as much as possible, this vestibule and tower have been omitted, giving an unfinished appearance at present to the block of buildings. The church is carried out in a simple form of the perpendicular Gothic style. The material of which the building is composed externally is Scrabo stone shoddy dressings, with wrought window and other facings. The roof is covered with Bangor slates, and the apex of the roof is formed into a glazed dome, giving light through ceiling panelling to the whole of the centre of the church. Internally the woodwork has been finished in pitch pine, the large span of roof being panelled out with moulded ribs, and the pews and other woodwork are also finished in pitch pine. The pulpit will be of an elaborate character. It is executed in pitch pine and walnut. The platform floor of the pulpit is supported on an open row of columns with carved caps, and the balcony of the pulpit with Gothic arcading and small intermediate carved pillars. On either side of the pulpit there is a flight of steps and a large ornamental gas standard. At the back of the pulpit there is a high screen in pitch pine and walnut. A door in the centre of the screen opens into the minister's vestry at the rear. In front of the pulpit there are two area spaces, the first for communion table and the second for the choir, separated from each other by an open walnut railing. Above the pulpit is placed a stained glass window. The other windows are glazed with cathedral tinted lead lights. The heating is with the small pipe high-pressure system. The work has been carried out according to the plans and under the personal supervision of Mr. W. J. W. Roome, M.S.A., by the following:— Messrs. M'Laughlin and Harvey, builders; the structural steel work by Messrs. Richard Moreland and Sons, of London; the glazing of the windows by Messrs. James Campbell and Co.; the gasfitting by Messrs. James Baxter and Sons, York Lane; and the heating by Messrs. Crooks and Crozier.





HOUSES AT CLAYGATE. C. E. VARNDELL, ARCHITECT.

Claygate, Surrey.—The perspective and plan on this page illustrate part of some twenty houses about to be erected at Claygate, in Surrey, to meet the demand in the neighbourhood by working men for self-contained dwellings. They are to be built essentially as an investment, and while the outlay has been strictly limited, and the planning and fitting have been well considered, an attempt has been made to get an interesting elevation in contrast to the usual custom of repeating the design for the whole street. The walls would be built of a local red brick, the upper storey being either half-timbered or rough-casted, and roofed with green slates. The architect is Mr. Charles E. Varndell.

Paisley, N.B.—The Electric Lighting of Paisley was formally inaugurated last week. The system adopted is the high tension alternating in which current is generated at the works at a pressure of 2,000 volts, and carried to ten distributing stations placed at convenient centres throughout the area. At these stations the current is transformed to a pressure of 200 volts, at which it is distributed to the private consumer. The mains laid throughout the town are those of the Callendar concentric solid type, and extend to fifteen miles of cable. The area covered by the generating works at Blackhall is about two acres in extent, situated on the banks of the Cart, the water of which will be used for condensing purposes. Of a composite style of architecture, the station is built of the Cleghorn Terra-Cotta Company's first quality bricks, relieved by white stone dressings to windows, doors and cornices. It consists of two blocks, with an ornamental frontage to Blackhall Street. One block contains the engine room, boiler house, stores, workshops, &c., and the other the offices. Both are principally of a single storey. The engine room is 42ft. high to the ridge of the roof, and the boiler house about 44ft. The capacity of the machinery is sufficient for a demand equal to 12,000 eight-candle-power lamps. The Brighton scale of charges will be adopted. To the consumer the price will be 7d. per unit for the first hour's consumption, and 3d. per unit for every hour thereafter. The following is a list of the contractors engaged in the erection and equipment of the works:—Steam alternators, switchgear, rectifiers, rectifier switchgear—Messrs. S. Z. de Ferranti, Limited, Hollinwood, Oldham; boilers, Green's economiser, Vicar's mechanical stokers—Messrs. Babcox and Wilcox, Limited, Renfrew; pipework, crane, tank for condensing water—Messrs. Fullerton, Hodgart, and Barclay, Limited, Paisley; steel roofs, feed tanks, girder floors, crane gantry, &c.—Messrs. Hanna, Donald, and Wilson, Paisley; feed pumps—P. and W. M'Lellan, Ltd., Glasgow; stoker engine—Messrs. Bow, M'Lachlan and Co., Paisley; transformer chambers, transformers, and transformer chamber equipments—the Brush Electrical Engineering Company, Limited, London; mains—Messrs. Callender's Cable and Construction Company, Limited, London; brickwork, chimney, &c.—Mr. George Primrose, Paisley; mason work—Messrs. John Bryce and Co., Paisley; joiner work—Messrs. G. and T. Houston, Paisley; plaster work—Mr. Alexander Maxwell, Paisley; glazier work—Mr. G. G. Kirk, Paisley; plumber work—Mr. M. Allison, Paisley; painter work—Mr. David Bett, Paisley; tile and mosaic work—the Staffordshire Tileries Company, Glasgow; public lamp pillars—Messrs. Walter Macfarlane and Co., Glasgow; arc lamps for public lighting—The Brockie Bell Arc Lamp Company, Limited, London.

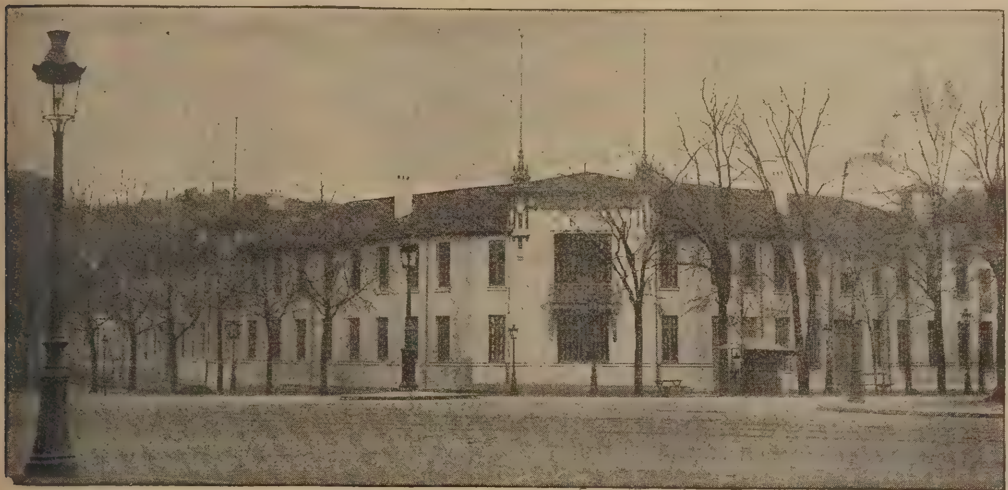
Westwood.—The new church at Westwood, in the parish of Selston, was consecrated last week by the Bishop of Derby. The church is cruciform in plan. The nave measures 61ft. by 31ft., in addition to south porch, and the chancel 31ft. by 16ft. 6in., besides the transepts, one of which will form the organ chamber and vestry. A tower and spire will be built later; for the present there is a small temporary turret to carry the bell, erected over the chancel arch. The bell weighs 1cwt. 27lb., and was cast by Messrs. John Taylor and Co., of Loughborough. Accommodation is provided for 356 worshippers. The style of building is Gothic of the perpendicular period, somewhat freely treated. The walls are of local bricks, faced with Leicestershire "sandstocks," with dressings of Matlock stone, and the roofs are covered with brown Staffordshire tiles. The internal fittings are of red deal, stained to a deep green shade, with the exception of the lectern, which is of pitch pine. This was made by Messrs. Jones and Willis, of Birmingham. The font is of red and white Hognaston stone, and was made by Mr. R. G. Lomas, of Derby. The building is warmed by hot water on the low pressure system. Mr. P. H. Cary, of Derby, was the architect, and Mr. Wm. Salt, of Ripley, the builder.

New Congregationsl Church at Blackpool.—The foundation stones of a new Congregational church were laid by Mr. Henry Fisher and Mr. Alderman T. H. Smith on Tuesday last week.

Trade and Craft.

THE "MACK" FIREPROOF SLABS.

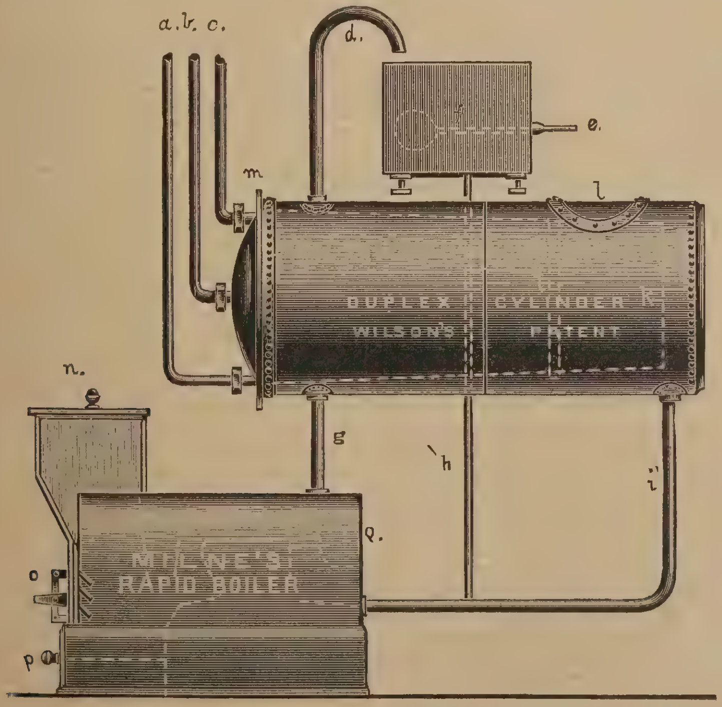
Below we give an exterior view of part of the large building that contains the administrative offices of the Paris Exhibition, 1900. It was the intention originally of the Parisian authorities to erect a wooden structure, but, in consequence of the disastrous fire at the Charity Bazaar, it was decided to make the building fireproof, and the "Mack" Patent Fireproof Plaster Slabs were used throughout for floors, partitions, and exterior walls. We understand that not only has the work given entire satisfaction, but also that it cost £1,000 less than the estimate for the wooden structure. The wall slabs are made with an asbestos backing, and are used instead of the ordinary mode of plastering walls. It is claimed that there is a great saving of time by this process of fireproofing. Another variety manufactured by the Mack Patent Fire and Sound Proof Slab Company is with tiles embedded in slabs, which can be cleanly and easily adapted to any house.



PALAIS DE L'ADMINISTRATION, PARIS EXHIBITION, 1900.

AN IMPROVED SYSTEM OF HOT WATER SUPPLY.

The apparatus illustrated herewith has been designed by Messrs. W. Wilson & Co., the well-known engineers, of 50, King Street, Manchester, and is arranged to give a most efficient supply of hot water for domestic purposes, viz., baths, lavatories, and sinks. It is also provided for heating coils and radiators. Yet the water in the two circulations does not mix. The water in the inner copper cylinder is heated by that in the outer iron cylinder, which is heated by the Milne's "Rapid" boiler. The domestic water never boils, therefore very little, if any, deposit takes place, and the water in the boiler and outer cylinder never changes, so that there is no deposit in the boiler or heating pipes. There is very little pressure on the boiler or cylinder, as the feed cistern is only a few feet above top of cylinder, consequently the heating mains can all be shut off in summer-time, and yet the boiler can be left with perfect safety, having an open-air pipe off the top of the cylinder. The boiler which Messrs. Wilson have decided to adopt in connection with their system, is the Milne's "Rapid" boiler, with patent smoke-consuming fire, designed by Mr. E. P. Milne, 15, Craven Street, London, W.C., which we described and illustrated in our issue of June 14th, 1899. The advantages resulting from this combined system are the absence of incrustation in pipes and boiler, the non-production of smoke, and the great economy in fuel from the burning of common slack coal in the smoke-consuming fire, which heats both circulations. We understand that the new laundry at the Wandsworth Technical Institute has been fitted with one of Milne's improved water-heaters, and a similar apparatus has recently been fixed in the Albion Hotel, Eastbourne.



AN IMPROVED SYSTEM OF HOT WATER SUPPLY

A Roman Pavement at Dorchester.—THE Roman tesselated floor at Dorchester has now been excavated. The design of the pavement is very elaborate, and, though considerable damage has been caused by the cutting of a drain through it before the discovery was made, a large proportion of the pavement is well preserved. The floor is considered to be that of a tablinum or other principal room, and the work was probably done late in the Roman era. The Dorchester Town Council are approaching the Dorset Museum and the Dorset Antiquarian Society with the view to joint action being taken for the acquisition of the relics, which at present belong to a private person, who is developing the land for building purposes. Dr. Colley March, the well-known antiquary, has inspected the floor on behalf of the British Museum, and it depends on his report whether a delegate from the Museum will examine the relics. A quantity of pottery and human remains have also been found.

CURRENT PRICES.

OILS AND PAINTS.

		£	s.	d.	£	s.	d.
Castor Oil, French ...	per cwt.	1	3	9	1	7	8
Colza Oil, English ...	per cwt.	1	4	3		—	
Copperas	per ton	2	0	0		—	
Lard Oil	per cwt.	1	9	0		—	
Linseed Oil	per cwt.	1	1	9	1	1	10½
Neatsfoot Oil	per gal.	0	2	6	0	4	0
Petroleum, American ...	per gal.	0	0	6 3/16		—	
Do., Russian ...	per gal.	0	0	5 5/8		—	
Pitch	per barrel	0	8	0	0	8	6
Tallow, Town	per cwt.	1	4	0	1	5	0
Tar, Stockholm	per barrel	1	5	6	1	6	0
Turpentine	per cwt.	1	15	4½		—	
Glue	per cwt.	1	14	0	2	18	
Lead, white, ground, carbonate	per cwt.	0	19	0		—	
Do. red	per cwt.	0	17	9		—	
Soda crystals	per ton	3	0	0		—	
Shellac, orange	per cwt.	3	4	0	3	5	
Pumice stone, ...	do.	0	8	9		—	

METALS.

		£	s.	d.	£	s.	d.
Copper, sheet, strong ...	per ton	88	0	0		—	
Iron, bar, Staffs. in London	do.	8	10	0	9	10	0
Do. Galvanised Corrugated sheet ...	do.	13	10	0		—	
Lead, pig, Spanish ...	do.	15	2	6	15	5	0
Do. do. English common brands	do.	15	8	9		—	
Do. sheet, English, 6lb. per sq.ft. and upwards	do.	16	10	0		—	
Do. pipe	do.	17	5	0		—	
Nails, cut clasp, 3in. to 6in.	do.	9	0	0	10	0	0
Do. floor brads	do.	8	15	0	9	15	0
Tin, Foreign	do.	147	10	0	148	0	0
Do. English ingots ...	do.	151	0	0	151	10	0
Zinc, sheets, English ...	do.	140	0	0	28	10	0
Do. do. Veille Montaigne	do.	30	0	0		—	
Do. Spelter	do.	23	7	6	23	15	0

TIMBER.

SOFT WOODS.

		£	s.	d.	£	s.	d.
Fir, Dantzic and Memel	per load.	3	0	0	4	0	0
Pine, Quebec Yellow ...	per load	4	7	6	6	5	0
Laths, log, Dantzic ...	per fath.	4	10	0	5	10	0
Do. Petersburg	do.	4	0	0	6	10	0
Deals, Archangel 2nd & 1st	per P. Std.	15	10	0	20	5	0
Do. do. 4th & 3rd.	do.	12	0	0	12	5	0
Do. do. unsorted	do.	12	5	0		—	
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	10	10	0	16	0	0
Do. do. 2nd ,,	do.	10	10	0	12	0	0
Do. do. Unsorted ,,	do.	8	10	0	10	15	0
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	per P. Std.	10	10	0	14	10	0
Do. White Sea	do.	13	0	0		—	
Do. Quebec Pine, 1st...	do.	20	0	0	23	15	0
Do. do. 2nd	do.	13	15	0	15	15	0
Do. do. 3rd &c.	do.	7	15	0	9	15	0
Do. Canadian Spruce, 1st	do.	9	0	0	10	5	0
Do. do. 3rd & 2nd	do.	6	5	0	7	15	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	7	5	0	8	5	0
Flooring Boards, 1 in. prepared, 1st	per square	0	10	0		—	
Do. 2nd...	do.	0	9	0		—	
Do 3rd &c.	do.	0	7	6		—	
Pitch Pine	per load	3	12	0	3	15	0

HARD WOODS.

		£	s.	d.	£	s.	d.
Ash, Quebec...	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey...	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba	per ft. sup.	0	0	4		—	
Do. Honduras	do.	0	0	3½		—	
Do. Tobasco	do.	0	0	2¼	0	0	3¾
Elm, Quebec	per load	4	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0	0			0	5¾
Do. African ...	do.	0	0	5 1 16		—	
Do. St. Domingo ...	do.	0	0	5 7/16	0	0	¾
Do. Tobasco ...	do.	0	0	5⅛		—	
Oak, Dantzic and Memel	per load	3	5	0	3	5	0
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks ...	do.	9	5	0	15	10	0
Wainscot, Riga (Baulk) ...	do.	8	15	0	5	15	0
Do. Odessa Crown...	do.	3	15	0	5	15	0
Walnut, American ...	per cub.ft.	0	2	6		4	0

Keystones.

A New Wesleyan Church at Ulverston is to be erected at a cost of £4,500. Fourteen memorial stones were laid recently.

New Police Buildings at Coventry were opened on Thursday. The buildings have been erected at a cost of nearly £14,000 by Mr. C. G. Hill from plans by Mr. H. Quick.

A New Higher Grade School is to be erected by the Greenock School Board at a cost of about £15,000. Mr. Bryden is the architect.

The Iron Bridge over the Traun, Gmunden, Austria, collapsed on Friday afternoon. Out of twenty persons who were endeavouring to strengthen it only one was saved.

The New Institute, Free Library, and Royal Museum at Canterbury was opened last week by the Mayor, Alderman George Collard. The bulk of the cost is covered by a bequest of £10,000 left to the City by the late Dr. Beaney, of Melbourne.

Brickworks Destroyed by Fire.—On Monday, last week, the works of the Quarry Hill Brick Company at Tonbridge, were entirely destroyed by fire. The outbreak occurred at five o'clock, and spread with such rapidity, owing to the materials of which the buildings were composed, that in an hour the whole of them, together with engines and machinery, were destroyed.

New Swimming Baths at Battersea.—Mr. John Burns, M.P., performed the ceremony of laying the foundation stone of the new public baths and washhouses which are being erected by the Battersea Vestry, near Battersea Park Station. The buildings, which are estimated to cost £35,000, will be in the English Renaissance style, and the accommodation is designed so that the large swimming-bath may be utilised as a public hall during the winter months.

A New Churchyard Cross at Farnham Royal has just been dedicated. The cross is 15ft. high, and is formed of massive blocks of Sicilian marble, each weighing several tons, and out from the central block the rising Saviour is seen leaving the tomb, coming forth with outstretched arms; the only words on the front, "Come unto Me," appear in bold raised letters on the plinth below, while high above all stands the ancient Celtic cross, very elaborately sculptured, and richly ornamented. The whole of the work has been designed and executed in the studios of Mr. E. J. Physick.

The Celtic Memorial Cross at Adare, which is at present on exhibition on the Dunraven estate, Adare, co. Limerick, is composed of carefully chosen limestone of remarkable whiteness and uniform colour from the Sheephouse Quarries, in County Louth. Elaborate carving covers the four sides of the cross, and partakes of different designs, a cable moulding which ornaments the angles being particularly fine. The base has also the angles cabled, and the front panel is remarkable for a deeply-recessed marble panel, surrounded with Celtic ornament, and bearing an inscription in imperishable lettering. The designing and superintendence of the work were entrusted to Mr. W. P. O'Neill, architect, of Lower Ormond Quay, and the contract was carried out by Mr. George Smith.

New St. Deiniol's Library at Hawarden.—The committee of the Gladstone Memorial Fund having allotted a sum of £10,000 for the erection of a permanent building at Hawarden to house the books now in the corrugated iron building erected by Mr. Gladstone, it has been arranged that the Duke of Westminster will lay the memorial stone on October 5th. The accommodation provides for the library itself a room, 30ft. by 45ft., with a gallery round, and at the north end of it a "divinity" room, 30ft. by 25ft. Leading from the latter is the warden's room, and there will be several studies beyond. The building will be Gothic in character, and faced externally with mottled Helsby stone. The architects are Messrs. Douglas and Minshull, of Chester.

A New Bank at Featherstone was opened last week for Messrs. Leatham, Tew and Company, in Station Lane.

New Sunday School at Worthing.—The memorial stones of the Sunday School in connection with the new Wesleyan church now in course of erection in Brighton Road, Worthing, were laid on Tuesday last week.

New Shambles for Arbroath. — The Arbroath Police Commission have approved of plans for the erection of new shambles in North Grimsby Street. The premises will be of an extensive description and thoroughly equipped.

The Crypt of St. George's Church, Southwark, is to be cleared of about 750 coffins by the Necropolis Company, for the churchwardens and overseers, at the following prices:—Per case of human remains, £1 13s. 8d.; per damaged or decayed coffin, £1 13s. 8d.; per coffin intact, £1 5s. 8d. Any antiquities that are found will be delivered to the parish surveyor.

Reopening of St. Andrew's Presbyterian Church, Nottingham.—St. Andrew's Presbyterian Church, Belgrave Square, Nottingham, which has been closed for the past six weeks for renovation, has just been reopened. The walls have been painted in two shades, with a Lincrusta Walton dado border, and the whole of the woodwork has been revarnished. A panelled screen has been fixed at each side of the organ and pulpit, designed to harmonise with the church fittings. The work has been carried out by Messrs. Marshall and Son and Messrs. J. H. Vickers, under the direction of Mr. J. Harris, architect.

COMING EVENTS.

Wednesday, September 20.

SANITARY INSTITUTE.—(Lectures for Sanitary Officers). —Mr. John Castell-Evans on "The Atmosphere." 8 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS INSTITUTION.—Ordinary meeting of the members. 8 p.m.

Thursday, September 21.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Congress at Blackpool until September 28th. Health Exhibition at Blackpool until October 14th.

Friday, September 22.

SANITARY INSTITUTE.—(Lectures for Sanitary Officers.) —Mr. John Castell-Evans an "Air and Ventilation." 8 p.m.

Saturday, September 23.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Sunderland.

Monday, September 25.

CITY OF LONDON COLLEGE (City Polytechnic).—Session opens.

NORTHAMPTON INSTITUTE (City Polytechnic).—Session opens.

Tuesday, September 26.

SOCIETY OF ENGINEERS.—Visit to the machine works of the Wick's Rotary Type-casting Company, and the works of the Bischof's White Lead Syndicate, at Hythe Road, Willesden Junction. 2 p.m.

Thursday, September 28.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Last day of Congress at Blackpool.

Monday, October 2.

WORSHIPFUL COMPANY OF CARPENTERS.—At the Carpenters' Hall, London Wall, E.C. Commencement of evening classes in building construction, drawing, and quantities. Architectural lectures at the King's College, London. Particulars can be obtained from the Secretary at the College, or from Mr. S. W. Preston at Carpenters' Hall.

Friday, October 6.

ARCHITECTURAL ASSOCIATION.—Annual general meeting. President's address and distribution of prizes. 7.30 p.m.

Monday, October 9.

WORSHIPFUL COMPANY OF CARPENTERS.—At the Carpenters' Hall, London Wall, E.C. Commencement of evening classes in architectural and constructional drawing, quantities, surveying, &c., and lectures on architectural construction at the University College. Particulars can be obtained from the Secretary at the College, or from Mr. S. W. Preston at Carpenters' Hall.

Wednesday, October 11.

SOCIETY OF ARCHITECTS.—Examination in architecture and building construction, &c., at St. James's Hall, Piccadilly, W. (First day).

Thursday, October 12

SOCIETY OF ARCHITECTS.—Examination in architecture and building construction, &c., at St. James's Hall, Piccadilly, W. (Second day).

Friday, October 13.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Debate on "The Registration of Architects," opened by Messrs. A. R. Jemmett and G. A. T. Middleton. 7 p.m.

SOCIETY OF ARCHITECTS.—Examination in architecture and building construction, &c., at St. James's Hall, Piccadilly, W. (Last day).

Saturday, October 14.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Last day of Health Exhibition at Blackpool.

New Companies.

Hockett and Company, Limited.

This company was registered on Aug. 31st, by Messrs. Judge and Priestly, 4, Broad Street Buildings, E.C., with a capital of £1,000 in £1 shares, to carry on the business of cartage contractors and carmen. Registered without articles of association. Registered office: 93, Tabernacle Street, Finsbury.

Messrs. Watts, Powell and Cook, Limited.

This company was registered on Sept. 5, by Mr. E. Horder, 9, Station Road, Finsbury Park, N., with a capital of £5,000 in £1 shares, to carry on the business of builders, merchants, contractors, &c. The first directors (to number not less than three nor more than six) are Messrs. M. G. Horder (chairman), W. C. Watts, A. Powell, Charles F. Cook, and Ernest N. Butler. Qualification, £100. Registered office: 110, Fenchurch Street, E.C.

Brighouse Stonecutting and General Contracting Company, Limited.

This company was registered on September 1st, by Mr. F. Hatton, 150, Strand, W.C., with a capital of £2,000 in £1 shares, to acquire and take over, as a going concern, the business carried on by Mr. Frank Crowther, at 36a, Rastrick Common, Rastrick, Yorkshire, and to carry on the business of stone merchants, stonecutters, stone carvers, monumental masons, quarrymen, and general contractors.

London and Arlesey Brick Company, Limited.

This company was registered September 1st, by Messrs. Waterlow Brothers and Layton, Limited, Birchin Lane, E.C., with a capital of £12,000 in £1 shares, to carry on at Arlesey, in the parish of Langford, in the county of Bedford, and elsewhere, the business of brick, pipe, tile, terra-cotta, and sanitary and general tube manufacturers; to adopt an agreement with Messrs. William Child and Henry Child, for the acquisition of a piece of land at Langford. The first directors (to number not less than three nor more than six) are Messrs. William Child, Henry Child, Alfred R. Blakeley, and James W. Close. Qualification, £1,000. Remuneration as fixed by the company.

Tararu Creek Gold Mining Company, Limited.

This company was registered on August 31 by Messrs. Greenip and Company, 1 and 2, George Street, E.C., with a capital of £95,000 in 10s. shares, to acquire certain mines, mining rights, &c., in the Hauraki districts of New Zealand, upon the terms of an agreement expressed to be made between a company with a similar title, in liquidation, and the liquidator thereof of the one part and A. J. Lavington, as trustee for and on behalf of this company of the other part; to seek and secure openings for the employment of capital; to acquire any other mines, mining rights, alluvial ground &c., in any part of the world, and to carry on the business of a mining and trading company in all its branches; to lay out towns and villages, &c.; as builders and contractors, &c. to erect or maintain smelting or other works &c., to negotiate loans, &c.; as mechanica engineers, &c.; to build factories, mills, &c. to deal in live and dead stock, &c.; to acquire steam and other ships, &c.; to insure with any other company or persons against losses and liabilities of all kinds; and also to carry on on its own account the businesses of marin insurance and marine accident insuranc in all their respective branches, &c. Th signatories (each one share) are Messrs H. Wilson, G. H. Stayton, G. D. Ingal D. Alten, E. H. R. Trenow, R. F. H. Webb and J. A. Travers. The first director (of whom there shall be not more tha five nor less than two) are Messrs. I Allen, C. Clark, J. H. Stayton, J. A. Traver and H. Wilson. Qualification, £500. R muneration: Chairman, £125, ordinary dire tors, £100 per annum each.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

AMBERLEY (Sussex).—For the erection of a block of cottages, for Messrs. Pepper and Son. Mr. H. Howard, architect, Town Offices, Littlehampton :—

Snewin Bros.	£1,751
W. Wallis	1,747
Linfield & Son	£1,710

[All of Littlehampton.]

BELFAST.—Accepted for the execution of sewerage works, &c., Balmoral District, for the Corporation. Mr. J. C. Bretland, City Surveyor, Town Hall, Belfast. Quantities by Mr. Acheson Ferguson, Wellington-place, Belfast:—

W. H. Campbell, Belfast	£4,791

BELFAST.—For laying water-main, Knockbracken, 1st Section, Contract No. 27, for the Water Commissioners. Mr. L. L. Macassey, C.E., Westminster and Belfast. Quantities by Mr. Acheson Ferguson, Belfast :—

J. and W. Stewart	£10,242 0 0
Patterson and Co., Ltd.	8,392 13 5
Fisher and Lefanu	7,529 2 6
T. McMurray	£5,859 0 0
Lanerty and Sons	5,585 16 0
H. and J. Martin, Ltd., Belfast*	4,053 0 0
J. Hemingway	2,725 0 0

* Accepted.

BELFAST.—For the construction of two reservoirs, Old Park, for the Water Commissioners. Mr. L. L. Macassey, C.E., Westminster and Belfast. Quantities by Mr. Acheson Ferguson, Belfast :—

Paterson and Son	£19,914 16 6
J. and W. Stewart	15,456 0 0
T. McMurray	14,686 0 0
J. Hemingway	14,370 0 0
Lanerty and Sons	14,000 0 9
Fisher and Lefanu	£13,397 13 10
H, and J. Martin, Ltd.	12,590 0 0
Courtney and Co., Belfast*	11,998 0 0

* Accepted.

BERWICK-UPON-TWEED.—For the erection of printing-rooms, &c., High-street, for Mr. H. R. Smail. Mr. J. L. Miller, architect, 39, Hide-hill, Berwick-upon-Tweed :—

Masonry.

Gray and Son, Berwick-upon-Tweed*	£720
James Russell	£718
H. Elliott and Son	710

Joinery.

Henderson Bros.	£345 0
A. C. Burn	345 0
John Ord	338 0
Charles Mace, Berwick-upon-Tweed*	£330 14

Slating and Plastering.

A. Sidey	£140 10 0
Turner and Son	132 8 5
Thos. Renwick	120 0 0
T. Tule and Son, Tweedmouth*	£100 0

Plumbing.

Geo. Macadam	£103

Gasfitting, &c.

John Percy	£101 5 0
D. A. Lamb	99 10 0
George Smith	97 14 6
R. W. Sidey	95 0 0
Wilson and Son, Berwick-upon-Tweed*	£94 0 0

All Trades.

Cockburn and Son	£1,265

[Architect's estimate, £1,252. Mason work includes provisional sum for heating and ventilating.]

* Accepted.

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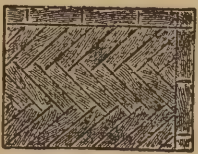
London Office: 64, FINSBURY PAVEMENT, E.C.
Quarries: PETERHEAD, N.B.



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17¼×3×1½	6 9	6 1	9 1

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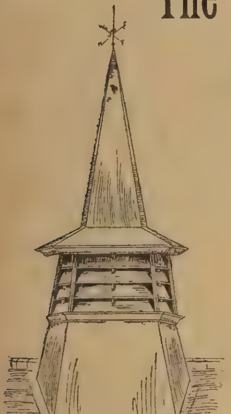

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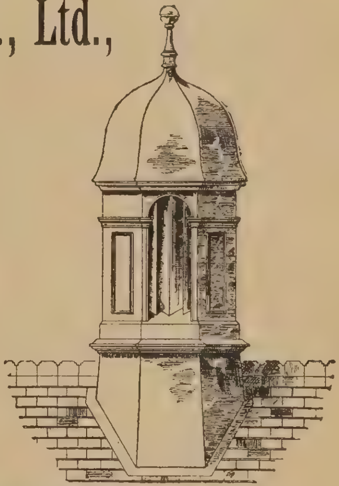

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MEDAL FOR THE "RAPID" SLOP WATER CLOSET.
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BURY (Lancs).—For additions to Egyptian Mills, Elton, for Mr. E. Milnes. Mr. C. H. Openshaw, architect, Fleet-street, Bury. Quantities by architect:—

Chas. Brierley	£1,400 0	Samuel Clough	£1,240 0
Chas. Lomax	1,400 0	Jas. Byron	1,239 0
John Inman	1,370 0	Bury Saw Mill Co.	1,230 0
John Hall	1,350 0	J. Fletcher, Bury*	1,190 0
Thompson and Brierley	1,300 0	John Tinline	1,175 0
Thos. Newhouse	1,270 0	Smith Bros.	1,173 19

* Accepted.

COLDSTREAM (N.B.).—Accepted for additions to North School, for the School Board. Mr. George Duns, architect, Duns, N.B. Quantities by Mr. Jas. D. Gibson, surveyor, Edinburgh:—

Building.—Adam Smeaton, Greenlaw	£925	0	0
Joinery.—J. and A. Gray, Coldstream	820	0	0
Plastering.—John Whitehead, Duns	86	0	0
Plumbing.—A. Ford, Coldstream	187	15	0
Slating.—Robert Rule, Coldstream	122	0	3
Painting.—A. Hogarth, Coldstream	51	17	3

DARWEN (Lancs.)—For the extension of stables, Wood-street, for the Industrial Co-operative Society, Limited. Mr. J. B. Thornley, architect, 45, Market-street, Darwen. Quantities by the architect:—

T. Orrell	£2,190 0	Lloyd and Millward	£1,627 0
T. Lightbown	1,900 0	Whalley and Co.	1,568 6
Lord, Heaton, and Marsden	1,896 0	R. Shorrock, Union-street, Darwen*	1,550 0
John Knowles	1,775 6		

* Accepted.

HERTFORD.—For erecting a new factory at Hertford for Messrs. Gilbertson and Page. Mr. James Farley, architect, Hertford:—

S. Redhouse	£3,490	Guin and Son	£3,175
Merridew and Wort	3,386	Lawrence and Son, Waltham Abbey*	3,049
E. R. Kemp	3,265		
Norris and Son	3,254		

* Accepted.

DEVONPORT.—For erection of three shops and twenty-four flats for housing the working classes, for the Corporation of Devonport. Mr. J. F. Burns, Borough Surveyor, architect. Quantities by Messrs. Corderoy, Selby, and Corderoy:—

T. King	£11,375	Wakeham Bros.	£8,354
Jenkin and Son	8,990	Goad and Co.	8.297
J. Cockerell	8,960	A. R. Lethbridge and Son	7,998
F. May	8,628	S. Roberts	7,794
A. N. Coles	8,500		

LONDON, W.—For works in re-decorations at No. 45, Warrington Crescent, Maida Vale, W., for Mr. Nathanial Abrahams. Messrs. Clark and Hutchinson, architects, 28, John-street, Bedford-row, W.C.:—

A. V. Paddison	£343	F. T. Brunton and Son	£260
Hayward and Son	315		

LONDON, E.—For alterations and repairs to the "Freemasons' Arms" public-house, Salmon-lane, Limehouse, E., for Mr. Wm. Dean. Mr. J. G. Needham, architect, 18, Lower Clapton-road, N.E.:—

G. E. Todd and Co., Hackney-road	£4,965	0	0
L. H. Jackson, Poplar	4,619	0	0
Ashby and Son, Union-court, E.C.	4,484	0	0
H. Cocks and Co., Bow	4,250	0	0
J. W. Maddison, Canning Town	3,900	0	0

Gasfitting.			
Jas. Steadman, Bethnal Green	£281	10	6
Pewtering.			
R. Pringle, Brick-lane	£119	10	0
G. Rogers, Commercial-road	100	0	0
Seating, &c.			
Platt and Son, Curtain-road	68	17	6

LOWESTOFT.—For the erection of schools, Oulton. F. W. Richards, architect, Stanley-street, Lowestoft. Quantities by architect:—

Youngs	£2,285 0 0	Barham and Swan	£1,758 0 9
J. P. Smith	2,177 0 0	J. Beckett	1,664 15 0
Ashby	2,135 0 0	W. Scarle, Carlton Colville*	1,525 10 0
Atterton and Earle	1,900 0 0	Kemp & Turner	1,430 11 6
Chapman and Son	1,850 0 0		
R. C. Cole	1,784 0 0		

* Accepted.

MANCHESTER.—For the rebuilding of shop premises in King-street, Manchester, in the occupation of Messrs. Goodall, Lamb and Heighway, Ltd., for Mr. R. R. Rothwell. Messrs. Maxwell and Tuke, architects, 41, Corporation-street, Manchester:—

John Ramsbottom	£10,970	Wm. Brown and Son	£9,977
Wm. Southern and Sons	10,878	R. Neill and Son	9,510
Henry Vickers	10,200	John Bland	9,450
		W. A. Peters and Sons, Rochdale*	9,047

* Accepted.

NEWMARKET.—For erecting twenty-eight houses in Nat. Flatman-street, Newmarket. Mr. Jno. Flatman, architect:—

Kerridge and Shaw	£8,364	Linzell	£6,377
Bly Bros.	6,868	W. P. King	6,318
R. Hunt	6,812	Cowell*	5,976

* Accepted.

PENMAENMAWR (North Wales).—For the execution of sewage works, Capelulo, for the Urban District Council. Mr. Ernest Worrall, surveyor, Council Offices, Penmaenmawr. Quantities by surveyor:—

Sheffield and Thomas	£3,848	Morney and Co., Manchester*	£3,536
F. D. Chantrey	3,725	Hughes and Rowlands	3,510
Underwood Bros.	3,713	Thomas and Jones†	2,907

*Accepted. †Incomplete.

SOUTHEND-ON-SEA.—For addition of girls' school to Leigh-road Schools, for the Southend-on-Sea School Board. Mr. W. Y. Hobbis, architect. Quantities supplied:—

F. and E. Davey	£5,679	Davis and Leaney	£5,067
A. E. Symes	5,490	Dupont, Southend-on-Sea and Colchester*	4,999
Shelborne and Co.	5,420		

* Accepted.

STRATFORD.—For building three tenement houses, Aldworth-street, West Ham-lane, Stratford, for Mr. C. A. Day. Mr. J. G. Needham, architect, 18, Lower Clapton-road, N.E.:—

Taylor Bros.	£1,550	A. Webb	£1,278
J. W. Maddison	1,490	E. Jenner, Wanstead	990
Thos. Emmett	1,350		

SWINDON.—For alterations and new premises, Devizes-road, Swindon, for Messrs. Chandler Bros. Mr. W. H. Read, architect, Swindon:—

C. Williams	£1,857 10 0	Liddington	£1,720 0 0
Flewelling and Huckson	1,847 0 0	A. J. Colborne*	1,550 8 5
J. Williams	1,777 0 0	Crook	1,206 0 0

* Accepted.

WOKING.—For additions to "Robin Hood" inn, Goldsworth. Mr. W. G. Lower, architect, 12A, High-street, Guildford:—

Sims and Woods	£2,044 9 8	S. Ellis	£1,494 0 0
F. Milton	1,780 0 0	J. Gosden, Woking*	1,448 0 0
F. W. Reavell	1,600 0 0		

ELGIN, N.B.—Accepted for the erection of residence, Mayor-road, Elgin, N.B. Robert B. Pratt, architect and surveyor, County Bank House, Elgin:—

Mason.—James Young	£550	0	0
Carpenter.—A. and R. Dunbar	333	0	0
Plumber.—J. Hunter Clark	167	17	0
Slater.—James Wilson	67	10	0
Plasterer.—George Gray	94	18	0
Painter.—Wm. Fordyce	41	5	0
	£1,254	10	0

CONTRACTS OPEN.

CENTRAL LONDON SICK ASYLUM DISTRICT.

CONTRACTS FOR WINDOW BLINDS.

The Board of Management for the above district hereby invite TENDERS for the SUPPLY of WINDOW BLINDS for their new asylum at Hendon.

Printed forms of Tender, and such only, will be received containing the nature and conditions of the contract to be entered into, and the estimated amount of the articles required may be obtained from SEPTEMBER 15th to SEPTEMBER 22nd inclusive, by forwarding to the Clerk a stamped addressed envelope of foolscap size.

Sealed Tenders, addressed to the Board of Management, must be delivered not later than 10 a.m. on MONDAY, SEPTEMBER 25th, 1899, and will be opened at a meeting of the said Board at 4 p.m. on the same day.

The Board of Management do not bind themselves to accept the lowest or any Tender.

By order,
FRED W. BAILEY,
Clerk to the Managers.

Clerk's Office,
Cleveland-street Asylum,
London, W.,
September 13th, 1899.

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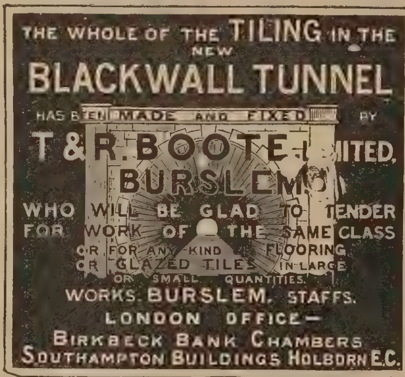

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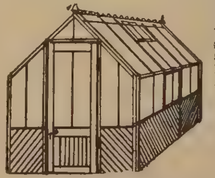

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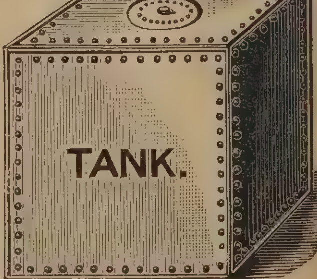

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THE SANITARY INSTITUTE.

ANNUAL CONGRESS.

[BY OUR SPECIAL CORRESPONDENT.]

(Continued from page xliv., No. CCXL.)

ON Wednesday, August 30th, the congress resumed work, divided into eight sections. The municipal representatives met in the Town Hall, under the presidency of Mr. Alderman Thomas Walton, J.P., the chairman of the Health Committee of the Southampton Corporation, who dealt in detail with the methods adopted in Southampton to bring about an efficient system of sanitation. Two papers then followed on the

Housing of the Working Classes,

by Mr. Thomas Blashill, late architect to the L.C.C., and by Mr. C. J. Hair, A.R.I.B.A. Mr. T. Blashill declared that re-housing people from insanitary areas was the most formidable obstacle to be encountered. The cost in London was nearly £55 per head. The problem was how to avoid the enormous outlay. He expounded a new scheme, which would destroy only the slums, leave every owner the true value of his interest, and eventually rehouse or resettle every person dispossessed, without greatly encumbering the rates. His plan, in the case of a private owner of slum property, would be to compel him to rebuild his properties at his own cost, the local authority superintending the rehousing. Where there were several owners in a condemned area, the freeholders should be directed to form a trust for the improvement of their property, and be empowered to acquire leasehold interests at fair market value. No new inhabitant should be permitted to settle in such an area. The local authority would superintend resettlement, the families in the area would all be scheduled, and their position investigated. It would then be seen who were fit for rehousing on the site close by, or elsewhere. Some might have to be compensated for loss of business, but this idea was not very cordially received. Mr. Hair's paper was published in full in our last week's issue.

Dr. Charles Porter, of Stockport, read a paper on

Common Lodging-Houses.

The points to which he chiefly directed attention were :—(1) The necessity for *annual* registration ; (2) for increasing the minimum allowance of air-space per sleeper ; (3) the adequate provision of sanitary conveniences. With regard to the necessity for annual registration, he pointed out that under the existing general law, the rule is "once a registered lodging-house, always a registered lodging-house," unless the licensee has, *as such*, been three times convicted of an offence against the Public Health Act, or unless the Health Officer can obtain closure by certifying, under the Housing of the Working Classes Act, 1890, that the house is unfit for human habitation. Now, quite obviously, a house which is not unfit for human habitation may be quite unfit for a common lodging-house, and one reason why Parliament was successfully asked in Section 101 of the Stockport Corporation Bill, 1899, for power to require annual registration of these houses, is in order to be able to deal eventually with the unsuitable places at present registered.

Allowance of Air-space per Sleeper.

In former years, 250 cubic feet was regarded as a reasonable allowance, but from recent inquiry in most of the large towns it appears that 300 cubic feet is at present the usual allowance, and this is the figure suggested in the Local Government Board's memorandum of July, 1877. This standard has, however, been determined more with a view to difficulties of lodgment in large towns, and the minimum of space that can be occupied by a sleeper and his bed, than with any regard to physiological requirements, and when it is remembered that in a room of 1,000 cubic feet occupied by one man, the air must be changed three times per hour in order to keep it within the so-called "permissible limit of respiratory impurity," it will not be unreasonable to ask for a minimum allowance of 400 cubic feet per sleeper, especially by any who have visited such sleeping rooms in the small hours. This standard has been voluntarily adopted in many of the most financially successful modern lodging-houses, and in Stockport, the Sanitary Committee have decided to insist upon it. In addition, attention should of course be paid to the existence and efficiency of methods of ventilation in each case.

Sanitary Accommodation.

Section 87, of the Stockport Act of 1899, empowers the Corporation, on the report of their medical officer of health, or surveyor, to require the provision of sufficient and suitable sanitary conveniences, and as in factories and workshops with proper separate accommodation for the sexes. Having regard to the existing conditions in these respects in the average common lodging-house, there can be no question as to the importance of these provisions. In connection with common lodging-houses, Dr. Porter had found slop-water closets specially suitable.

In the Port Sanitary Authorities section, Mr. Millar Wilkinson, chairman of the Port of London Sanitary Authority, presided, and spoke on the question of sanitation in the mechantile marine. Dr. E. W. Hope, medical officer at Liverpool, spoke on the desirability of vaccination stations at seaports. Dr. H. Williams, of London, contributed a paper on the precautions which should be taken against the introduction of small-pox on passenger ships. Miss E. Bell spoke on "The Sanitation of Passenger Ships."

Dr. T. Orme Dudfield presided over the conference of Medical Officers of Health, where a discussion, introduced by Dr. Arthur Newsholm, took place, on "The Prevention of Phthisis."

In the absence of Dr. C. E. Shelley, Dr. T. W. Reid presided over the Conference of Medical Officers of Schools. —Mr. E. Purnell Hooley, County Surveyor of Nottingham, and a member of the Council of the Association of Municipal and County Engineers, presided in the municipal engineering section, held in the Art Gallery of the Hartley College. The principal feature of Mr. Hooley's address was an unsparing condemnation of the action of small councils who pass over

Professional Men

of recognised status for a "local man, the son of a builder, a broken-down farmer, or even a member of the Council," when appointing a surveyor; also of contractors who had carried out work which had been corrected, and subsequently obtained seats on the councils for the sole purpose of venting their spleen and endeavouring to upset the officials who had been the innocent cause of the trouble. The remedies he suggested were that the Local Government Board should accept the surveyor on the same footing as the medical officer of health and inspector of nuisances, and so prevent his being dismissed at the caprice of those over him without any court of appeal, and then, with superannuation in front and security of office at hand, his lot would be happier, his worries less frequent, and his mind freer to combat with his duties.—The Sanitary Inspectors' Section met under the presidency of Mr. Charles MacMahon. The subject of Mr. MacMahon's address was

"Hindrances to Sanitary Efficiency,"

among which he enumerated insecurity of tenure, which prevented inspectors carrying out their various and disagreeable duties to the highest point of efficiency, and the want of superannuation. It appeared as if the remedy for the hindrance mentioned was in sanitary officers being constituted Government officials, and responsible to a new department of State, with a Cabinet Minister at its head.—Mr. H. H. Spears, chief sanitary inspector of West Bromwich, followed with a paper, "Considerations by the way : A Plea for the Nationalisation of Health." He suggested that the administration of the Public Health Act should be taken out of the hands of the local authorities altogether, and be vested in the State. A Ministry of Public Health would be the natural outcome of any naturalisation scheme. The various provisions of the Public Health Act would be executed without fear or favour by qualified men giving their whole time and attention to their duties. They would have jurisdiction over districts whose areas would not necessarily be coterminous with those of a local authority, they would be unfettered and independent, and removed from the sinister influences incident to local control, and have powers to take immediate steps for the abatement of deleterious conditions.

In the Ladies' Section,

presided over by Mrs. Constance Patey, Mrs. H. Percy Boulnois read a paper on the hygienic aspects of occupations suitable for women, Miss Rosetta E. Gardiner read a paper on the work of a health visitor, Lady Harberton on the hygiene of dress, Miss Isabel G. Smith on the infant mortality, and Miss B. Hall on the practical teaching of hygiene in schools. The Hon. Mrs. A. T. Littleton and Mrs. Richard Andrews also dealt with the necessity for a universal teaching and practice of hygiene.

About 100 delegates drove to Southampton Waterworks at Otterbourne in the afternoon, and the same number went to the Portswood sewage farm. The isolation hospital, now in course of completion, was also visited, and in the evening the Mayor gave a conversazione on the Royal Pier.

On Thursday meetings were held in three sections, for (1) sanitary science and preventive medicine, (2) engineering and architecture, and (3) physics, chemistry, and biology. There was also a section for ladies, and the conference of sanitary inspectors was continued. Alderman Sir Joseph Ewart presided over Section 1, and his opening address was followed by a paper on "The Recrudescence of Plague in the East and its Relation to Europe," by Professor W. J. Simpson. Mr. James Lemon, F.R.I.B.A., past president of the Association of Municipal and County Engineers, presided over Section 2, devoted to architecture and engineering. He said, in opening his address, that as engineering and architecture covered such a large field, he could not in a brief address do full justice to these subjects ; he could only refer to those branches of thought and practice which more particularly refer to the maintenance of the public health.

Pure Water.

The supply of pure water to our towns and villages claimed the first attention of sanitarians, as it was a necessity of life, and without it various diseases were generated. The question as to a constant versus an intermittent supply, had been fought and won, and although in some towns and districts the water supply was intermittent, the almost universal opinion was in favour of the constant system. There was no difficulty in this country in obtaining a sufficient supply of water, but the raising of the standard of purity and increase of population had led to a scramble for a better source. How far this race from one part of the kingdom to the other, on the part of the wealthy corporations, should be permitted, was a matter for serious consideration by Parliament. It might be desirous to allocate the areas of supply to certain districts, so that it might not become a question of "first come first served," and the longest purse. The charges for baths and extra water closets were taxes upon the public health, and should be prevented by Act of Parliament. If the statutory rate was not sufficient to include these charges, the rate should be increased accordingly. As to the sources of water supply, he believed we should see great changes in the near future; Maidstone had taught us a useful lesson, and rivers were no longer considered safe and reliable. They must either be largely supplemented, or a fresh supply obtained from a new and independent source.

Sewerage.

The chief points to be observed in the designing of town sewerage schemes were a constant flow, so as to ensure self-cleansing, water-tight sewers, and adequate means for inspection. The improvement in our water supply, and the more general supply of baths had materially assisted the first point, and we now seldom saw a modern pipe sewer designed by a competent engineer without the proper velocity. There was also a marked improvement in the last few years in sewer construction, more attention being now given to the jointing. Iron pipes, and patent joints to stoneware pipes were more generally used in water-logged and damp soils. The iron pipe had a great advantage over stoneware, as it was made in 9ft. and 12ft. lengths, consequently there were fewer joints. It could also be jointed to stand pressure, and with a head of water upon it was, in his judgment, the only reliable material. These remarks as to sewers also applied to house drains; if we wanted a thoroughly water-tight drain, we should use iron pipes; the cost was not much more per house, and the result as regards efficiency could not be too highly estimated. The testing of sewers and drains, and the enforcement of regulations as to water-tight joints, had led up to better gradients and smaller sewers. Local authorities did not now look upon a pump with fear and abhorrence, as they knew within reasonable limits what the annual cost would be. They also knew that the pollution of rivers and streams would not be tolerated, and that some form of sewage disposal must be adopted. In order to do this effectually and economically, the flow at the outfall must be reduced as much as practicable. These were all steps in the progress of sanitary science; one step led to another, and as we travelled upward, the death rate went down in corresponding ratio.

Sewage Disposal.

The sewage question, like the poor, was always with us. It had been solved by every sanguine inventor who had taken out a patent during the last thirty years; but it was not solved yet. However, the merits of each particular mode of treatment had become recognised, and experts were, in most cases, willing to admit there was a place for all, and that the particular mode of disposal must be governed by local circumstances. There had been a great waste of money by local authorities and public companies in the treatment of sewage. Sewage was a thing to be got rid of at the least cost without nuisance. Large quantities of crude sewage had been poured on to heavy clay lands, and the effluent from tanks, after chemical precipitation, had been discharged into small streams. Failure had resulted, and reconstruction had become necessary. Bacterial filter-beds had now come to the front, and valuable information had been afforded. The principles laid down by the Local Government Board were sound—viz.: Rainfall and sewage to be calculated at three times the dry weather flow; above three times and up to six times to be treated on storm-water filters; above six times the storm water may be discharged into a stream or on to prepared land; the capacity of the filters to be taken at one-third for the fluid and two-thirds for the filtering material; a cycle of eight hours for filling, emptying, and rest for æration. But when they asked that the filtered effluent, after double filtration through coarse and fine filters, should be pumped on to land suitable or unsuitable, then he parted company with them. This policy of the Local Government Board was stopping the use of these bacterial filters, as they refused to grant a loan for their construction unless this land irrigation were adopted.

Pure Air.—We examined our water supply, and we knew by analysis, and by bacteriological observations, whether it was fit for consumption or not, but he was afraid we knew very little of the air which we breathed. Sanitary engineers were agreed that the drainage of w.c.'s, sinks, lavatories, and baths should be disconnected from the house, and ventilated; but there was a difference of opinion as to the merits of the "drain interceptor." If it were abolished every house-drain would ventilate the sewer. The ventilation of sewers was one of those questions upon which a great deal had been said and written, but not much progress made. In most towns there was some kind of ventilation. It was, in his judgment, desirable that the air in sewers should be in connection with the external air by openings in all desirable points. The air in the sewer was displaced by the increase in volume of the sewage, and if openings were not made for its exit, it would find its way out at places where least desired. There was a great deal to be said in favour of open gratings in the centre of the streets, but they were liable to be closed by the near householder or the local authority, and therefore were not reliable. He had come to the conclusion that properly designed shafts should be provided, so that the air in the sewer might be changed as frequently as possible; some of these shafts would be inlets and some outlets, but in any case a diffusion of the sewer air would take place. There was not, however, that necessity for sewer ventilation now, which there was in the earlier days of sewer construction, sewers were now better designed, had better gradients, were laid more accurately, and were better flushed; consequently there was less deposit of fæcal matter, less decomposition, and less generation of noxious gases.

Healthy Dwellings.

One of the first considerations was the adoption of a dry sub-soil. In crowded towns this could not always be obtained; vacant spaces were swallowed up by the "jerry builder," and as many houses as possible crowded upon a given area; but the local authority could make by-laws to minimise the evil. They could stipulate that the entire area of the house should be covered with concrete. That the sub-soil be drained, and that the space under the floor be ventilated. In most by-laws the local authority had adopted 150ft. super as the air space. It could be increased with advantage to the public health. The height of rooms was fixed at 8ft. as a minimum, but there should be some regulation as to the minimum area. If the cubic capacity given in the model by-laws, viz., 400ft. per adult, were adopted, then a room could not be less than 100ft. area for two persons. This was too small, as it only gave a room 10ft. by 10ft. Under Section 91 of the Public Health Act, "Any house or part of a house so overcrowded as to be dangerous or injurious to the health of the inmates, whether or not members of the same family," was held to be a nuisance. But this section was practically a dead letter. The medical officer made a representation to the local authority; he condemned a certain area, and stated that an improvement scheme was necessary. The local authority considered the representation, and sometimes made up its mind to do something. Plans and estimates were prepared and adopted, and the Local Government Board sat upon them; a local inquiry was then held, and in due course a provisional order was issued. After a time the valuers of these dilapidated houses commenced their work. Differences, of course, arose. Then the inevitable arbitration commenced. In the end the local authority realised that the costs, legal and otherwise, were a considerable item, and that it was cheaper to settle than to fight, even though the case was won.

The architect was thus handicapped at the start, as he could not design workmen's dwellings which would repay the capital and pay the interest and working expenses plus this abnormally heavy ground rent. Then what was the remedy? This question was most ably dealt with in a paper read by Mr. Percy Boulnois in the year 1893, in reference to the improvement scheme of the Corporation of Liverpool, where there was an annual loss of £4,512. The Corporation considered this annual charge for clearing the site, too much to be thrown upon the buildings, they accordingly fixed what they considered a fair ground rent, and charged the difference to the rates. This was a way out of the difficulty; but it was only a transfer of account after all, and the fact remained that the difference between income and expenditure must be borne by the ratepayers. Some other remedy must be found to reduce the overcrowding in large towns.

The evils of overcrowding were admitted by all who have studied the question; it was the chief social problem of the age, but he did not think it would be solved by erecting large blocks of buildings in the centres of industry, and crowding the poor together on the same area, only under better conditions. These blocks in twenty years' time might become slums by overcrowding, unless the present high standard of maintenance and supervision was continued. One of the remedies he suggested for overcrowding was the erection of workmen's dwellings in the suburbs of our large towns, where the land can be obtained at a cheap rate. The architect, under such conditions, would have fair play, and he would be able to design healthy dwellings, which would let at a rent sufficient to cover the expenditure, including interest and the payment of the sinking fund. The only condition necessary to render this scheme a success, was a tramway or light railway between the portion of the town where the workman earned his living, and the suburbs where the houses referred to were built. It would pay a local authority in a large town to carry workmen to and fro on a tramway worked by electric traction, at one penny per journey the whole distance. The middle class, and even the clerk, sought a home where there was "more room to live"; and the crowds who flocked into London in the morning by the suburban railways testified to the advantages of the system. Then why should the workman not do the same? The only reasons he knew were: (1) Proper provision was not made by railway companies and local authorities to carry him at a low charge; (2) Many preferred or were compelled, to live near their work. Railway companies were forced by Parliament to provide for the workmen they displaced when they sought powers to widen their lines or increase the areas of their stations; but why should they not be allowed to set apart land for the labouring classes in the suburbs, or build houses and include the railway fare in the rent, such rent not to exceed that paid in the houses they pull down? The housing of the poor was at the bottom of many labour troubles. When a workman paid one-fourth to one-third of his earnings in rent and rates, could we wonder at his action when he agitated for better pay? The price of labour was continually going up, and the cost of building houses followed, rents were increased, and everyone suffered some indirect loss. He hoped Parliament and local authorities would take united action to eradicate this moral cancer which was paralysing our industries. What we wanted in our large towns was expansion, and not concentration, in the interest of the public health, in the interest of temperance, and in the raising of the standard of morality and well-being of the people.

Professor Henry Robinson read a paper on the

Storage of Flood Water,

and said the better conservation of the rainfall was a national question, as the population increased but the water available for their requirements did not increase, and every year there arose a struggle for watersheds from which to obtain the supply for large towns, while the populations in villages too often depended upon shallow wells, which were liable to pollution. There was a grave need of well-considered and comprehensive treatment of watersheds, so that flood waters should be stored, thus rendering the flow of rivers more equable, and the excess water, which now did mischief by causing floods, would be available for domestic supply, irrigation, improving navigation in rivers and canals, &c. The initial difficulty, however, was the cost.

"The developments in hospital planning and construction, resulting from the employment of plenum ventilation," was the subject treated by Mr. William Henman. The plenum system, he pointed out, was the propulsion of air for hospital purposes, and when this means of ventilation was employed the air could be cleansed, tempered, and brought to a suitable hygrometric condition without the necessity for having apparatus of any kind in the habitable parts of the buildings. Unpleasant draughts were avoided, and the effectiveness of appliances for changing the air was fully utilised. Several years of experience had demonstrated that with an efficient means of securing

Ventilation on the Plenum System,

window-opening could, with actual advantage, be dispensed with. Further developments of the system were now being tried, which would provide for a supply of cleansed and tempered air, equal to a change of air ten times per hour night and day throughout the buildings. On looking back to the opposition from many sources which faced him six years ago when it became known that the General Hospital at Birmingham was to be ventilated on the plenum system, and calling to mind the many "high authorities" who, having predicted failure, were now all ready to recognise it as an acknowledged success, he could not suppose that the bolder step would meet with unqualified approval, and although he would not presume to say that absolute perfection would be obtained, he felt thoroughly justified in making the attempt.

(To be concluded.)

Surveying and Sanitary Notes.

Street Improvements at Cleethorpes.—The Local Government Board has written to the District Council sanctioning the borrowing of £3,820 for widening Grimsby Road from Isaacs Hill to Lovett Street, making the road 56ft. wide.

Street Improvements at Sheffield.—At the Town Hall, Sheffield, recently, Mr. C. Perrin, M.Inst. C.E., Local Government Board Inspector, held an inquiry with reference to the application made by the City Council to borrow £38,323, for the purposes of street improvements.

A Street Improvement Case.—At the Grimsby County Police Court last week the magistrates gave judgment in the two objections taken by Mr. Henry Kelly, of Cleethorpes, against his liability to contribute towards the cost of the making of certain private street improvements. Two objections were in effect taken against Mr. Kelly's liability under the Private Streets Works Act, 1892, to contribute towards the cost of the proposed works in Oole Road—(1) that Oole Road is not a street within the meaning of the Act; (2) that he has no right of way over or to make way into Oole Road, and consequently will derive no benefit from the proposed works. In giving judgment the chairman stated that the question for them to determine was not whether the by-laws had been complied with (that was a question to be raised in some other court), but whether the place was a street within the meaning of the Act. It could not be denied that Mr. Kelly's premises were premises "fronting, adjoining, or abutting upon" such street in point of fact. They were immediately contiguous to the road for a considerable part of its length, and only divided from it by a hedge and ditch, which were Mr. Kelly's, and were part of his premises. They thought Mr. Kelly had a right of access to it from his premises through his own hedge and over his ditch. But even if it was a purely private street, want of right of access alone could not prevent premises adjoining it in fact from being premises adjoining it in law also. There was no express authority to that effect, but in their opinion this was the correct interpretation of the statute, but they were clearly of opinion that Mr. Kelly was liable to contribute towards the cost of the proposed works. The next question was whether Mr. Kelly should pay in proportion to his frontage in Oole Road, or whether any abatement should be made by reason of his having at present, as alleged, no right of access to the road, and no building upon the land. Upon that point the Bench said all they could take into consideration was whether the apportioned amount was arithmetically correct according to the measurement of the frontage. In their view they had only jurisdiction to interfere where the local authority had gone out of their way to adopt a different principal of apportionment to the normal and standard principal of apportionment according to frontage. They, therefore, dismissed all Mr. Kelly's objections with costs, but as the chief question had not been decided in any Supreme Court they were quite willing to grant a case if desired.

Masters and Men.

The Dundee Plasterers' Labourers' Strike still remains unsettled.

Newcastle, Gateshead, and District Plasterers have received an advance of wages of 2s. 1d. a week.

Tyne-side and Tees-side Joiners propose to ask the masters for an advance of 2s. per week because the trade is in a good condition.

Mid-Lancashire Engineers' Dispute.—Lord James of Hereford sat at Salisbury on Tuesday, last week, to determine the question of fact whether there existed an agreement between the masters and men in the Mid-Lancashire engineering trade that, if the trade at the end of June continued as good as in March an advance of 1s. a week should be conceded. After hearing evidence and a statement by the accountant who had examined the books in Mid-Lancashire, Lord James intimated that he would give his decision in a week or ten days.

Manchester Plasterers' Dispute.—It will be remembered that at a joint conference between the Manchester Plasterers' Association and the representatives of the plasterers' labourers it was agreed that the men should return to work on Tuesday last week, on the employers undertaking to concede an advance of a farthing per hour and another farthing in six months' time. Much to the employers' surprise the men did not return to work as agreed. They refuse to abide by the agreement until non-Union men have actually been sent out of the town.

Slaters doing Masons' Work.—A mass meeting of slaters in Dundee and district was held last week for the purpose of discussing the charge made by the Trades Council of slaters performing the work of masons and others connected with the building trade. The members, it is understood, did not seek to deny the charge, but held that the system of overlapping was one which prevailed in all trades, while it was also stated that mason work was often contracted out to slaters. These points were the basis of their defence, and a deputation of seven was appointed to appear before the Trades Council and state the case.

Dispute in the Rotherham Stove Grate Trade.—The workmen, to the number of 150, of Messrs. Wright and Co., Stove Grate manufacturers, of Burton Weir Works, Rotherham, went out on strike last week. A difficulty arose with regard to the employment of two youths in one of the departments, and in order to effect their removal, notices to terminate engagements were handed in by the men. These notices expired at the end of last week. The grievance relating to the youths has been settled, but a new difficulty has arisen as to a proposal to alter certain of the conditions of work. It is not expected any serious delay will arise in coming to terms. The workmen are members of the National Union of Stove Grate Workers.

Claim by a Night Watchman's Widow.—In the Glasgow Sheriff's Court, Sheriff Strachan gave his decision in an action brought under the Workmen's Compensation Act, by Mrs. Mary Simpson, widow of John Simpson, night watchman, residing at 5, Bishop Street, Port Dundas, against Messrs. James Graham and Company, wrights and timber merchants, 184, George Street, Glasgow. Plaintiff claimed £163 16s. as compensation for the death of her husband, John Simpson, who, while in the defendants' employment, was killed by slipping off a plank, used as a gangway, at a building being demolished to the east of 144, George Street. Deceased fell 14ft. and broke his neck, his fall, it is averred, being the result of a temporary faintness, which caused him to stumble. There were two other dependents besides the widow, both imbecile daughters of the deceased. His Lordship found that the deceased died from injuries sustained by him while in the employment of the defendants, and awarded £100 to the applicant and £41 to Jessie Simpson, one of the daughters; the other daughter having been for some time in an asylum supported by the local authorities was, therefore, not dependent on the deceased. The defendants pleaded that the death of the deceased did not arise out of or in the course of his employment, as he was crossing the plank to go to the back part of the premises to have his tea. His Lordship said that deceased required to take his tea in the building, as he was prohibited from leaving it, and his doing so was necessarily connected with his employment.

Workmen's Compensation Act Criticised.—Sheriff Fyfe, of Glasgow, issued his decision recently in a case under the Workmen's Compensation Act. The plaintiff was John Jackson, an engine fitter, residing in Crown Street, Glasgow, and the defendants were Messrs. A. Rogers and Co., shipbuilders, Port Glasgow. The sheriff found the defendants liable in compensation to the plaintiff. It seems that the defendants contracted with a Leith firm to build and deliver to it a vessel and engines complete. They subsequently contracted with Messrs. Hall, Brown, Buttery and Co., engineers, of Glasgow, to build the engines and fit them on board the vessel. Plaintiff was employed by this firm, and whilst working on board the vessel on November 8th, 1898, a piece of timber fell upon his head, in consequence of which he lost the sight of his right eye and his other eye was impaired, and he was incapacitated from following his occupation. His average weekly wage previous to the accident was 36s. In a note, the sheriff said that the case very forcibly illustrated the possibilities of protracted and expensive litigation under the Workmen's Compensation Act, the chief glory of which piece of legislation was meant to be the prevention of all litigation. Plaintiff was employed by the engineer sub-contractors and paid by them, and he was engaged at work upon the vessel only at Glasgow, and only in the engineer's department. Nevertheless, under the provisions of this extraordinary piece of legislation, he felt shut up to the conclusion that it was the ship-builders and not the engineers who must compensate this workman. It had been decided that the place where this accident happened was a "factory," and that the defenders were the occupiers of the "factory." On that account the occupiers of this ship-building yard factory, floating in the Glasgow Dock, in virtue of their being occupiers, were the "undertakers" in the sense of the Act, and it was the undertakers who were liable in compensation. All he had to decide, therefore, was the amount of compensation, which he had fixed at 18s. (commencing on November 22, 1898) a week. This was subject to future reconsideration of the Court if the circumstances changed.

The District Hospital, Aberdeen, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

HULL BUILDING TRADE DISPUTE.

At a meeting of the operatives on Tuesday, last week, in the Assembly Rooms, Jarratt Street, Hull, to consider the proposals submitted by the Hull Master Builders' Association at the recently held conference, speeches reviewing the progress of the dispute were made by the chairman (Mr. W. Lawson) and Messrs. Gold, Green, Flannaghan, and Cuttill, after which the audience, which consisted of members of the bricklayers', plasterers', joiners', and builders' labourers' Unions, were invited to vote for or against the acceptance of the masters' proposals, which are as follow :—

1. That all men who left their work at the time the dispute commenced shall return to their respective shops on the old rules (excepting those rules affected by the proposed alteration in boundary and starting places and winter working hours), and it shall be left to the employers' discretion as to what men shall be paid off (if any) after such return.
2. That we intend to act honourably to our non-Union and imported men, and carry out our agreements with them.
3. The Federated masters when requiring men now or in the future shall apply first to the operatives' society for them ; if they fail to supply the number of competent men required, the employers shall have the right to employ all comers, whether they be Union or non-Union men, and that all shall work peaceably together.
4. The masters admit the right of the men to use reasonable persuasion to induce non-Union men to join the Union, and it is further understood that no delegates be allowed to come on any jobs or shops.
5. Foremen shall not be compelled to join the operatives' society, nor compelled by the masters to leave one.
6. That a provisional Board of Conciliation be established, pending the national agreement coming into operation, to deal with any matters that may arise—the Board to consist of one representative from each trade. The President of the Hull Master Builders' Association for the time being shall preside.

When the voting papers were counted it was found that the proposals had been rejected by 1,208 votes to seven. The meeting then proceeded to the consideration of the counter suggestions which the joint committee of their societies had drafted as a basis of settlement, and which are as follow :—

1. That all men who left their work at the time the dispute commenced may return to their respective shops on the old rules, providing there are no imported or objectionable men employed thereat, and the joiners to receive one halfpenny per hour advance on the old rate of wages.
2. That we have no objections to those employers who have non-Union and imported men carrying out their agreements with them.
3. The federated employers when requiring men now, or in the future, shall apply to the operatives' societies for them ; if they fail to supply within a reasonable time the number of men required, the employers shall have a right to employ all comers whether they be Union or non Union men.
4. The workmen claim the right to use reasonable persuasion to induce non-Union men to join the Union, and in case any dispute arise in any shop or on any job, no man to leave his employment until the district delegate has made inquiries and investigated.
5. Managing foremen (that is to say, those who do not work with the tools) shall not be compelled to join the operatives' societies, nor compelled by the employers to leave one.
6. That, in order to meet any difficulties that may arise, we are favourable to the formation of a Conciliation Board to deal promptly with any differences in the future. The number and composition of the board to be mutually arranged.

All the paragraphs with the exception of the first and sixth were rejected on a show of hands. The two excepted paragraphs were made into a resolution, which was moved and seconded and carried unanimously.

A conference between the master builders and workmen was held on Wednesday night for the consideration of the dispute. The operatives' delegates announced the result of the meeting of the men on the previous day, and handed in a copy of the resolution then arrived at, which resolution the masters considered it impossible to accept, saying that to do so would be to renew the trouble, as it provided that Unionists should not work in any shop where "objectionable" men were employed, nor on any job where non-Union men were at work. It was pointed out that many public works were in the hands of master bricklayers and joiners, and it might be that the bricklayers had at work Union men, whilst the joiners had non-Union men, and that complications might thus arise. There being no prospect of agreement the conference was adjourned *sine die*.

Engineering Notes.

Stonehenge Railway Station is to be extended at a cost of between £5,000 and £6,000.

The Darlington Electric Tramway Scheme has been sanctioned by the Light Railway Commissioners.

Victoria Station, Manchester, is being extended by the Lancashire and Yorkshire Railway Company. There will be a great increase in platform accommodation. One principal feature of the extensions is the building of a new and longer bridge over Cheetham Hill Road, more on the Miles Platting side. When this work has been accomplished, and the old road diverted, the existing structure will be pulled down. The Irk will be covered—to the great advantage of the community—between Hunt's Bank and the crossing over the river near Red Bank. Near Corporation Street there will be several new platforms for the accommodation of traffic from the Yorkshire district.

An Iron and Steel Company for Sydney, Cape Breton, Canada.—A syndicate composed of Mr. H. M. Whitney, of Boston, Sir William Van Horne, of Montreal, Senator Cox, of Toronto, and others, has been incorporated as the Dominion Iron and Steel Company. This immense concern expects to be in working order eighteen months from this date, and consists of large iron ore deposits in Cape Breton and Newfoundland. The contracts for the coke ovens have already been given to the United Gas and Coke Company, of Everett; and the blast furnaces, steel converters, and steel mills to the Riter Conly Company, of Pittsburg, which has already over 500 men at work. The output is calculated at 1,000 tons per day in pig iron, steel slabs, and billets, which will make the Montreal Mills independent of the United States for this raw material. The people of Sydney look forward to their town being the Pittsburg of Canada, and they are expecting great things in the future. The Merchants' Bank of Halifax and the Bank of Montreal are on the lookout for sites for branch banks, and a general boom in building is expected.

The Cockett Tunnel.—A report has been issued by Lieutenant-Colonel H. A. Yorke, R.E., Assistant Secretary to the Railway Department of the Board of Trade, giving the result of his inquiry into the partial failure of the roof of Cockett Tunnel, on the Great Western Railway, that occurred on June 19th. The report states that the disaster is to be attributed to the coal workings which have existed for a number of years below the tunnel. These workings belong to the Weigfawr pit, and from 1856 to 1892 were flooded and abandoned. The movement of the tunnel was to be traced to the removal of the water from the workings. Since the accident the fallen arch has been restored by means of eight rings of brickwork laid in cement, and, as it was not considered advisable to fill up the cavity caused by the fall, owing to the danger to which the men so employed would have been exposed, a close timbering of 14in. balks resting at each end on the new arches was inserted, on the top of which brushwood fascines were tightly packed 5ft. deep. The work was completed on July 15th, and goods traffic is now being conducted through the tunnel; but, for the convenience of the engineering department, and in order to expedite the work, it is not proposed to permit passenger trains to pass through until the fixing of the steel ribs at the east end of the tunnel is further advanced. Passenger trains are, therefore, still being diverted *via* Gowerton and Swansea (London and North-Western Railway). The tunnel may at present be regarded as safe, and may, in the opinion of the engineers, be expected to remain so, so long as the conditions as to coal workings remain as they are now. It will, however, require to be carefully watched, and should any fresh signs of scaling or crushing of bricks in the roof show themselves the tunnel should be immediately closed to all traffic.

The Coast Development Company, Limited, have decided to build a new pier at Southwold, in extension of their work of developing the coast, which has already been helped greatly by their piers at Clacton, 1,300ft. in length, and Walton. The contract for the new pier is with Messrs. A. Fasey and Son, of London. The engineer is Mr. Jaffrey, of Victoria Street, W. The length of the pier is to be 700ft., and its construction is to be sufficiently advanced by next year that the steamers will be able to call on their way to Yarmouth. The work, so far, is to cost £7,000, after which a pierhead is to be formed with a concert pavilion on it. It is also intended to erect at Southwold a new hotel, to be called "The Grand," the foundations for which have already been commenced. Mr. C. H. M. Mileham is the architect, and the plans were exhibited at this year's Royal Academy. Walton Pier, which has now an electric railway half a mile in length, will shortly have a pavilion capable of holding 750 persons. The Pier Hotel, which is owned by the Company, has recently been enlarged, redecorated, and handsomely furnished, and a scheme is being prepared to enlarge it. The Company are also erecting on the Round Garden, opposite the railway station, a floral hall and winter gardens, with refreshment rooms, &c., attached, which will be completed by next season. The popular "Belle Steamers," belonging to the Company, close their season on September 25th, which has been so successful that another steamer is now in course of construction by Messrs. Wm. Denny and Bros., of Dumbarton.

Builders' Notes.

A Building Accident occurred at **Arbroath** last week whereby two men were seriously injured. Building improvements are being carried out on the property at the corner of High Street and James Street, and the building had reached the height of the finishing of the second storey. At the corner a series of ornamental projecting stones are being built in, and the two masons, whose names are Peter Carlin and Charles Russell, were engaged placing a stone in the third tier of these when the whole set of stones overbalanced and fell to the ground, 30ft. below, carrying the men with them. Both were seriously hurt, and had to be conveyed to the infirmary.

The L.C.C. Defrauded.—In the County of London Sessions, before Mr. McConnell, Chairman, sitting at Clerkenwell on the 7th inst. James Hutchings and Benjamin Goulding pleaded "Guilty" to an indictment for conspiracy to defraud the London County Council, and for obtaining from them various sums of money amounting in all to £10. Mr. Biron, for the prosecution, said the prisoners had been employed on some building work which was being done by the County Council in the East-end, Hutchings being a timekeeper and Goulding a bricklayer. It was the custom that if any labourer was absent through illness or other good reason he was allowed to authorise a fellow-workman, in writing to draw his wages for him. The prisoners had been obtaining money by means of forged authorities of this kind. Goulding would present a letter purporting to come from some fellow-workman, who really did not exist, authorising him to draw his wages for him. Hutchins would countersign the letter as if the money was in fact due, and so they would obtain payment from the cashier and divide the proceeds between them. They had been defrauding their employers in this way for a month before they were discovered. Hutchins was sentenced to be imprisoned for nine months and Goulding for six months' as prisoners of the second division.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—		
Sept. 22	Winchester—Alterations, &c., to Laundry Block	Workhouse Guardians	Cancellor and Hill, Architects, Winchester.
,, 23	Dunmow, Essex—Horse-boxes, Cart Sheds, &c.	....	Wade, Wix, and Wade, Dunmow.
,, 23	Egremont, Cheshire—Underground Convenience	Wallasey Urban District Council	W. H. Travers, District Surveyor, Public Offices, Egremont.
,, 23	Tudhoe, Durham—Repointing School Front	School Board	S. Adams, 56, North Bondgate, Bishop Auckland.
,, 23	Wickeridge, near Ashburton—Wing to House	....	— Barrons, Weir View, Totnes.
,, 23	Pontypridd—Workhouse and Boundary Walls	Guardians	E. C. Spickett, Clerk, Workhouse, Pontypridd.
,, 25	Clones, Ireland—Schools	....	T. Elliott, 37, Darling-street, Enniskillen.
,, 25	Cerne Abbas, Dorset—Building Works at Workhouse	Union Guardians	A. E. A. Cole, Union Offices, Cerne Abbas, Dorset.
,, 25	Ballyshannon, Ireland—Repairs, &c., to Church	....	T. Elliott, 37, Darling-street, Enniskillen.
,, 25	Consett, Durham—Four Houses	....	R. Robson, Front-street, Leadgate.
,, 25	Halifax—Workshops	....	F. Fielden, 7, Fountain-street, Halifax.
,, 25	Leek, Staffs.—Galvanised Iron Shed	Urban District Council	J. Myatt, Town Surveyor, Town Hall, Leek, Staffs.
,, 25	Scarborough—Detached House	....	J. C. Petch, Architect, Bank-chambers, Scarborough.
,, 26	Cork—Offices, &c.	Lunham Bros., Limited	R. Walker and Son, 17, South-mall, Cork.
,, 26	Edmonton—Supply of Portland Cement	Urban District Council	G. E. Eachus, Engineer, Town Hall, Edmonton.
,, 26	South Shields—School	School Board	F. Rennoldson, 37, King-street, South Shields.
,, 26	Walthamstow—Out Office at Schools	School Board	W. A. Longmore, Bridge-chambers, Hoe-st., Walthamstow.
,, 27	London, W.—Alterations at Woodfield House	Paddington Guardians	F. J. Smith, Parliament-mansions, Victoria-street, S.W.
,, 27	London, S.E.—Tooled Yorkshire Stone	Greenwich Board of Works	J. Spencer, 141, Greenwich-road, Greenwich.
,, 28	Chopwell, Durham—Three Houses	R. Armstrong	Badenoch and Bruce, 55, Pilgrim-street, Newcastle-on-Tyne.
,, 28	Longtown—Villa Residence	....	G. Armstrong, 24, Bank-street, Carlisle.
,, 28	Staines—Infants' School	School Board	Murray and Dibdin, 5, Hurstbourne-road, Forest Hill, S.E.
,, 28	Salford—Tiling Floors, &c., in Town Hall	Town Hall's Committee	Borough Engineer, Town Hall, Salford.
,, 29	Hereford—Renovating Cottage	Standing Joint Committee	A. Dryland, County Surveyor, Hereford.
,, 29	Margate—Coastguard Buildings	Admiralty	Director of Works Department, 21, Northumberland-av., W.C.
,, 30	Hallwill, Devon—Cottage Hospital	....	C. F. A. Voysey, 6, Carlton Hill, N.W.
,, 30	Arundel, Sussex—Billiard Rooms	....	Wheeler and Lodge, Architects, Horsham.
Oct. 1	Cymmau, Wales—Alteration to Chapel	....	W. Lewis, Cymmau.
,, 2	Sowerby Bridge, Yorks—Nine Houses	....	M. Hall, 29, Northgate, Halifax.
,, 2	Handsworth, Staffs.—Stabling, Workshops, &c.	Urban District Council	E. Kenworthy, Engineer, Council House, Handsworth.
,, 2	Erith, Kent—Schools	School Board	W. Egerton, 12, Queen's-road, Erith, Kent.
,, 2	Hastings—Stabling, Loose Boxes, &c.	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
,, 2	Luton—Engine House and Engine Foundations	Brompton, Chatham, &c., Waterworks Company.	J. Taylor, Sons, and S. Crimp, 27, Great George-street, S.W.
,, 3	Basingstoke—Fifteen Cottages	Housing of the Working Classes Committee	G. Fitton, Borough Surveyor, Town Hall, Basingstoke.
,, 3	Lewes—Alteration and Extension of County Hall	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,, 3	Watford—Offices and Warehouse	Benskin's Brewery, Limited	C. P. Ayres, 14A, High-street, Watford.
,, 3	London, S.E.—Underground Urinal	County Council	Architect's Department, 13, Spring-gardens, S.W.
,, 4	London, S.W.—Electric Generating Station	St. Mary's Vestry, Battersea	W. M. Wilkins, Clerk, Municipal-bldgs, Lavender Hill, S.W.
,, 10	London, W.—Post Office Savings Bank	Commissioners of H.M. Works	H. Tanner, Office of Works, Storey's Gate, S.W.
,, 11	Tooting, S.W.—Asylum	Metropolitan Asylums Board	A. and C. Harston, 15, Leadenhall-street, E.C.
,, 12	Wolverhampton—Workhouse Infirmary	Union Guardians	A. Marshall, Architect, King-street, Nottingham.
,, 25	Swansea—Extension of Workhouse	Union Guardians	G. B. Haynes, 8, Fisher-street, Swansea.
	ENGINEERING—		
Sept. 22	Luton—Electric Lighting Plant	Town Council	A. T. Snell, Engineer, Suffolk House, Cannon-street, E.C.
,, 23	Leeds—Retort Installation of Twelve Beds	Gas Committee	R. H. Townsley, General Manager, Municipal-bldgs., Leeds.
,, 25	Guildford—Reconstructing Bridge	Rural District Council	N. Lailey, 16, Great George-street, Westminster.
,, 25	Ilfracombe—Plant	Urban District Council	W. H. Frentham, 39, Victoria-street, Westminster, S.W.
,, 25	Aylesbury—Underground Rain-water Tank	....	R. J. Thomas, County Surveyor, County Hall, Aylesbury.
,, 25	Weston, Pembridge, Hereford—Girder Bridge	Kington Rural District Council	F. Exton, Surveyor, Kington.
,, 27	Runcorn—Electric Lighting	Urban District Council	E. Marshall, Secretary, Town Hall, Runcorn.
,, 27	London, E.C.—Hauling Engines, &c.	Tredegar Iron and Coal Co., Limited	Office, 7, Fenchurch-avenue, London, E.C.
,, 29	Roughton, Norfolk—Tube Well	Urban District Council	A. F. Scott, Surveyor, Church-street, Cromer.
,, 30	Seaford, Sussex—Extension of Outfall Pipe	Urban District Council	W. H. Pawson, 3, Clinton-place, Seaford.
,, 30	Handsworth, Staffs.—Gas Engines and Pumps	Urban District Council	E. Kenworthy, Engineer, Council House, Handsworth.
,, 30	Winwick, near Warrington—Electric Lighting	Asylum Committee of Visitors	J. P. Muspratt, Clerk, County Offices, Preston.
Oct. 3	Blackpool—Widening Railway	Lancs. & Yorks. & L.N.W. Joint Rlwys.	Engineer, Hunt's Bank, Manchester.
,, 3	Blackpool and Kirkham—Railway	Lancs. & Yorks. & L.N.W. Joint Rlwys.	Engineer, Hunt's Bank, Manchester.
,, 3	Sligo—Heating and Ventilating Asylum	District Lunatic Asylum Managers	Sir T. N. Deane and Son, 3, Upper Mervion-street, Dublin.
,, 6	West Bridgford, Notts.—Septic Tank	Urban District Council	W. Pare, George-road, West Bridgford.
,, 9	Rotherham—Electric Lighting	Corporation	H. H. Hickmott, Town Clerk, Rotherham.
	IRON AND STEEL—		
Sept. 22	London, E.C.—Railway Stores	Burma Railways Company, Limited	Offices, 76, Gresham House, Old Broad-street, E.C.
,, 25	Denbigh—Locks	North Wales Asylum	W. Barker, Clerk to Visiting Committee, Asylum, Denbigh.
,, 30	Warrington—Pipes, &c.	Corporation	J. Deas, Engineer, Bank House, Warrington.
Oct. 2	London, N.—Fencing	Edmonton Urban District Council	G. E. Eachus, Engineer, Town Hall, Lower Edmonton, N.
,, 11	Warminster—Pipes	Urban District Council	A. F. Long, Town Engineer, Warminster.
	ROADS AND CARTAGE—		
Sept. 22	Hull—Timber	Corporation	A. E. White, City Engineer, Town Hall, Hull.
,, 23	Surbiton—Road and Sewer Works	Urban District Council	S. Mather, Surveyor to Council, Surbiton.
,, 23	Littlehampton, Sussex—Flints	Urban District Council	A. Shelley, Clerk, Town Offices, Littlehampton.
,, 23	Norwich—Street Works	....	A. E. Collins, City Engineer, Guildhall, Norwich.
,, 25	Reigate—Roads, &c.	....	G. E. Pym and Son, 97, Woods-road, Reigate.
,, 25	Sheerness—Materials	Urban District Council	T. P. Berry, Surveyor to Council, Sheerness.
,, 26	Felling, Durham—Paving	Urban District Council	H. Miller, Surveyor, Council Offices, Felling, R.S.O.
,, 26	Edmonton—Broken Granite	Urban District Council	G. E. Eachus, Engineer, Town Hall, Edmonton.
,, 26	Erdington, Birmingham—Stone	Urban District Council	H. H. Humphries, District Surveyor, Public Hall, Erdington.
,, 27	Hellingly, Sussex—Hire of Steam Road Rollers	Hailsham Rural District Council	J. Huxley, Surveyor, Minster House, Hailsham.
,, 29	Wood Green—Road	....	Vigers and Co., 4, Frederick's-place, Old Jewry, E.C.
,, 30	Sherborne, Dorset—Steam Rolling	County Council	W. J. Fletcher, County Surveyors Office, Wimborne.
,, 30	St. Annes-on-Sea, Lancs.—Making up Streets	Urban District Council	Surveyor, Council Offices, Park-road, St. Annes-on-Sea.
,, 30	Wimborne, Dorset—Steam Rolling	....	W. J. Fletcher, County Surveyor's Office, Wimborne.
Oct. 2	Handsworth—Excavation, &c., for Widening Road	Urban District Council	E. Kenworthy, Surveyor, Council House, Handsworth.
,, 2	Windsor—Widening, &c., Road	Rural District Council	W. Menzies, Surveyor to Council, Englefield Green, Surrey.
,, 2	Handsworth, Staffs.—Stone	Urban District Council	E. Kenworthy, Surveyor, Council House, Handsworth.
,, 2	Hanwell—Broken Granite	Urban District Council	P. J. Dennis, Clerk, Council Offices, Hanwell, W.
,, 3	Carshalton, Surrey—Materials	Urban District Council	W. W. Gale, Surveyor, Council Office, High-st., Carshalton.
,, 3	Felixtowe—Road Works	Urban District Council	G. S. Horton, Surveyor, Town Hall, Felixtowe.
,, 3	Acton—Making-up Roads	Urban District Council	D. J. Ebbetts, 242, High-street, Acton.
,, 4	Leytonstone—Oak Cleft Fence	West Ham Union Guardians	F. E. Hilleary, Clerk, Offices, Union-road, Leytonstone, E.
	SANITARY—		
Sept. 22	Pentre, Glamorgan—Scavenging	Rhondda Urban District Council	W. J. Jones, Surveyor, Council Offices, Pentre, R.S.O.
,, 26	Stow-on-the-Wold—Sewerage and Sewage Disposal Works	Rural District Council	G. B. Witts, 12, Promenade, Cheltenham.
,, 30	Bakewell—Sewerage Works	Rural District Council	Sterling and Swann, Town Hall, Chapel-en-le-Frith.
,, 30	Wolverhampton—Pipe Sewers	Sewerage Committee	J. W. Bradley, Borough Engineer, Wolverhampton.
Oct. 11	Warminster—Laying Sewers	Urban District Council	A. F. Long, Town Engineer, Warminster.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Sept. 28	Hay, Brecknock—Sewerage and Water Supply	£25	C. Griffiths, Clerk to Rural District Council, Hay.
,, 30	Tunbridge Wells—Designs in Tunbridge Ware	£3 3s., £2 2s., £1 1s.	Technical Education Committee.
Oct. 17	Blackpool—School for 1000 Children	....	T. Loftos, Clerk to School Board, Town Hall, Blackpool.
Nov. 30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *vid* New York.

Property and Land Sales.

FREEHOLD BUILDING ESTATE, fronting on main road and close to golf links and Highgate Woods, seven minutes' walk from Muswell Hill and East Finchley stations. To be LET on lease or SOLD in plots. Liberal advances to responsible builders if required. For plans and particulars, apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington-road, N. 5

Under deed of assignment. In the matter of Fred Hart, monumental sculptor, stone and granite works, tile merchant, &c., 48, 85 and 86, Gloucester-road, Brighton.

MESSRS. OLIVER WESTON and SON, are favoured with instructions from the Trustee, Oscar Berry, Esq., F.C.A. (Oscar Berry and Carr), to offer for SALE by PUBLIC TENDER, in four Lots:

Lot 1.—The important, centrally-situated, Freehold properties, 85 and 86, Gloucester-road, 4, Trafalgar-terrace, together with the leaseholds, 46, Red Cross Street, and 7, Pelham-street, Brighton.

Lot 2.—The centrally-situated Leasehold, 48, Gloucester-road, Brighton.

Lot 3.—The entire stock-in-trade of monuments, chimney-pieces, marble, stone, &c., amounting to £412 2s. 6d. at cost or stock book prices, which will be sold at a discount therefrom.

Lot 4.—The entire stock of plain and fancy tiles, amounting at cost or stock book prices to £282 12s. 9d., which will be sold at a discount therefrom.

The stock will be on view at 85 and 86, Gloucester-road, Brighton, on Monday, September 18th, 1899, from 10 a.m. to 4 p.m., and following days. Tenders must be delivered by 12 o'clock on Monday, September 25th, 1899, under seal, and marked, "Tender *re* Hart Estate," and addressed Messrs. Oliver Weston and Son, care of Oscar Berry, Esq. (Messrs. Oscar Berry and Carr), Chartered Accountant, Monument House, Monument-square, London, E.C.

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS

September 27, 1899.
No. CCXLII

Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

The Coddled East and the Neglected West. To journey eastwards, across the many miles of London's streets, from the far western suburbs, is to obtain an object lesson badly needed by those who, sufficiently well acquainted with the developments of the Metropolis in other directions, have acquired no other knowledge of the East than the hazy and incorrect ideas obtained by reading about it in the papers. For twenty years, or more, past, the East End of London has been much written about and missionized. Dock-strikes, recurrent bad times, Society's astonishing interest in the costermonger, and the short period when "slumming" was fashionable—to say nothing of the picturesque writings of journalists on the "horrible East"—have created an impression that, when once Aldgate is passed, there is nothing but a dreary stretch of mean and squalid streets, inhabited by ferocious savages, until, after many miles, the country is reached again beyond Ilford. Now, so far from the slums of Whitechapel being unique, there are undoubtedly as bad—if not possibly worse—to be found in the South, North, and West; in the Borough, up Pentonville way, or in those horrible Central London and West End slums, Eyre Street Hill, where the Italian colony makes a plague-spot, Seven Dials, and the beastly squalor around Lisson Grove.

Where the untravelled in East London go wrong is to imagine that, because there are slums in Whitechapel and Poplar, the whole district should partake of that character. As well believe the West End to be nothing but a poor quarter because of Seven Dials and Lisson Grove aforesaid. A journey down either the Mile End Road or the Commercial Road will help to dispel these uninstructed notions. To begin with, those are thoroughfares of a generous width for which one may look in vain elsewhere in London, and they are by no means so shabby, for instance, as those other main thoroughfares out of London, the Old Kent Road, Wandsworth Road, the Caledonian Road, or the long series of roads that run up to Highgate Archway. The East is not so dolorous a place, either, for a feature of it are the numerous theatres and music-halls on the way, while the churches, chapels, and institutions for the advancement and recreation of the people are more numerous still. Many of the side streets may be uniform and dull, but they are of that firm Puritan respectability which is the last attribute the untravelled would expect to find here.

In fact, the great mass of the East is a solid working-class population of by no means a poverty-stricken kind. For them have been established of late years many institutions that aim at their higher education. Toynbee Hall and the People's Palace are typical, and things are done for these people which no-one would dream of doing for the similar classes in the other quarters of London. If you are a working-man in the East, you will have University Settlements and Extensionists on your track, and free picture exhibitions galore: if, on the other hand, you are a West-end proletarian, the pictures and the institutions are there, but you have to pay to see them or to secure their advantages. If we adventure further east down to Bow and Stratford, and so on to Manor Park and Ilford, we find in Bow old houses of a grave and dignified aspect, given over to working men's clubs; while at Stratford, which is a waterside place, with wharves and mills and such like evidences of commercial activity, there are of course places of an uninviting aspect, along the muddy waters of the river Lea. To this succeeds Upton and Manor Park, places which could, in their trim and excellently-designed villas, and fine modern shops, give a hint to suburbs of a higher social standing.

West Ham, however, is the culmination of cultured modernity. Here, in the West Ham Technical Schools, a municipal undertaking, we find a building with an exquisitely beautiful elevation for which we might seek in vain in the western suburbs. Well-designed ornament gives a fine air to the general aspect, while the well-equipped workshops and the Art Schools are doing for that district a good work which other parts of London might well copy. Such unstinted architecture as this is, indeed, an education of itself in the beautiful, to which it is a delight to turn after the half-hearted attempts at, for instance, Bedford Park, where they teach Art in what is fondly imagined to be a "Queen Anne" building that really looks like a workhouse, and is, in fact, built on the cheapest and shoddiest lines.

C. G. H.

OLD COTTAGE, RANWORTH. SKETCHED BY FREDERICK VIGERS. (*See p.* 113).

Cathedrals and Sanitation.

The educational potentialities of our grand cathedrals, as many abler pens than mine have often pointed out, are immense, and that not merely from the purely artistic or the rigorously technical points of view—no, their value for inspiring lofty thoughts reaches far wider than that. Such lofty thoughts, too, need not be divorced from the practical and the utilitarian. But it must be confessed that their silent teaching in the matter of that important social subject, sanitation, is not of the best. Indeed, it is of the worst. It was a natural desire, and may perhaps have been a commendable one, to turn these sacred edifices into national or local Valhallas. However much sentiment may approve of this, hygienically the conception is all wrong. Science, and, indeed, religion too, teaches us that dust should return unto dust, that all that is mortal of man should be reunited with mother earth. Any violation of this law entails dangers unpleasant to contemplate. Intermural interment is necessarily an infringement of this natural law, and by retarding the normal rapidity of decay and the healthy reassimilation of elements, the atmosphere of cathedrals and churches is unavoidably polluted, and sometimes with serious effects. I have known old churches, close to rivers, where at certain seasons of the year the ground water rose so high as to invade the vaults, breaking up the coffins, setting them floating, and rattling under the pavement. We need only think of the possibility of death from infectious diseases to shudder at the possible results of such a state of affairs. The fact is, sanitarians cannot approve of intermural burial. It is doubtful whether our churches and cathedrals would lose much in the artistic and sentimental way from the absence of tombs, and, at all events, commemorative monuments would be safer, cleaner, and more in accordance with the dictates of Nature and of pure religion. What a truly ghastly sight is the crypt of the Abbey Church of St. Denis, with its royal coffins, railed off in a cage, mouldering before the public gaze.

It is pleasing to find that these views are held by the Church Sanitary Association and the Church of England Burial, Funeral, and Mourning Reform Association. Indeed, the latter society, while discouraging burials inside churches—preferring earth-to-earth burial and commemorative tablets inside the sacred fanes—has memorialised our Cathedral and Abbey authorities to insist upon certain precautions being taken whenever such intermural interments do take place—and even suggesting cremation as advisable under these conditions. This is the teaching of common sense and true piety, of love for the dead and respect for the living. It is also sound science to discourage burials in vaults, whether inside or outside buildings. Indeed, these two societies are doing excellent work in propagating wholesome doctrines in the affairs of the world, which, be it noted, are most influential on spiritual health. The parsons can do much to bring home to everybody, to "vulgarise," the teachings of hygienists so that they may become the daily commonplaces of every individual in the community. Until this is done, architects and others will find their battles on behalf of sanitation hard in the extreme. To come back to our starting point. Our cathedrals and churches should teach the highest lessons in all matters—in sanitation no less than in other affairs of this life.

G. C. R.

On Reflection.

Beauty v. Sanitation.

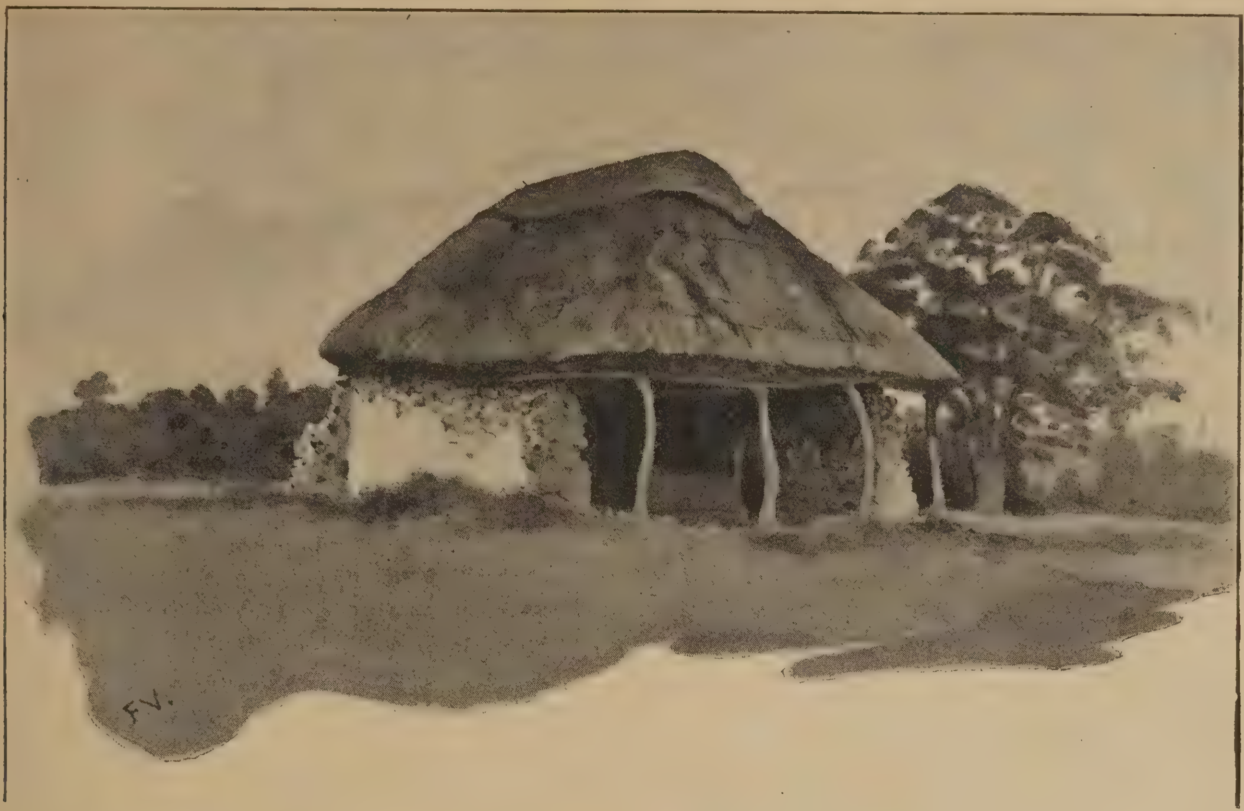
Art and sanitary science do not always, or even generally, go hand in hand. The picturesque country cottages in which architectural sketchers delight are often woefully insanitary, while the "desirable villa residence with all the latest improvements," which is an eyesore to the artistic soul, is often all that the sanitary expert could desire. It would be foolish and irrational to expect that the advance of sanitary science should be checked in deference to the artistic susceptibilities of anybody; all reasonable men must welcome whatever makes for the improved health of the community. Nevertheless we are entitled to demand that sanitarians should exercise some discretion in the application of their useful science. When, for instance, a lovely valley, and a possible public park, is in danger of being ruined by the erection of a dust destructor, there is ample justification for a vigorous protest. This untoward fate is likely—unless a local agitation succeeds in preventing it—to befall the beautiful Bolehills in the neighbourhood of Sheffield, the locality which, on account of its great natural beauty, Mr. Ruskin chose as the scene of his museum. A dust destructor is an admirable thing in its place, but Ruskin's valley is emphatically not its place, and we hope public opinion in Sheffield will prove strong enough to compel the Corporation to find a more fitting site for it.

"Advance Australia."

It is now one hundred and eleven years since the British first settled in Australia, at Port Jackson. In the usual course of events these brave adventurers built themselves huts and storehouses, and then, turning their attention to religion, they erected a wooden church. This was totally destroyed by fire, and so, in July, 1793 (five years after the foundation of the colony), the first stone of a church dedicated to St. Philip was laid by the Lieutenant-Governor, Major Francis Grose. This, says Mr. James Barnet in a recent number of the Journal of the R.I.B.A., may be regarded as the dawn of Architecture in Australia. The church, however useful it may have been, was very hideous, and, in some respects, it is a pleasure to record that it was pulled down in 1856. Sydney had a great champion in the person of Governor Macquarie, as it was under his direction, and owing to his exertions, that many large and important buildings were early erected. The year 1851, that in which the discovery of the gold fields was made, was, naturally, the era of a new civilization, for with the acquisition of money came all the innovations which this magic touchstone can effect. Costly new buildings sprang up, and were followed by larger and more costly ones, with the result that a visitor to Sydney would now be astonished at the advances which the architect, backed up by the Government and by private capitalists, has made. The town now boasts of six principal theatres, besides music halls, and no fewer than seven arcades of shops, while at the present time more than one hundred architects practice there. In a later number of the journal referred to above, Mr. Lloyd Tayler tells the same tale with regard to Melbourne and the colony of Victoria. During the last sixty years the population of the former has grown from 5000 to about 450,000. What a contrast it must be to the man who walked through the streets of the town in 1851—when they were imperfectly formed and drained, generally unpaved, and unlighted—to stand in front of the new General Post Office, or the Law Courts, or the Parliament House! As yet, the architecture of Australia has been imitative, and where certain attempts have been made at originality it cannot be said that an artistic success has been achieved. Still, the spirit of evolution pervades everything, and at this juncture it may, perhaps, be fitting to ask: "Will Australian architects form an architecture of their own"—one which will be noble in form, harmonious in design, tasteful in detail, and commanding in aspect? The future will decide.

Baths for the Poor.

It has often been urged, and no doubt in the majority of cases with truth, that the poor do not keep themselves clean. To convince anyone that this really is so, it is only necessary to take a walk round the slums of a city and to see the squalor and filth and general aspect of negligence which is predominant. It is a curious fact that poverty seems to regard cleanliness and tidiness as a form of affectation, and a thing to be avoided at all hazards, and so we have always with us "the great unwashed." To be fair, it should be admitted that the poor are not entirely to blame, for to them the laying-out of the little money they have for bathing purposes would seem a luxury to be indulged in only on rare occasions. Now, the engineer and chief superintendent of baths at Liverpool (Mr. W. R. Court) comes forward with a practical suggestion. He says there are at present in his city six central public baths establishments where a hot bath can be had for 2d. These are not patronised by the exceedingly poor. Why? Mr. Court is inclined to think that, so far as grown-up people are concerned, the very poor do not care to come in contact with those better clothed and in more affluent circumstances than themselves. Then there is the question of distance. People who have to walk from a quarter to half a mile for a bath, don't use the baths, and if the poor are to be cleansed, the means of doing so must be taken, as it were, to their own doors. The principle to work out is to make the residents in poor districts habitual bathers from choice, and not by compulsion. Therefore plain, substantial, buildings must be erected where a bath can be obtained for a very low sum, say 1d. There has been an active movement going on in Germany during the last twelve years for the establishment of such baths, the subject being first brought to notice by a paper read by Dr. Oscar Lassar before the German Public Health Association in 1886. In Vienna there are now eleven people's baths establishments which have proved an entire success. America has had a similar experience, and the "Lassar-Grove" type of bath (which is without doubt the best) is now being introduced into this country. In people's baths of this kind, the ordinary slipper bath is done away with. "Rain baths," says Mr. Court, "are, from a cleansing point of view, undoubtedly the baths of the future." In a slipper bath the bather washes the dirt off his body and remains in the same water. In the rain bath, as the dirt is washed off it is carried away into the drain, leaving the bather perfectly cleansed. By providing baths for the poor, municipalities would be promoting the health of their cities and the welfare of the inhabitants. The Liverpool Corporation Baths Committee held a meeting on September 20th, when it was decided to recommend the Council to adopt the scheme referred to above, and to erect one bath in a densely-populated part of the city as an experiment. The probable cost of the establishment would be between £1,500 and £2,000, not including the site, and it would require about £300 a year to maintain. Such a wise and sanitary proposal certainly deserves support; we hope the experiment will prove so successful that it will not be very long before "people's baths" are established in every populous centre.



REMAINS OF THE PRIORY, RANWORTH. SKETCHED BY FREDERICK VIGERS.

IN AND AROUND RANWORTH.

By FREDERICK VIGERS.

THE parish of Ranworth, in Norfolk, interesting to archæologists and architects at all times, has become especially so at the present time because its chief attraction, from their point of view—the church of St. Helen—therein has lately been placed in the hands of the restorer.

The sketch on page 115 gives a very fair idea of the exterior of the church, which was built in the fifteenth century, and is beautifully and simply designed.

The details, such as the external arch at the entry of the south porch and the niche above it, the doors, and the remains of the perpendicular windows, are exceptionally good.

The interior is very plain, and before the work of restoration was begun had a very forlorn and squalid appearance.

The roof, which at the beginning of this century was a very rich example of that kind which is often seen in the churches of the same date (specimens can be seen at St. Peter Mancroft in Norwich, and at Martham), has been replaced by one of the meanest possible kind, which does not even serve the purpose of excluding the wind and the rain.

But the glory of Ranworth Church is the Rood Screen, which is probably the best example of the sort in England. It is divided into three portions; the central consists of six open arches on either side of a larger one, by which the chancel is entered from the body of the church; the whole supports a delicately groined and richly decorated ceiling, above which stood the Rood itself. In the panels beneath the six arches are figures of twelve male saints, six on either side, clothed in vestments richly painted and gilt, and these are for the most part in a very good state of preservation.

It is remarkable that these vestments are in many instances painted with sporting subjects, such as hawking after swans, duck, and hares; and that the parish is still famous for its waterfowl.

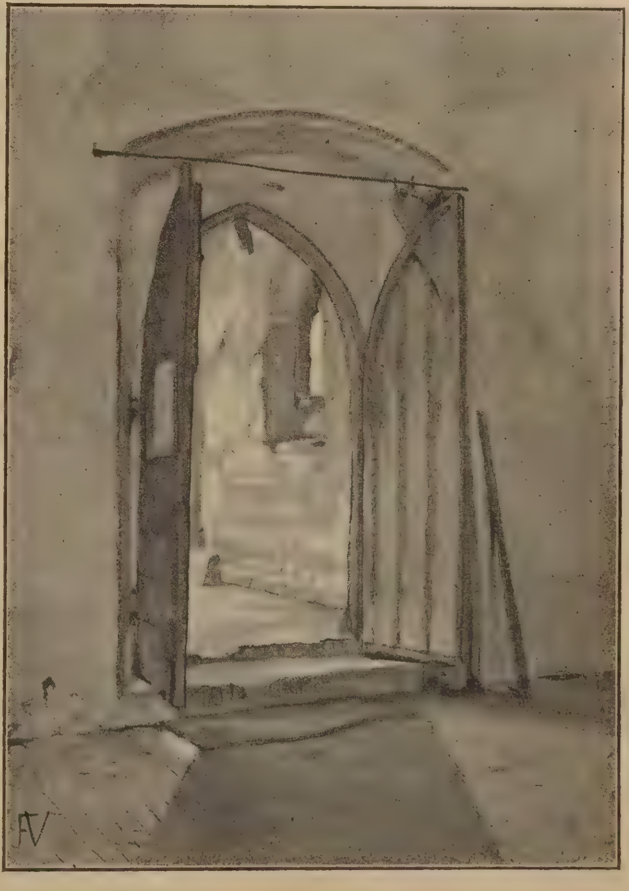
On either side of the central portion small chapels are formed by a reredos of larger panels and a return, at right angles, to the Screen itself. In the south chapel the panels, having felt the full effects of damp and sun, are very much decayed, and considerable portions of the colour have crumbled away in the last few years. In the north chapel is a very peculiar painting, representing St. John the Baptist, which has never been finished; and in the lefthand corner of this chapel is the staircase, opened only recently, leading up to the top of the Screen.

One is told of a tradition that there is a painting on the west wall, near the door, at the foot of a staircase (also recently opened), leading to a chamber over the north porch, and that it was covered with whitewash because the squire of that day was offended by the eyes in it staring at him during service! It is said of the same squire that he had the bells struck with sledge hammers on the occasion of a wedding in the family, because the ropes were too rotten to pull, and that large lumps were knocked out of them in doing so. All the traditions of that sort have been fathered on him, whether rightly or wrongly I cannot say.

Next to the church in point of interest comes the Priory, the few remains of which stand at the west end of the parish, and of them the most considerable portion is used as a barn. It is built of flint rubble, with large buttresses, and, having been repaired from time to time with red brick, it has a very picturesque appearance.

Close by this is another building, also built of the same material, which is now used as a cart lodge. It consists of a central room with the remains of the walls, which went to form others, all of them having been coated with plaster.

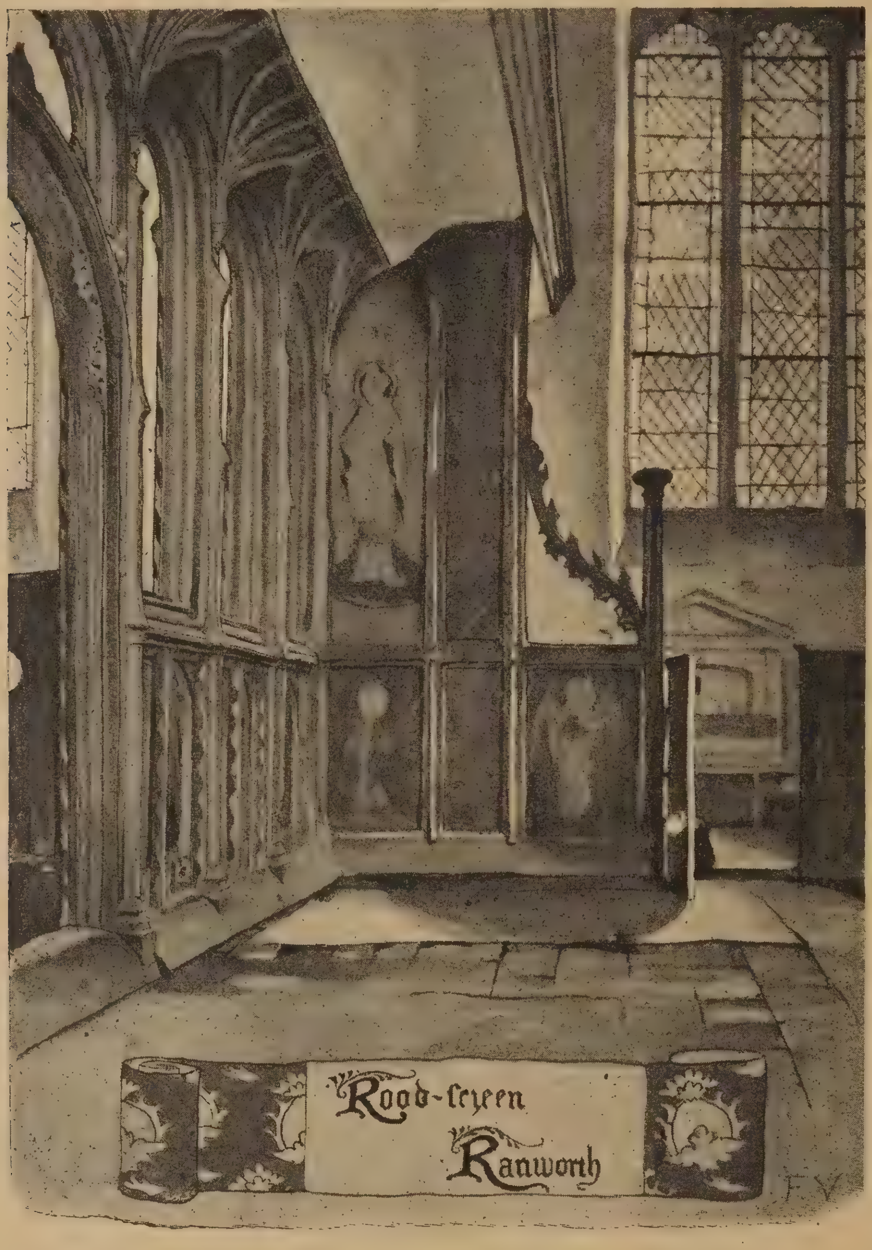
At the north-west corner of the buildings is the burial ground of the Monastery, various



SOUTH DOOR AND PORCH, RANWORTH. SKETCHED BY FREDERICK VIGERS.

stone coffins having been dug up in forming the osier bed which is there now.

With the exception of the cart lodge above mentioned, all the monastic buildings seem either to have been converted into farm premises at the time of the Dissolution, when the house known now as the Old Hall was built, or the materials from them were used in building the greater part of the better sort of houses in the parish. One comes across fragments of wrought stone bedded in the latter brick houses; and there is a considerable collection of it, such as carved capitals and shafts to pillars, portions of mouldings and various other objects, in the garden of Miss Kerrison, the lady of the manor. The Priory of Ranworth was part of the property of the Abbey of Langley, and at the Dissolution it was acquired by the family of Holdiche, a member of which, Thomas by name, son of Robert, lies buried in the church; according to the inscription on his monument he died in 1579.



SKETCHED BY FREDERICK VIGERS.

From the Holdiches it passed by marriage to the Sidleys; from them to the Houghtons; and, lastly, to the Kerrisons, in whose possession it now is.

The old hall itself is a very picturesque Tudor house of red, crossed with a network of black, brick.

The mullions to the windows and the roofs to the steps of the gables are of terra cotta.

The charm in the appearance of the old house, and also of the large barns which stand near it, lies in the very good, and at the same time sturdy-looking, proportions of them all, with, of course, the additional beauty which Time has given.

All appearance of former respectability and every sort of interest has disappeared from the interior, and the house is now occupied by farm labourers.

In the garden stands a quaint old pavilion, which till quite recently was surmounted by two graceful pinnacles of moulded brick and stone; but these have now fallen down, and the fragments become scattered about.

The parish is full of traditions (there is a ghost story in connection with this very old house) and is altogether a very interesting and, on account of its position by the side of the Broads, a very beautiful place.

Mr. William Willmer Pocock, F.R.I.B.A., died at his residence, Glendore, Tunbridge Wells, on Monday, last week, in his 86th year. He was the architect of the late Rev. C. H. Spurgeon's Tabernacle in Newington Butts. He also designed several other public buildings, the last being the hall of the Carpenters' Company, in Throgmorton Avenue. He was educated at King's College, where he received the honour of A.K.C., and subsequently passed the B.A. examination in the London University.

CONSTRUCTION OF COTTAGES FOR AGRICULTURAL LABOURERS.*

By GEORGE H. SMITH, P.A.S.I.

THE great depression of prices and diminished incomes received by agricultural landowners of recent years has made the question of cost enter largely into the consideration of cottage building. A labourer earning a wage of 14s. per week, with a wife and family to maintain, cannot be expected to pay a rent sufficient to invite speculators to build for investment, and this being the case, it would seem that £300 per pair of cottages is about the highest amount that can usually be spent in building.

Every cottage should contain a parlour and kitchen, with small larder adjoining, on the ground floor, and not less than three bedrooms upstairs. As a general rule, the size of the parlour and kitchen should not be less than 150ft. superficial, and, for the bedrooms, 100ft. for one and 80ft. for the others should be the minimum. The height of the rooms on the ground floor should be 8ft. 6in., and upstairs 8ft. is the minimum, but if the ceiling is coved they should not be less than 5ft. at the lowest part, with 9ft. for an area equal to one-half the floor surface.

The front door should never open directly into the parlour, but into a lobby at the foot of the staircase, which tends to better ventilation upstairs.

The kitchen should have a strong open range in preference to a closed kitchener, on account of its being more cheerful when the room is used for sitting in. A small stoneware white glazed sink should be provided in a convenient corner, and it is very desirable to fit up a strong enamelled iron bath near the fireplace, with a deal hinged top to form a seat when not in use. The hot water can easily be supplied from the range by means of a pail.

All bedrooms should have fireplaces to assist in the ventilation of the room, and should also have additional means of air-inlet and outlet, such as a plain bracket-box with an air brick and flue through the wall, and an outlet into a special flue in the chimney.

The external walls should never be less than 9in. in thickness, even if covered externally with rough cast or tile hanging, and on no account must the damp-proof course be omitted.

The ground-floor can be cheaply constructed with deal blocks, 9in. by 4in. and 2½in. or 3in. thick, bedded in pitch and tar, and laid on a 6in. bed of concrete cement. The upper floors, the author considers, may, with great advantage and less expense than usual, be formed of 3in. deal decking, tongued and grooved and caulked with tow, with the upper surface twice varnished, carried on timber beams about 4ft. apart.

Partition walls should always be of brick in cement.

The roofs should be boarded and felted, as this greatly lessens the cost of repairs.

Party walls should never be carried through the roof, as it adds considerably to the cost, besides increasing the risk of rain entering.

The author finds that one of the most successful methods of dealing with the waste water is to treat it by sub-irrigation by a tile drain down the garden; the solid excreta being collected in a galvanised iron waggon, with a capacity sufficient to require emptying once a week.

The water supply can often be obtained by means of a tube well at much less cost than sinking an ordinary brick-steined well, and at the same time preventing any risk of contamination of the water supply.

In conclusion, the author would insist that only the best materials and workmanship should be used; although, perhaps, more costly at first, there is a considerable saving in the annual repairs afterwards.

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* Abstract of a Paper read before the Annual Congress of the Sanitary Institute, held at Southampton on August 29th, 30th, and 31st.

MOSAIC.

I.—SOME GENERAL PRINCIPLES AND REFLECTIONS.

By GEORGE BRIDGE.

MOSAIC is an absolutely permanent form of applied colour decoration employed as a component part of an architectural scheme. It is applicable to floors, walls, and ceilings, and is as suitable to domestic and commercial buildings as it is to edifices of a more ecclesiastical character. From its imperishableness it is equally serviceable as an external or internal decoration.

"Nuttall's Dictionary" gives a very misleading definition, although, perhaps, a popular one, namely, "Mosaic—In painting a species of representatation, &c." The dictionary makes the very common error of classifying mosaic under painting instead of describing it as an auxiliary in architecture.

The method of working is determined entirely by the position the work is to occupy, and this also governs the size and shape of the tesseræ. Thus pavements, hearths, firebacks, dadoes, and all work in similar positions should be finished with a perfectly smooth surface. This is self-evident in pavement work, and the rule applies to all work which from its position is liable to contact with passing bodies. When work is higher than six feet it can be finished with a fairly rough surface, and the higher the position of the mosaic the coarser should be the execution, as there is a certain texture in mosaic only obtainable by a studied coarseness in the method of manipulation.

Design for mosaic pavements should be extremely simple, but while keeping it flat and conventional, the draughtsman should remember that he has a perfectly free choice as to the form and subject to be used in the mosaic. The nature of the material gives him greater freedom than when designing for tiles; indeed, it is almost grotesque to see a mosaic pavement executed to a design that has been reduced to the narrow limits imposed upon the tiler, who must necessarily confine himself to severe geometrical patterns.

Wall ceilings and similar spaces can be treated with infinite variety of design, and the tesseræ being worked into a putty mastic may be of any shape or size that will suggest itself as the most serviceable for the position occupied, and that will most easily assist the flow of the design.

The most perfect architectural schemes owe a great deal to the assistance rendered to them by sculptured and coloured decoration. Indeed, no building can be considered complete without the aid of colour; if it has not been suggested in the original design, time, in all cases, lends its help to supply the deficiency. One need not be a great traveller to know buildings that have received considerable interest and beauty from natural colouring, and, indeed, many bad specimens of architecture that have been adorned and rendered beautiful by Time's tender covering.

There is a great need for applied colour upon the external elevations of London buildings, and mosaic is the art that suggests itself as being the most legitimate form such colour decoration should take. It is the most beautiful, as it is capable of greater variety and richness than any other architectural decoration.

It is the most durable form of applying colour, as so long as the building upon which it is placed exists the mosaic, being imperishable, will exist also.

Mosaic has suffered very great neglect of latter years by architects, artists, and art critics. All other crafts have been brought into popularity by being written about and practised by architects and artists, but mosaic has been almost totally ignored. Of course, there are the experiments at St. Paul's Cathedral, but these are the solitary instances in all London. Circulars sent out from galleries inviting specimens for art and craft exhibitions, mention every art and craft but mosaic. Critics when writing of the advance made in other art crafts, never seem to remember there is such an art as mosaic. Mosaic is not taught at any of the technical schools where not only every art, but every trade is taught, from plastering to jewel setting. At the Paris Exhibition mosaic is certainly given a space, but it is as a trade only. At the Royal Academy the president and council will not accept mosaic for exhibition.

Mosaic is an art that should certainly be taught, not only in the technical schools, but at all institutions where Art is taught, so that artists as well as architects, would thoroughly understand how to design for the work—the limitations imposed by the material, and the proper position a mosaic should take in an architectural scheme.

RANWORTH CHURCH, NORFOLK. SKETCHED BY FREDERICK VIGERS.

At present a student has very few opportunities to study mosaic work, or even other forms of colour decoration. In most cases the methods adopted are only instances of what to avoid from an architectural point of view.

In the streets, the more radical of our architects, in their desire to remove the stigma of want of appreciation of colour, have gone to the opposite extreme, and in a few instances have built their elevations from footings to parapet of coloured glazed bricks. The consequence is that in our chief thoroughfares are prominent buildings, looking like bold advertisements for mustard, chocolate, blue, sealing-wax, and other crude commodities, the hues of which, in their primary intensity, are more calculated to catch the eye, and give satisfaction to the feminine youth of Whitechapel than to be welcomed as an architectural feature by architects who may be practising in the vicinity. One has only to imagine a compulsory existence in a street of houses, the fronts of which have been erected with glazed bricks or faience of the tint of mustard, to appreciate the want of taste displayed by architects who use these colours in the wholesale manner indicated.

Apart from these very few hot-headed revolutionists, the architectural profession is as conservative in its prejudices and tastes as most other British institutions and professions. Mosaic is not used or specified as a decoration by other architects; therefore it never suggests itself to the individual Besides, there is always the trouble of finding designers and workers; and, again, nobody seems to know or care anything about the art, so they let it rest, and specify something from a numbered list. Even the architects who do specify that mosaic should be used are generally content with scrappy little patches of gold in their buildings, or if they intend to use larger panels they will set to work in the same manner that they would to order rain-water pipes. They will send for somebody's traveller who has pestered them a sufficient length of time, and ask him for a price per yard for ornament, a price per yard for draped figures, and a price per yard for more or less nude figures. His price being accepted, the traveller will submit designs, these will be accepted, or they will be altered to suit, and the architect is comparatively finished with the mosaic question; he will look at it at the finish to see if it is as flat as a plate glass window, wonder how it is all done, and give a certificate.

The way it is generally done by this class of so-called mosaic workers is this: The traveller is almost always a representative of an Italian firm (this kind of architect imagines that mosaic must come from Italy). The designs are stock drawings that have done service for centuries in all parts of the world, that have been enlarged, reduced, or cut up or added to from other designs, or used as stained-glass window patterns, or manipulated into frescoes. The design is faked to fit the architect's space and sent to Italy, where it is cut up into pieces and given out for the poorest class of Italians to take to their homes (the same way exactly as the sweaters among London tailors distribute their suits to be made). Whole families are employed in this way, and a fairly large mosaic is distributed among quite a number in all directions. These people buy the glass used from different makers, one tint from one firm, and, again, others from quite different people. The glass is stuck upon cardboard to the design, and sent to the firm, who, in turn, forward it to London, where the pieces are joined together and put into position like a Chinese puzzle. That is how they set about a work of art, and the best Italian firms, with world-wide reputations, reduce mosaic to this mechanical reproduction. No wonder architects, artists, and public think of mosaic only as a trade when they are in the habit of going abroad for it.

THE OLD HALL, RANWORTH. SKETCHED BY FREDERICK VIGERS. (*See p.* 113.)

Thus is the average architect conservative; if there is no desire for art, he will not go out of his way to induce his client to use it. He surrounds himself with numbered catalogues, writes his specification from them, and waits for some broader-minded member of his profession to strike out a new line of thought. Should the new line take with the public, then —good, bad, or indifferent—the idea is copied and reproduced, and often caricatured and overdone.

No; the average architect is not the one to whom the mosaic worker can look to produce a splendid mosaic, or indeed any big colour scheme. If he looks to artists, their training does not seem to fit them for any big work—it does not follow that because a man is a good portrait painter or landscape artist that he knows anything about the proper application of colour decoration. There are several instances in the Royal Exchange of the inability of the ordinarily successful artist to supply a decoration appropriately architectural in conception and execution. Here there were panels to be decorated, and the architectural scheme quite suggests that the decoration should be treated as a decorative design (and not in a pictoral sense), and that it should have been executed in some such material as mosaic, bronze, marble, or anything that being placed upon the walls would not only become a portion of the walls, but would last as long as the building existed. The artists receiving the commissions have simply painted pictures more or less perishable, and just the commonplace pictures one sees every year at the Royal Academy that would look perfectly appropriate upon the walls of some well-to-do citizen's surburban villa, but fall very short of the purpose they are supposed to fulfil from an architectural point of view.

Seemingly, even among well-known artists and architects, there are very few who appreciate the laws and limits which should confine the architectural decorator to a purely simple and direct means of making the most of the material to be used.

In South Kensington Museum are some twenty or thirty panels filled with mosaic copies of pictures prepared for the purpose by P.R.A.'s, R.A.'s, and A.R.A.'s, and not one of the mosaics shows that the artist who painted the original knew anything about the mosaic worker's art. They have just sat down and painted an oil painting and given it to a mosaic worker with instructions to copy it, and in every case the unmosaic-like design has been converted into a mosaic like an oil painting, every little brush mark has been faithfully reproduced, every minute painter's detail defined, and they have been placed (no doubt after very great expense) upon the walls of our great Art Museum. These bastard productions are neither oil-paintings nor mosaics.

There are other forms of bastard mosaics, those little monstrosities, mosaic jewellery (they have some at South Kensington), which the travelled public generally bring home from Venice. Mosaic is certainly not the proper medium for colouring jewellery. Cloisonne enamel is the most legitimate form of applying colour to gold and silversmith's work. A similar misapplication of mosaic is of very common occurrence among the Italian firms—they apply it to furniture and even to panels of doors, and, worse still, to picture frames and mirror frames. Surely inlays of wood or ivory are the only permissible forms of decoration—approaching mosaic—for such subordinate things as frames. But the Italians make the frames for pictures, themselves pictures, and worse still pictures in mosaic.

(*To be continued.*)

The Corner Stone of a New Theatre at Salford, to be called the Victoria Theatre, is to be laid by Sir Henry Irving on October 4th.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

A LAW CASE.

To the Editor of The Builders' Journal.

Sir,—Can you give us reference where we can find a report of the case *Dodd* v. *Churton?* It is a case bearing on the question of the time penalty and extras, under a building contract.—Yours, &c. C.

Dodd v. *Churton* is reported in the Law Reports (1897) 1 Q.B. 562, and 76 Law Times Reports 438, and 45 Weekly Reporter 490.

H. P. B.

ORDNANCE SURVEY MAPS.

To the Editor of The Builders' Journal.

Linlithgow.

Sir,—On the ordnance survey maps (of the largest scale) are fine dotted lines, running all over the paper, intercepted at every little bit by larger dots, and at greater distances by the sign ⊙. Could you inform me what these lines indicate?—Yours, &c., STUDENT.

We believe that the lines to which our correspondent refers are the contour lines showing the elevation. These, however, only appear on the 1in. and 6in. scales, and not on the larger, except in a very few instances. We cannot, however, be quite certain without seeing the lines in question, but there is a pamphlet published by the Ordnance Survey Department giving a description of the various characteristics, from which our correspondent could obtain all the information he needs. Its price is 6d.

DRAWING PAPER FOR PERSPECTIVES.

To the Editor of The Builders' Journal.

Linlithgow.

Sir,—I would be obliged if you could give me an answer, through the columns of your valuable paper, to the following question:—

I am desirous of making a perspective drawing and painting of a picturesque villa. I have tried several kinds of drawing paper, but they all curl up and warp when painted on. Could you recommend a kind, suitable for my purpose? STUDENT.

"Student" is unfortunate. We have used Whatman's paper for years, and many other kinds, none of which have given any trouble. Before "painting" is commenced, the paper should be strained; that is, moistened until it has expanded to its full size, and then the edges stuck down to a drawing board. When the paper dries it endeavours to contract, but, of course, cannot, and so remains stretched as tight as a drum. R. W. C.

PAYMENT FOR ARCHITECT'S SERVICES.

To the Editor of The Builders' Journal.

London, S.E.

Sir,—A friend of mine requested an architect to prepare plans, specification, and estimate for a house to cost about £600. The plans were prepared in pencil only, the specification made, quantities taken out, and three estimates procured, the lowest being £1390. This being so much more than my friend was inclined to spend, the work was abandoned. Will you kindly inform me, through your column of "Enquiries Answered," what the architect's charges should be?—Yours, &c., J. A.

So great an excess over the sum stipulated is *prima facie* evidence of negligence on the part of the architect to comply, or even to attempt to comply, with his client's wishes, in which case he can claim no payment whatever. If any claim at all can be substantiated, it would be for the full fees in accordance with the R.I.B.A. Schedule. G. A. T. M.

COVERING OF GRAVES IN CHURCH EXTENSION.

To the Editor of The Builders' Journal.

Barnsley.

Sir,—Will you kindly inform me whether there is an Act of Parliament or a law of any kind in existence regarding the covering of graves in a church extension? Is it necessary, after covering the site with concrete, to leave an air space between the concrete and the floor, and, if so, is there any minimum depth for such an air space? What is the usual method of carrying stone floors in such cases? If I am right in the idea that a law exists on this subject, I shall be pleased if you can give me the particulars of it and the best place to obtain a copy. Of course, a Faculty is granted for the work.—Yours truly,

G. W. S.

I am not aware of any law regarding the covering of graves in a church extension. The regulations as to burials will be found collected in Baker's Law Relating to Burials, 6th ed., Sweet and Maxwell, 3, Chancery-lane, 1898.—H. P. B.

INTERFERENCE OF CLIENT.

To the Editor of The Builders' Journal.

Sir,—Will you kindly inform me the proper course for an architect to pursue where his client unduly interferes with him and the contractor, and obtains the advice of an outsider for the purpose of raising vexatious and unreasonable objections to the work? Is he justified in throwing up the work, and, if so, what is the law as to fees in the case of the job being nearly completed? Would the architect be able to recover the full amount of his fees for superintending the work, after making some slight allowance owing to the work being not quite, though nearly completed, or would the fact of his electing to get out of the matter altogether prevent his suing for fees for superintendence? Also would he be justified in withholding the plans and specification from the client, when the latter applies for them for the purpose of consulting his adviser, who is evidently an amateur architect, or architectural handyman? VEXED.

If the interference is such as absolutely to prevent the architect from properly discharging his duties, he is entitled to refuse to continue to act, and to sue on a *quantum mesnit* for the value of the services rendered up to the time he withdraws, or for damages for breach of contract preventing him continuing and earning his remuneration; but if the interference is merely vexatious and annoying, however difficult it may be to bear with it, the architect should put up with it, and get the work carried out as best he can. If the client requires the work to be done in some manner different from what the architect has designed or specified, he should point out the injurious consequences likely to ensue, and throw the responsibility on him. If the client has paid for plans and specifications, they are his, and the architect cannot refuse to hand them over to him, no matter what may be the purpose the client intends to use them for. If they have not been paid for the architect may refuse to part with them for any purpose until they have been paid for. H. P. B.

BY-LAWS ON WALLS.

To the Editor of The Builders' Journal.

Colwyn Bay.

Sir,—I should be extremely grateful if you would kindly enlighten me on the following matters in the next issue of your valuable journal.

1. Can a local authority, who have adopted the Local Government Board's Model Bylaws for new Streets and Buildings (1875), insist under any clause in the by-laws, for internal brick partition walls, to be built of a greater thickness than 4½in.; seeing that section (19) provides for the minimum thickness of external or party walls only?

2. In a detached house, four storys high, is it legal under these bylaws to erect 4½in. brick partition walls from the level of ground floor up to height of topmost story?

3. What is meant by a cross wall under these bylaws?

4. Are a cross wall and a partition wall synonymous?—Yours, &c., IN THE DARK.

(1) A partition wall, if it be a "cross wall," and if it, as a return wall, determine the length of another wall, must be at least 9in. thick, and at least two-thirds of the thickness prescribed by the by-laws for an external or party wall of the same height and length, and belonging to the same class of building. Sect. 21.

(2) Not if they be cross walls which, as return walls, determine the length of other walls.

(3) A "cross wall" is one carried up to the top of the topmost story, when in each story the extent of the vertical faces or elevations of all the recesses and openings therein does not exceed one-half of the whole extent of the vertical face or elevation of the wall in that story. Sect. 18 (iii.).

(4) No. Some partition walls are cross walls, and some not.

Note.—The length of a wall is to be measured from the centre of one return wall to the centre of another, provided the return walls are party walls. External walls or *cross walls* of the thickness prescribed by the by-laws into the walls so deemed to be divided. Sect. 18 (iii.). H. P. B.

Correspondence.

STONE CHURCH, KENT.

To the Editor of The Builders' Journal.

Wolverhampton.

Sir,—In reply to the inquiry in your issue of Sept. 13th about Stone Church, Kent, there is a short description with a complete set of measured drawings of Stone Church, Kent, in Cavelar's "Gothic Architecture," part IV. (1835). W. J. R.

[Further information with regard to this church appeared in our correspondence columns last week. The illustrated article on Stone Church, which we have in hand, is held over until next week.—Ed.]

IS OUR PRESENT SYSTEM OF EXAMINATION A FAILURE?

To the Editor of The Builders' Journal.

London, S.W.

Dear Sir,—I was greatly interested by the letter under the above heading in your last week's issue, and agree with the author's remarks as far as they go. But apart from the examiner himself there are other matters which assist in showing the inadequacy of examinations in general as at present conducted. The most prominent of these is probably the amount of confidence possessed by the individual examinee.

Take, for example, two students sitting at the same time for the same examination. One may sit down calmly and put on his paper as much as he knows in answer to the questions, while the other may, owing to natural nervousness, be totally upset at the idea of an examination. The former may pass while the latter fails—not from lack of knowledge, for, in this respect, he might be by far the better of the two. This is, of course, far more noticeable where oral examination is adopted in place of, or to follow, a written paper.

It is impossible under such conditions to decide by the present system, which man or woman is the best suited to occupy any particular post, because although a person may dread an examination, it is no reason why he may not be thoroughly capable of performing his work in practice.

Again, the system at present in vogue is open to an unlimited amount of mere cramming in almost every case. The questions year after year are little more than repetitions, and a student who can work out from memory the last three or four papers which have been set will in all probability pass at the next examination. In many cases subjects are included which are totally foreign to the requirements of the examinee, and he has to waste his time in studying these, when he might be turning it to better account.

Trusting you will publish this in your valuable paper, and hoping other opinions may follow.—Yours faithfully,

PERCIVAL E. GLOYN.

Keystones.

A New Organ at the Royal Academy of Music.—A new three manual organ, by Messrs. Willis and Sons, has been placed in the concert room.

The First Monument to Brahms, in Germany, will be unveiled on October 7th at Meiningen. The monument is the work of Professor Hildebrand, of Berlin.

A New Hotel is to be erected at Padstow, to cost about £10,000, from designs by Mr. John Ennor, jun., of Newquay. The hotel will be called the South-Western Hotel.

The Foundation Stone of a New Church at Carlisle was recently laid by the Duchess of Devonshire. The church is to be built in Warwick Road, at a cost of about £8,000, from designs by Mr. C. J. Ferguson.

Proposed New Hospital for Leeds.—Dr. S. W. Wheaton, an inspector under the Local Government Board, conducted a public inquiry recently at the Leeds Town Hall, into the application of the City Council for sanction to a loan of £21,250 for the purchase of the Killingbeck Hall Estate as a site for a small-pox hospital.

The Eiffel Tower is undergoing a complete overhaul to prepare it for next year's exhibition. It is to be entirely painted with an enamel paint in five shades. The dome and summit are to be of a light yellow chrome, the shade graduating to the pedestal, which will be a rich dark orange colour. For the two coats which are to be put on the structure, nearly fifty tons of paint will be required.

A Terra-cotta Statue of the Queen has been erected by Messrs. Bulton and Co., Limited, in front of their works at Lambeth, opposite the Tate Gallery. It is about 12ft. high, and represents her Majesty, when she was some years younger, in full robes of State, and wearing the ribbon of the Order of the Garter. In the right hand she holds the emblem of sovereignty, and in the left a globe, the emblem of supremacy.

A New Primitive Methodist Church at Harrogate.—The memorial stones of a new Primitive Methodist Church were recently laid at Harrogate. The site of the church is in Bowes Road, and the building, which is in the decorated Gothic style, will have a tower and spire rising to a height of 100ft. Adjoining there will be a schoolroom, lecture hall, eight vestries, and a caretaker's house. The church will have accommodation for 550 worshippers. Mr. W. J. Morley, F.R.I.B.A., estimates the cost of the church, land, organ and other contingencies at £8,250.

New Candelabra in St. Paul's.—The candelabra in course of erection at St. Paul's Cathedral are now almost completed. One of these massive ornaments is the gift of Mr. Douglas Murray, in memory of his father, who was a prebendary of the cathedral; and the other has been given by the Decoration Committee. The candelabra are in bronze, and, mounted on a heavy slab of Irish fossil stone, rise to a height of nearly 15ft. Around the base in bold relief are three figures representing the white, yellow, and black races of mankind Figures of archangels support the stems for the lamps.

A New Gas.—The township of Hunmanby, a village between Scarborough and Bridlington, will in future be lighted with electroid gas, the new illuminant which it is claimed by the Scarborough District Lighting Company, Limited, will revolutionise the lighting of villages, urban districts, and country mansions. Electroid gas is acetylene with the admixture of inert matter and a proportion of oxygen. Its manufacture is simple, and the gas can be delivered through any ordinary gas main pipes at the ordinary pressure. It can be measured by means of gas meters and charged for in the same way as is the custom where ordinary coal gas is used. It is a light of great purity and brilliancy. The Scarborough District Lighting Company propose to light a considerable number of villages throughout Yorkshire with the new gas.

A New Organ at Copgrove Church.—The quaint old church of Copgrove has recently been restored, and a new organ, made by Messrs. Abbott and Smith, of Leeds, has been presented by Captain Bridgeman.

New Church at Sefton Park, Liverpool.—A new Episcopal Protestant Church was recently opened in Smithdown Road. The building, which is of corrugated iron and has accommodation for over 1000 persons, has been erected by the late Mr. J. A. Bramley-Moore, of Aigburth.

St. George's Church, Birmingham, has been renovated at a cost of £1,300. The chancel and nave have been cleaned and decorated, new seats have been introduced, a new hot-water system of heating has been adopted, and the exterior stonework of the west end has been restored.

A Furnishing Entertainment.—A smoking concert was held last Saturday week at the "Prince of Wales," Kensington, by the Drawing and Prime Cost office staff and foremen from Waring and Gillow's Hammersmith factory. Mr. A. E. Millington was in the chair. A very enjoyable evening was spent.

A New Granite Quarry is to be opened at Ty Mawr, Pistyll, Carnarvon, by a Liverpool syndicate, who have acquired about fifty acres of property in this district. This property includes a dock, from which the stone can be cheaply shipped. Both red and blue granite are obtainable, and the quality is said to be excellent.

The Yorkshire Foresters' Orphanage and Convalescent Home at Bridlington was opened recently by J. T. Firbank, Esq., M.P. for East Hull, in the presence of a large concourse of members of friendly societies. The building has been erected by Messrs. F. Blackburn and Son, of Hull, and the architect is Mr. Robert J. Beale, A.R.I.B.A., of London, whose design was selected in open competition.

Sir John Brunner, M.P., has made to the borough of Bulach, in the Canton of Zurich, in Switzerland, a gift of £5,000 for the purpose of building a small hospital, which will bear the name of the Brunner family, whose members were burgesses of Bulach since the early part of the fifteenth century. Sir John Brunner has also presented the new Swiss National Museum at Zurich with £1,000 to be devoted to the purchase of one or more ancient works of art for the treasure room of the museum.

The Liver Sketching Club at Liverpool intend to hold the usual Winter Exhibition at their rooms in Dale Street, commencing on Monday, November 27th. The private view will be held on the Saturday immediately preceding. Last year's exhibition was by far the most successful the club has ever held, and it is confidently expected that the coming one will not fall below the standard then established. The hanging committee will be composed of the following members:—Messrs. C. O'Neill, J. H. Tyson, S. J. Hertford, and R. Wane.

Historic Properties.—Recently, quite a number of historic properties have changed hands, or are about to do so. There is Chepstow Castle, which belongs to the Duke of Beaufort and is one of the five Norman castles built during the reign of William the Conquerer. Then there is Timber Court, Thames Ditton, formerly a favourite resort of King Charles. Another, Acton Castle, near Marazion, Cornwall, is to be transformed into a big hotel. It was built by a wealthy crank called John Stackhouse about 1775 for the express purpose of studying seaweed.

Restoration of a Cornish Well-Chapel.—The re-dedication of the restored Well-Chapel of St. Clether, was performed last week. The chapel, which had long been in ruins, was situated in a bog, and last year, when the castle was cleared away, suddenly the water resumed its old course and flowed by a subterranean channel under the east wall, bubbled up beneath the altar, and then was carried away by a second subterranean conduit into the second holy well. The chapel has been completely restored. Almost all the old stones were found.

Munificent Gift to a London Hospital.—The Governors of the London Hospital have received £60,000 from the executors of the late Baroness de Stern towards the establishment of a convalescent home.

The Arts and Crafts Exhibition will be open for two months from October 9th. The south room of the New Gallery will be devoted entirely to specimens illustrating the work of the society's late president, Mr. William Morris.

The Cromwell Statue at Westminster will be unveiled on October 31st. A committee is being formed to make preparations for a national demonstration on the same evening. Lord Rosebery has consented to speak on this occasion.

Accident at Dover Harbour Works.—On Wednesday a man named Edward Albert Knowles had charge of some blasting operations at a considerable height on the cliffs. It is stated that he gave the order to fire the explosive before he was clear, and when the explosion took place he was blown down the cliff and killed.

A Disastrous Fire at a Sheffield Engineering Works, belonging to Walker and Eaton, adjoining the Great Central Railway, occurred on Saturday, September 16th. The outbreak originated in the pattern works, and spread so rapidly that before the fire brigade arrived a large block was in flames. The total destruction of the works was prevented, but damage was caused to the extent of about £10,000.

A Fatal Accident occurred on September 18th at the excavation works in the Mile End Road in connection with the Whitechapel and Bow Railway. A staging of planks supported by heavy timber trestles, which was used for carts to back up to for loading and unloading purposes, suddenly collapsed, and Michael Flynn, a labourer, who was underneath at the time, was crushed by the falling timber. Death was instantaneous.

Improvements at Scarborough.—It is proposed to construct a new reservoir on Spring Hill, with a capacity of 3,000,000 gallons, for the supply of Falsgrave. The estimated cost is £8,500. New footpaths are to be laid out in St. Nicholas Gardens at a cost of £964, trees and shrubs are to be planted in various parts of the borough, the castle, dykes, and holms are to be improved, and it is proposed to construct a tramway down to the North Cliff near the pier.

The Comparative Breaking Strength of Concrete Slabs made with, and others made without, the addition of expanded metal was tested before a large number of gentlemen at the Gallowgate Ironworks, Newcastle-on-Tyne, on Monday, last week. The experiments were continued on the following day, and a sub-committee, which was appointed by a joint meeting of several representative local bodies, is drawing up a report showing the relative breaking strain of the two kinds of concrete.

A New Central Park at Ilford, which has just been opened, comprises forty-seven acres, and has a large lake in addition to the usual flower beds and shrubberies. The £12,000 which has been borrowed from the Local Government Board for the acquisition of the park was lent for the longest possible period—fifty years, so that the rates will be increased by only a very small amount. Councillor Griggs, Chairman of the Parks Committee has presented a drinking fountain to the Council.

The Excavations at Thermos, the ancient place of assembly of the Ætolians, are being carried out under the superintendence of M. Sotiriades, who reports that he has discovered an edifice decorated with painted metopes, on which are inscriptions pointing to figures of the Graces and of the goddess Iris. These are in terra cotta, and resemble the antique statuettes found in Sicily. There is also a fountain, with important inscriptions bearing on the history of Ætolia. Lastly, M. Sotiriades has discovered traces of an ancient city near Thermos, the walls of which were three mètres in extent, and are well preserved.

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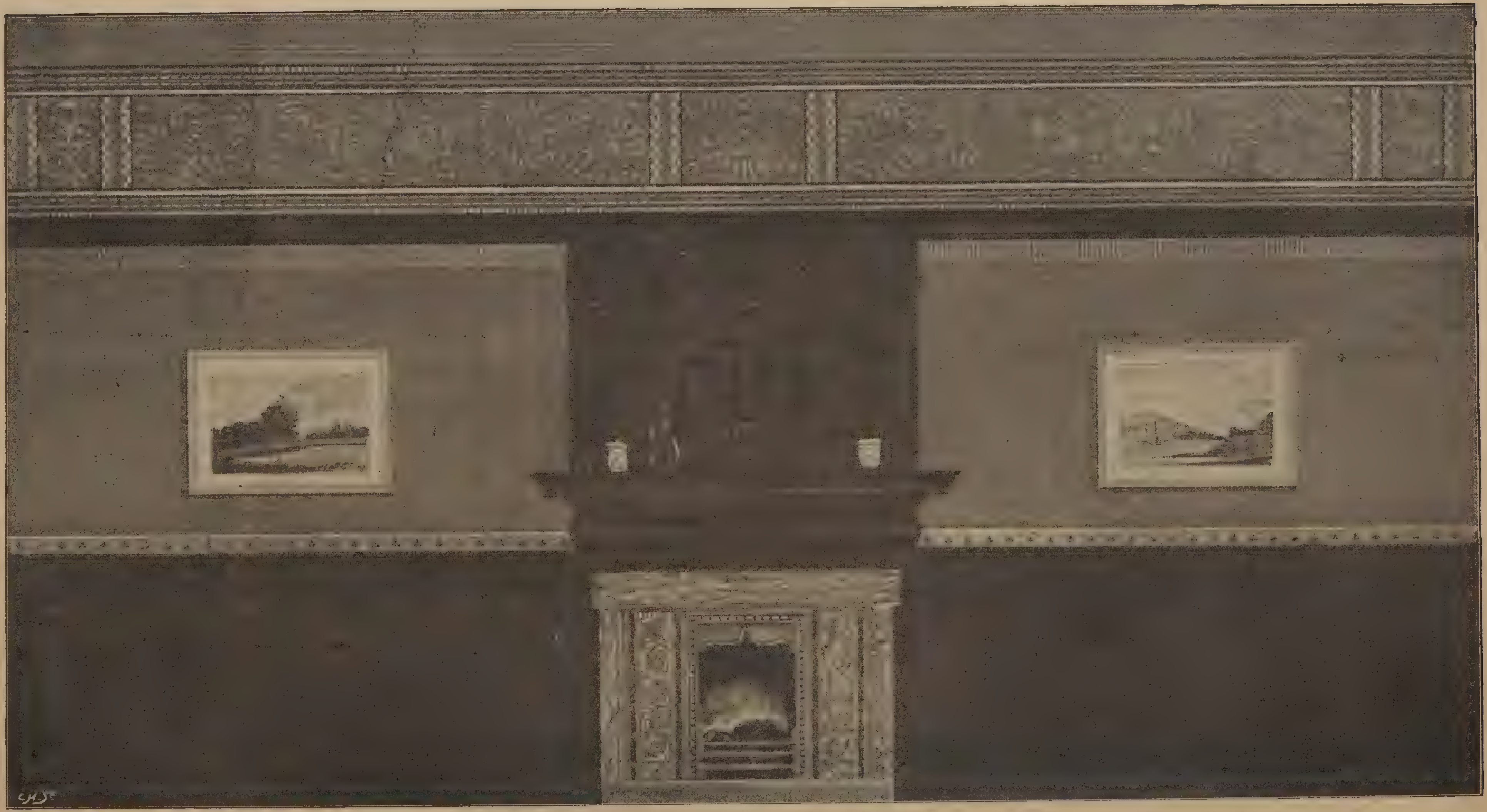
SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, WEDNESDAY, SEPTEMBER 27, 1899.



DECORATION OF DINING ROOM, THE BOLTONS, KENSINGTON. By Cole A. Adams.

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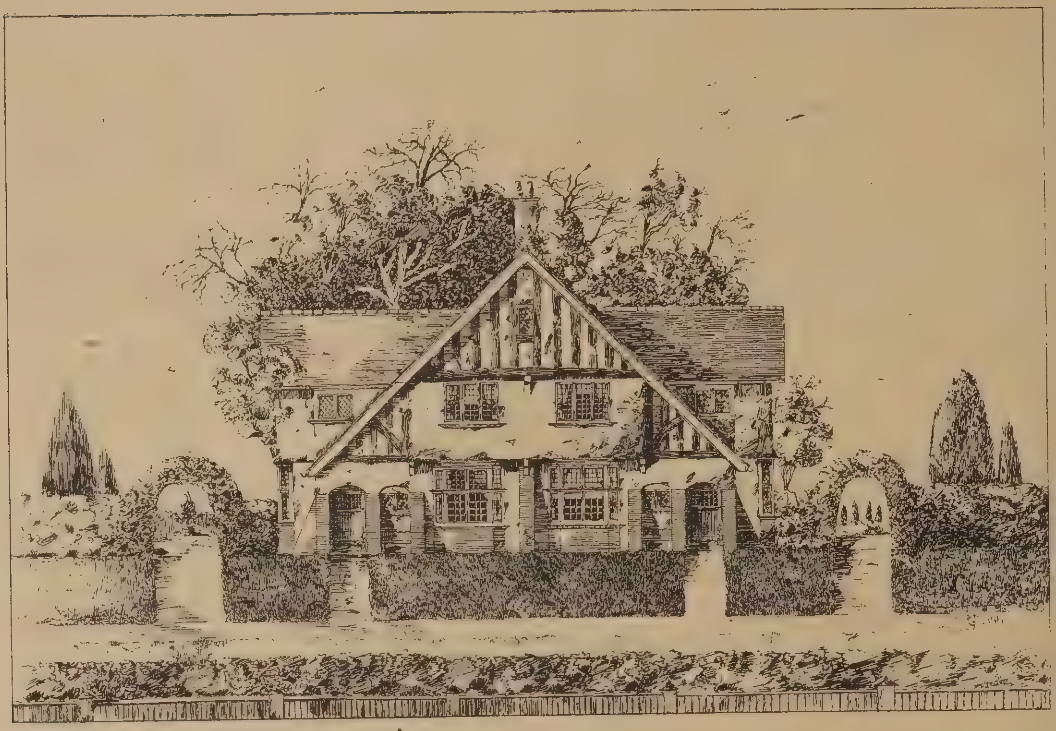
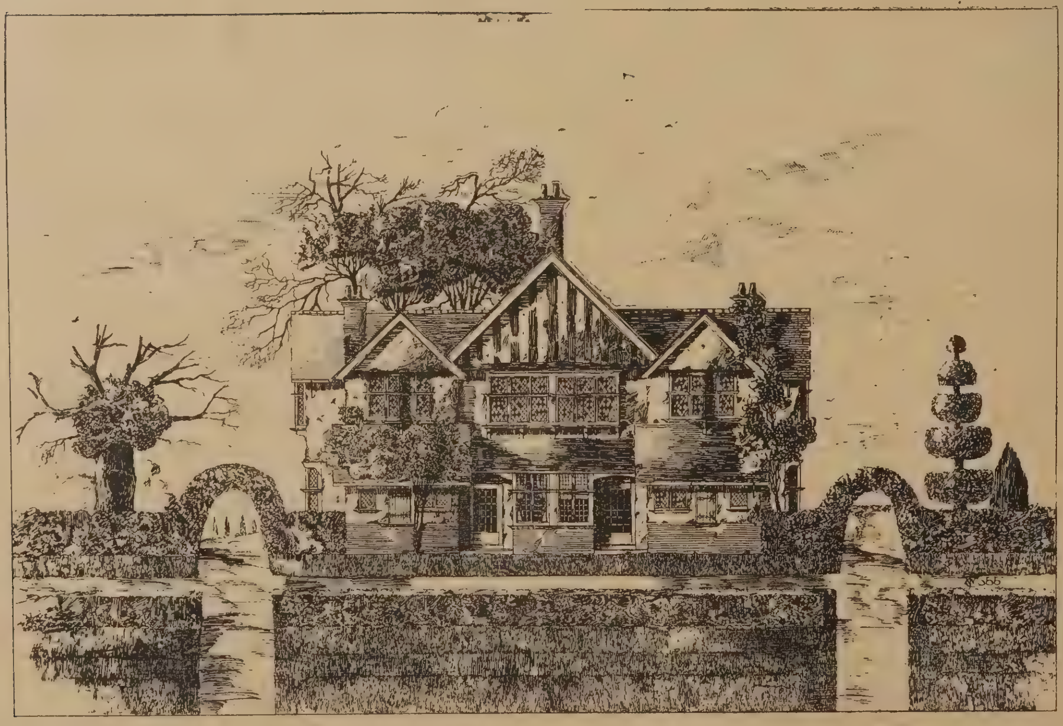
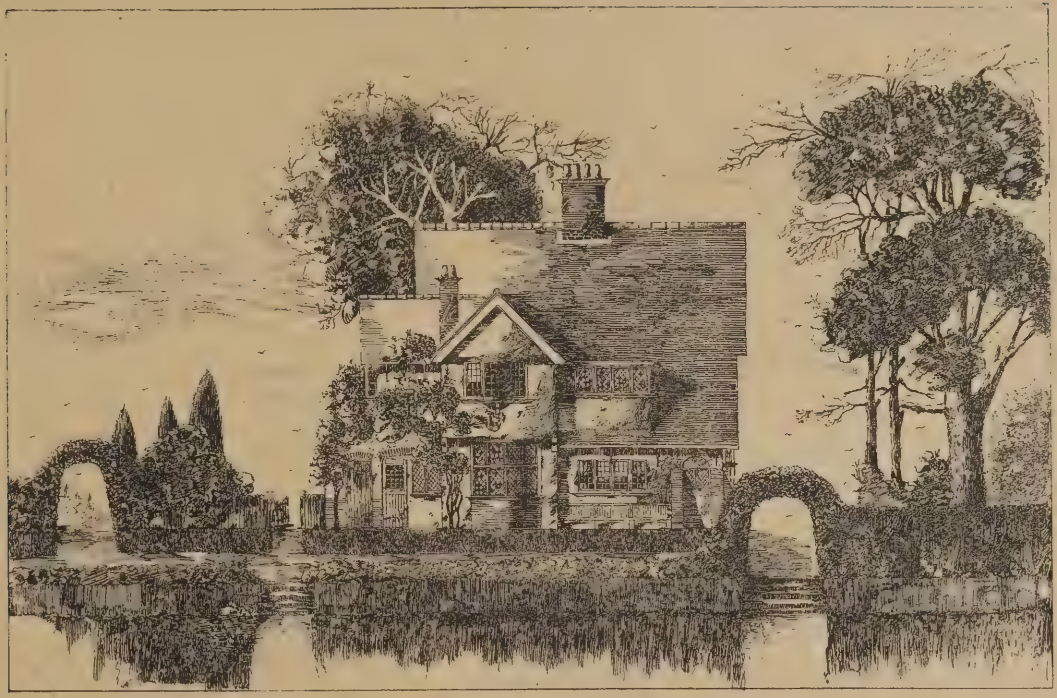
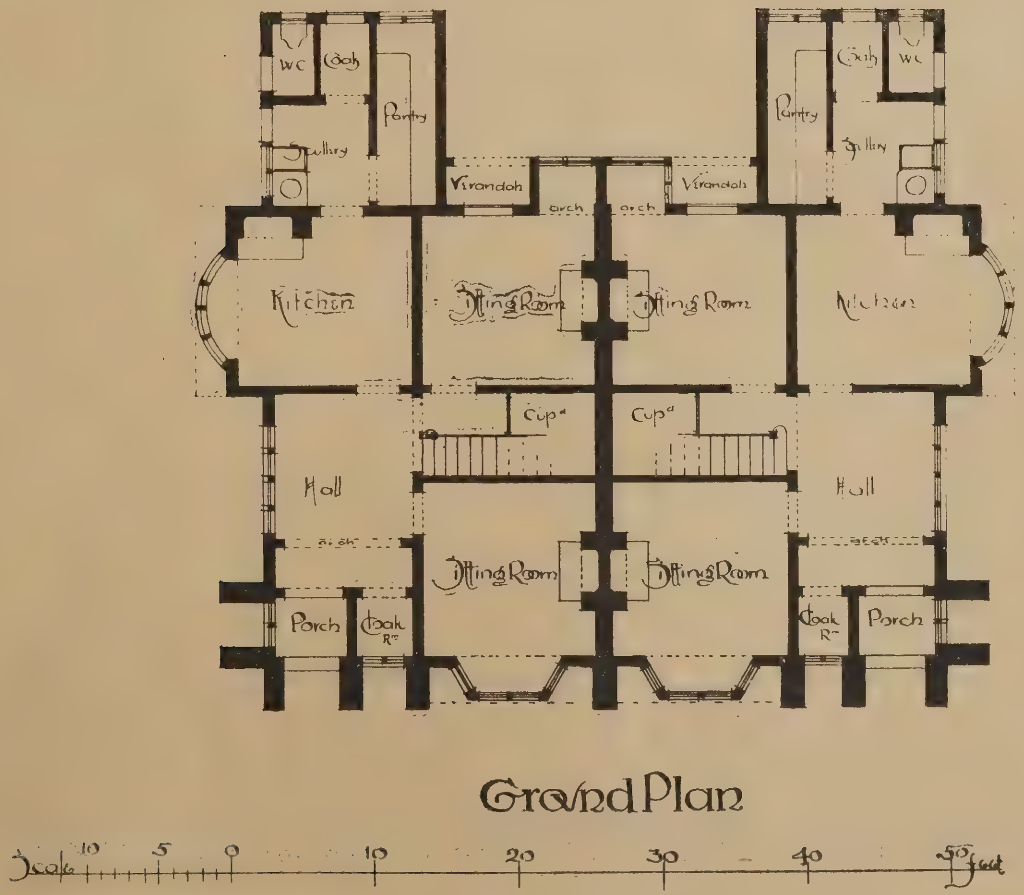




A PAIR OF SMALL HOUSES AT WHIT





PARK, MIDDLESEX. J. W. COBB, ARCHITECT.

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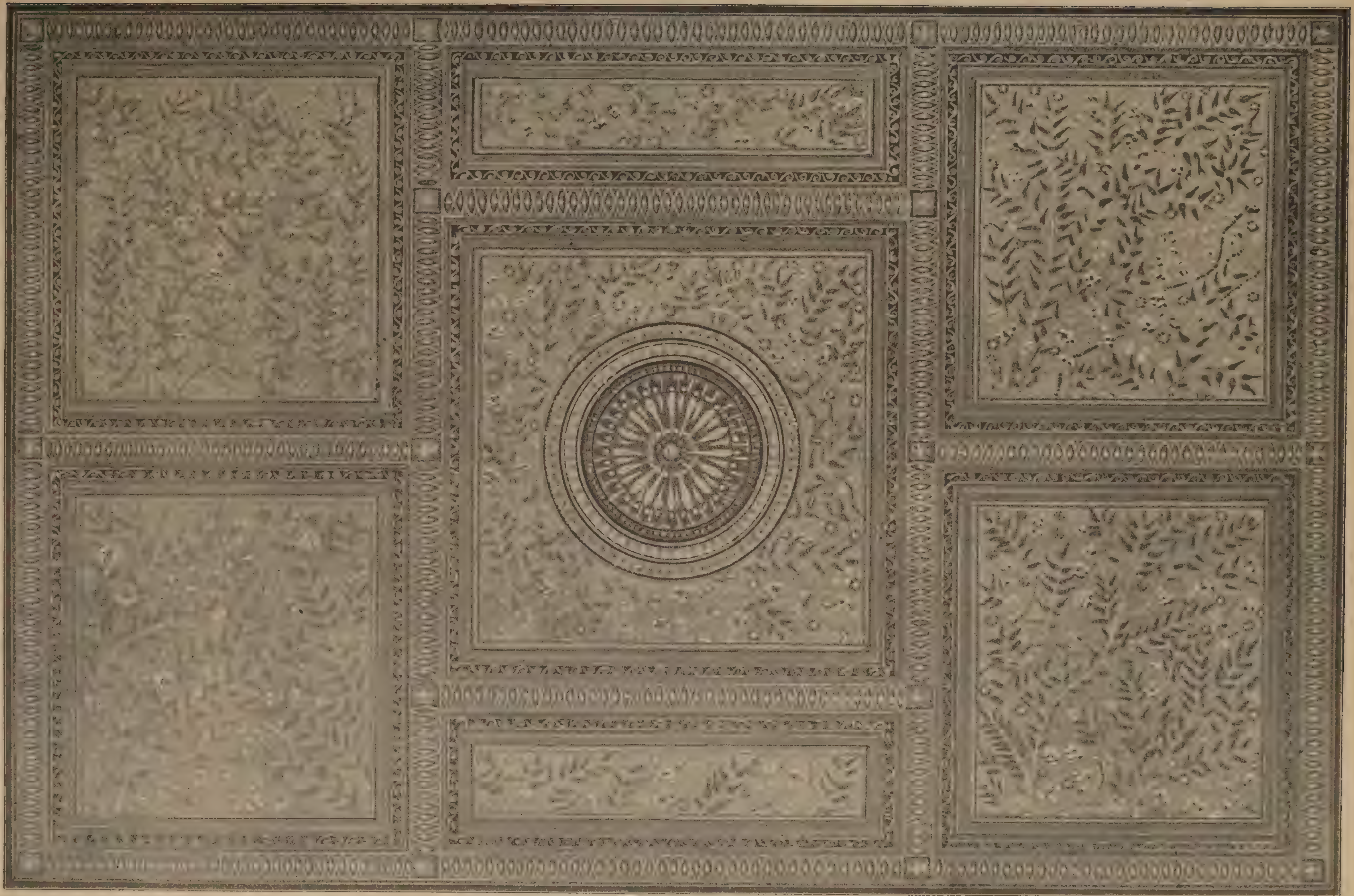

A BOUDOIR CEILING. BY COLE A. ADAMS.

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WITH GREEK BUILDERS.

By JOHN A. MARSHALL.

(Continued from page 84, No. CCXL.)

IV.—THE ERECTHEION.

"Mighty, indeed, are these figures! these limbs, how gracefully rounded!"—Goethe.

After the formal severity of the Propylæa, the student may not be unwilling to turn his attention to the effeminate beauties of the Erectheion—some twenty years younger than the Periclean epoch.

Much of the original work from this building is in the British Museum, including an inscription relating to the construction, and describing some of the very stones to be seen in the Museum. Another inscription, containing the building accounts, has also been found, and though both inscriptions are fragmentary, yet, thanks to numerous learned commentators, a great deal has been made clear, and another phase of the architectural practice of the Greeks has been opened out for us.

The student is no doubt familiar with the plan of the building, and respecting the purpose of its singular disposition it will suffice to regard the edifice as the shrine of several ancient cults, for which distinct apartments had to be provided or incorporated.

The site is bounded on the south and east by a terrace, 10ft. in height, which once served as the basement of an ancient temple. The walls of the Erectheion are carried up from the rock of the lower level, but the floor and entrance of the eastern apartment were on the level of the terrace, and this portion of the building was probably entirely shut off from the rest, but there is nothing to show what the division walls were like.

The north portico, on the low level, is of unusual proportions; it was utilised as a sanctuary, and by the side of the main entrance is a small doorway, which led into an open court.

The south wall of the main building, at its western end, is kept a few feet clear of the stylobate of the ancient temple, and advantage is taken of the gap thus left to insert a small staircase leading down from the terrace to the western compartment, and thence through a small doorway in the west wall to the open court before mentioned. It was, perhaps, to the necessity of inclosing this staircase that we owe that gem of Grecian art, the Caryatid porch which is bridged over the gap, and transforms what would otherwise have been an uninteresting stretch of plain walling into a charming composition.

At the north-east angle the difference in the levels of the ground was met by a wide flight of steps.

Taken as a whole, the arrangement of the building may be described as picturesque, while breadth and mass were ensured by the unbroken continuity of the main roof.

The spaces between the columns on the west wall were originally left open, excepting for a height of 4ft. 6in. above the bases. At this level a recess or niche is formed in the south wall just inside the building, and this recess—it has been conjectured—contained some object intended to be seen from the court.

The filling in and the windows, existing in the last century, were Roman alterations, although, from the condition of the anta at the northern end of the west wall, it has been thought probable that the filling in of this particular intercolumniation was part of the original design. Mr. Schultz has suggested, with some probability, that alterations were made to the building in late Greek times—say, the second century B.C.—especially to the large north doorway.

In the year 409 B.C., when the building was nearing completion, it was decreed by the people that the epistatæ, appointed to superintend the erection, should draw up a report enumerating the works which remained to be done. It is this report which is in the British Museum. The other inscription referred to above contains some of the building accounts rendered by the epistatæ to the treasurers of Athene, B.C. 408 or 407, when probably the building was completed, or nearly so. From these accounts we learn that the workmen engaged were of two classes, day labourers and those on piecework. The former included stone sawyers, carpenters, labourers, and the men who put up and took down the scaffolding. All these were paid at the rate of a drachma a day (9½d.). Of the latter class are mentioned the sculptors of the frieze and those engaged in fluting the columns.

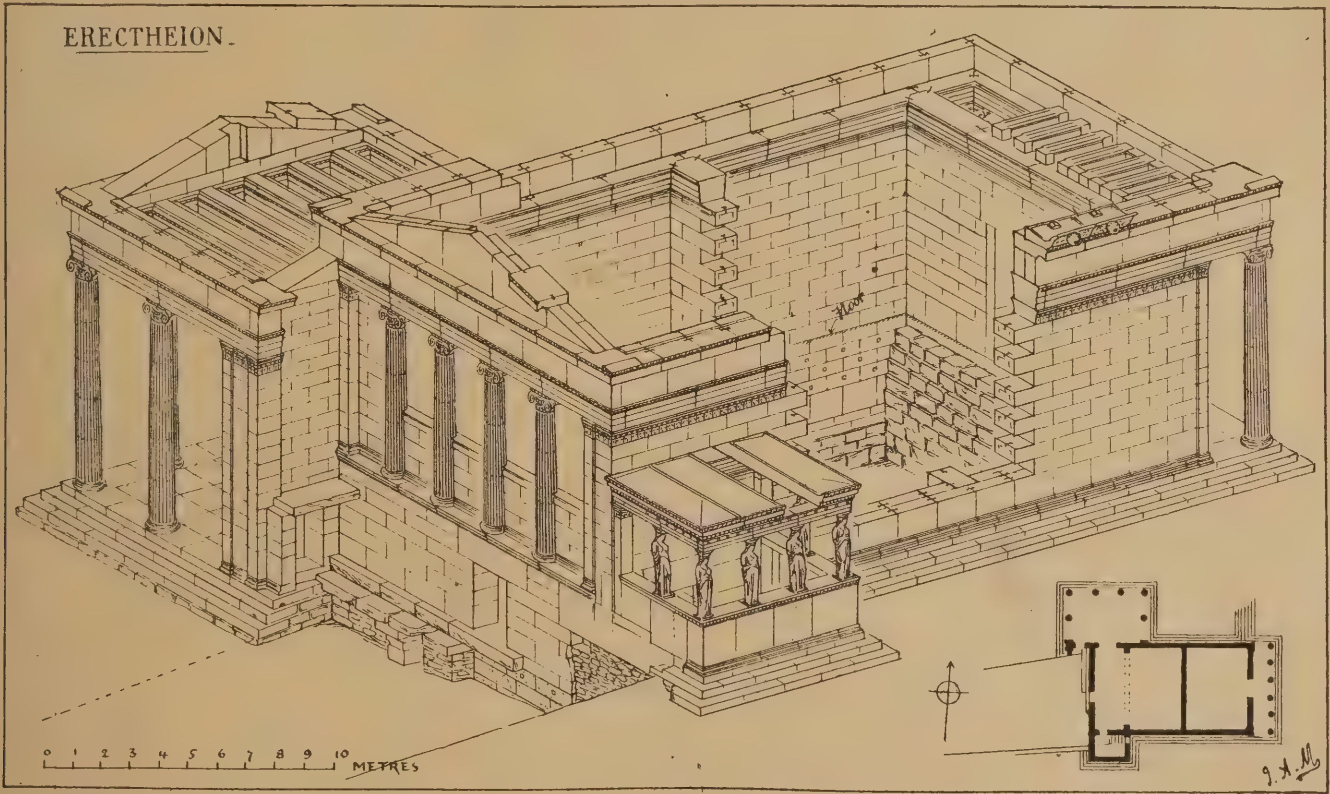
It is evident from these accounts that at this time there was no general contractor, the epistatæ dealing directly with the workman, but we cannot say whether this had been the arrangement from the commencement of the works, or only towards the close. The accounts for one prytany only (thirty-five days) are practically complete, the rest being fragmentary, so that the length of time covered cannot be determined, but it is probable, from the nature of the items, that these payments were only for work executed after the report furnished by the epistatæ in 409 B.C.

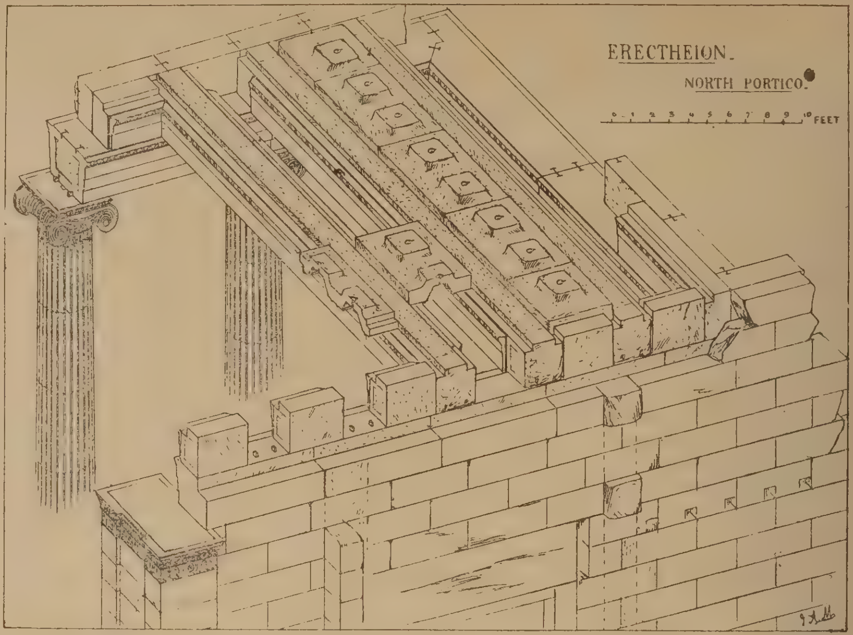
This report gives the size and condition of every stone that was being worked, or that was not placed in position; it also specifies the fluting, carving, and polishing that remained to be done.

Although the list of items is incomplete, it is clear that, at the time of the survey, the building was well advanced; the north and south porticoes were nearly finished, and some of the stones of the frieze were in position. This height was not, however, attained all round, for at the south-west angle, over the Caryatid porch, the work seems to have been kept down a few feet.

It is here the report begins, with a list of No. 5 plain walling blocks, "not placed" (see Fig. 1, p. 121). One of these was a corner stone, with part of the anta worked on (Fig. 2). The ordinary walling blocks are stated to be 4ft. long, 2ft. wide, and 1ft. 6in. high. These agree with the actual dimensions. There are also No. 5 stones 4ft. long, 3ft. wide, and 1ft. 6in. high, for the enriched course under the architrave (Fig. 3); also a corner stone of this course, with cap of anta worked on (Fig. 4). These stones passed through the wall and were moulded on both sides. In the Museum may be seen the sliced-off fronts of four stones, including a corner stone, apparently from the north-east angle of the north wall (Fig. 5). Then follow No. 5 epistylia, or architrave blocks, 8ft. long, 2ft. 3in. wide, and 2ft. high, "not placed" (Fig. 6). The architraves passed through the wall, and were enriched with a cymatium on both sides; the inner cymatium was not carved, and was worked in places on a separate stone, let into a rebate, and clamped to the architrave. Thus one item runs: "The cymatium of the 8ft. length of architrave on the inside of south wall has to be added." The sliced-off front of an architrave is in the Museum.

The following items are described as "not polished," or "smoothed off":—No. 3 epistylia, the south wall, the orthostatæ all round the building, the three steps forming the base or stylobate, and the upper surface of the roof stones of the caryatid porch.





The following are stated to be "not fluted":—The columns of the north and east porticoes, the upper torus of the base mould all round the building, and on the bases of the columns (Fig. 7).

The carving had to be done to the necking of a column on the west wall (Fig. 8), and to the architrave of the Caryatid porch. The rosettes on this architrave are still in block.

A peculiarity in the arrangement of the orthostatæ—due to the difference in the levels—may be noted here. In the western apartment, the orthostata of the north wall is repeated at the same level on the south side, although concealed on the exterior by the terrace; and on the same side, but 10ft. higher, is another deep band, the stones of which appear outside, but pass only halfway through the wall, so that they could be backed with stones made to range with the ordinary walling blocks inside (Fig. 10).

The moulded base stones under the orthostatæ, outside, are worked in two ways: for the north wall the upper fluted torus is worked on the base stones with the rest of the mouldings, but on the south side it is worked on the orthostata (Figs 9 and 10).

The "finishing-off" which remained to be done to the top of the Caryatid porch probably included the "weathering" of the stones, and the forming of raised rims or rolls along the joints to throw off the water, which eventually passed through the pierced cymatium of the cornice. This roof is formed of four stones, each 12ft. by 5ft., let into the wall at the back, and resting on the architrave in front, which is supported on the well-known architectonic figures; on the underside the stones are deeply coffered.

The construction in relation to this porch has been a never-ending source of discussion for archæologists. On the west, both the porch and the angle of the main building are supported on a huge lintel, 14ft. 9in. long, 4ft. 9in. high, and 2ft. thick, so as to be quite independent of the ground at the south-west angle of the court, as though some other building or shrine once occupied this position, and had to be maintained during the erection of the present building. Another singularity is that the porch is merely placed against the main building, not bonded to it, with the exception of the roof stones; these stones, however, do not bond accurately with the walling blocks, and, on the west, the profile of the cornice projects beyond the main building and is cut off square. The pilasters are monoliths, placed against the wall. On the west side of the porch—where the base moulding stops—there are indications of a parapet wall, which protected the terrace on the south from the open court below. The court was also inclosed by a wall on the north. A drain from the south-west corner of the court discharged through the steps of the north portico, just outside the wall; this drain may have carried off the water which found its way into the Caryatid porch, or, possibly, through the openings of the west wall, but these latter were, perhaps, filled in with trellis work.

Just inside the west wall, under the floor, a cistern—supposed to be coeval with the building—is hollowed out of the rock, but it is impossible to say with certainty how it was supplied.

We will now return to the "accounts." At the time of the survey the fluting had not been done to the columns of the north and east porticoes, nor to the upper torus of the moulded bases; this was evidently reserved, like the carving, as a "finishing off" process. From the building accounts we learn that, in fluting the columns, each column was assigned to a gang of five, six, or seven men, working under an overseer. The gangs were paid at the termination of each prytany, or every thirty-five days, and according to the number of drums completed, which seems to have generally been two. The pay per gang during a prytany differed but little. This may be accounted for by assuming that any fraction of a drum which might be worked, in addition to the two completed ones, was not paid for at the same time. For fluting two drums during one prytany, the gang of six men received 192 drachmæ, and the total cost of fluting one column has been calculated to amount to 400 drachmæ. The amount of the pay to each gang would, probably, also be affected by the length and diameter of the sections or drums, and by the termination of the flutings at the top and bottom of the column. The column from the east portico (in the Museum) is 20ft. in height, excluding cap and base; it is built up in four sections, diminishing in diameter from 2ft. 3in. at the bottom to 1ft. 11in. at the top. The columns of the north portico are 22ft. in height, in not less than five sections, 2ft. 9in. in diameter at the bottom, and 2ft. 3in. at the top.

Respecting the fluting on the torus of the base of Ionic columns, it is evident that, although this was not generally finished until near the completion of the building, yet when the torus was large and worked on a separate stone—as in the archaic type—it was necessary to finish two or three flutes at the bottom before the stone was placed, as they are so deeply undercut that it would be impossible to work them *in situ*. In the Museum there is an unfinished torus from the archaic temple at Ephesus which is quite plain, with the exception of two flutes on the under side. The fragment of a base from the Mausoleum has two flutes unworked in the middle of the torus, but the inscribed lines for the fillets can be clearly traced on the unfinished part.

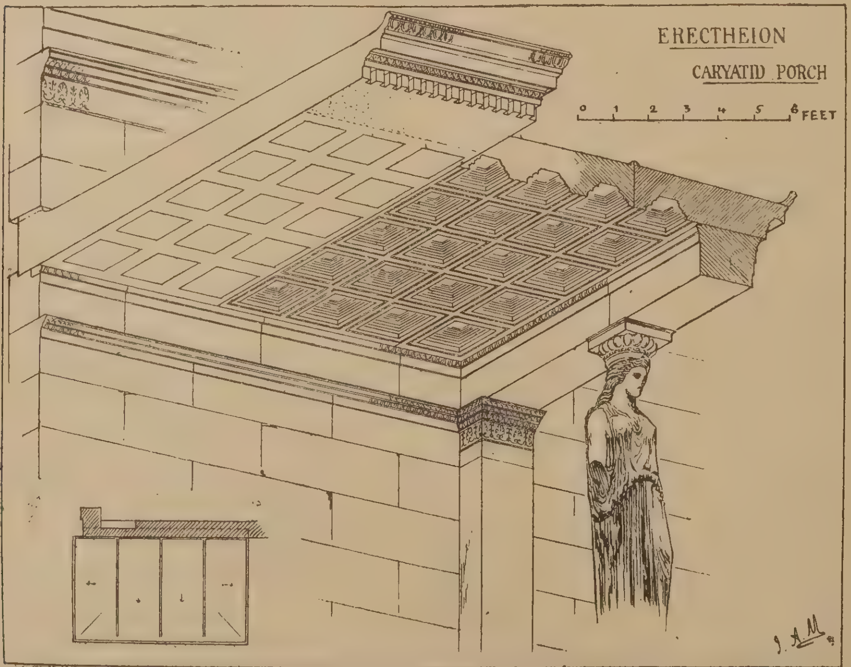
The frieze all round the Erectheion, and the tympana of the east and west pediments were in two thicknesses, the outer facing being of dark limestone from Eleusis.

This served as a background for the sculpture in white marble, which was clamped to it. The figures were worked in separate pieces, without a background, and flat at the back, for fixing against the slabs. They were about 2ft. in height, and a few fragments have been identified. In the accounts there are several sums paid to the sculptors, the prices for single figures ranging from 120 drachmæ to half that amount. A group of three figures cost 240 drachmæ. There is also an item: For the purchase of lead for fixing the figures of the frieze, 10 drachmæ; and, for the purchase of gold (two leaves) for gilding the eyes of a column, 2 drachmæ.

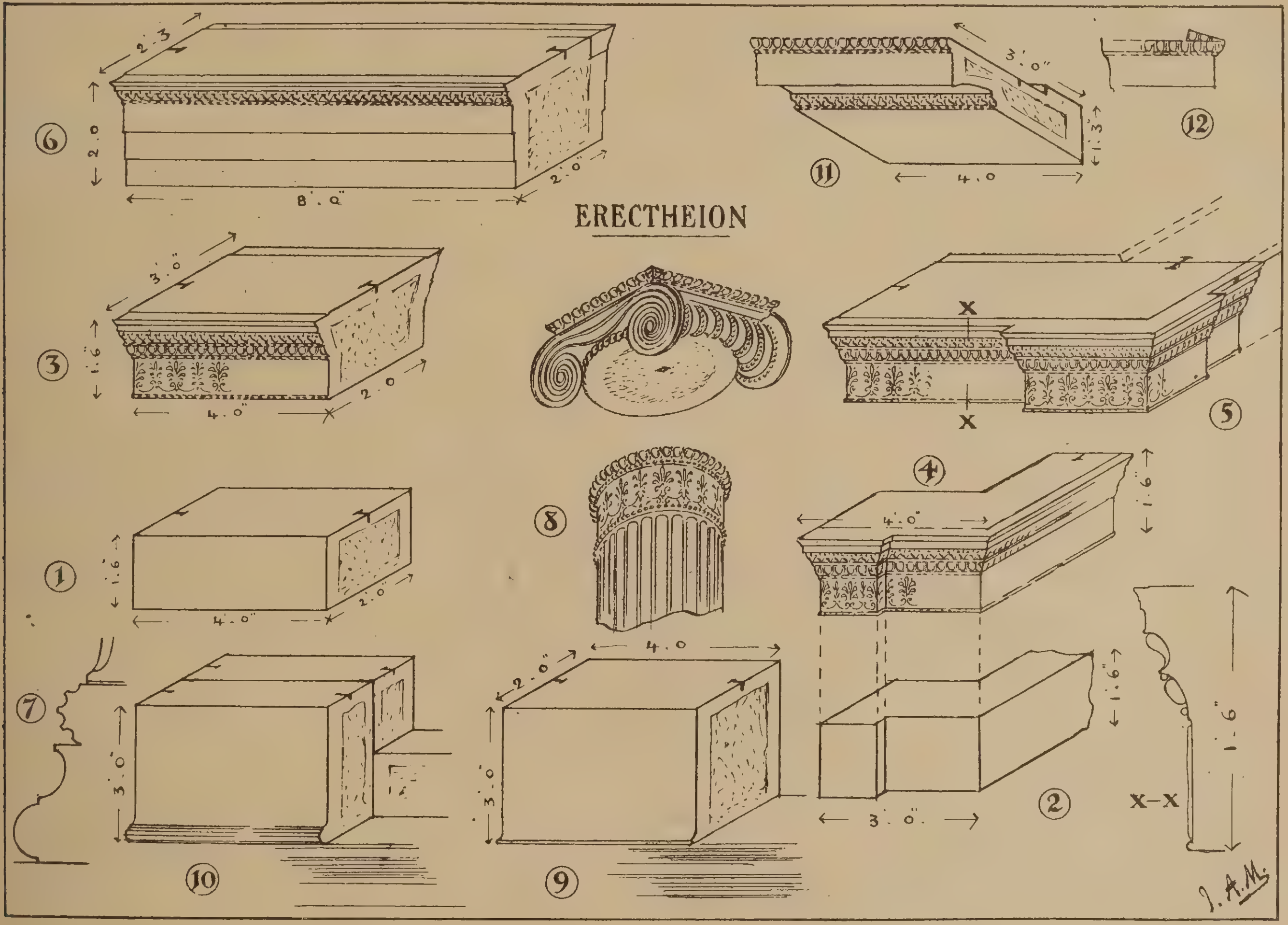
The carpenters were also very busy putting together the roofs and ceilings.

Having now arrived at the level of the frieze, we will continue our examination of the building with the help of the "report."

Several stones 2ft. wide, 1ft. thick, and from 4ft. to 6ft. in length, are given, of each of which it is stated that "the alternate joint is not worked, nor the back joint." The heading



of this list is missing—the inscription being broken at this part—but it has been held that the items refer either to the backing stones of the frieze or to the stones of the eaves gutter. The width and thickness are exactly suited to the frieze, and the difference of length is what we should expect for backing stones which were not seen. Another reason for associating these stones with the frieze is, that they immediately precede a list of stones for the corona, or cornice. According to Böckh, the alternate joint was at one end of each stone, where the sinking for the metal clamp was left to be worked *in situ*, to ensure accurate adjustment, while the back joint had to be notched for the ends of the ceiling beams, which probably rested on the architrave course. Others have thought that these joints refer respectively to the raised rims on the sides and back of the stones forming the eaves gutter, and that they were left for adjustment *in situ*. We are not aware if any of the gutter stones for this building have been found, although there is, we believe, an anthemion, from a cover tile, in the Museum.



The list of stones for the corona surmounting the frieze and the tympana of the east and west pediments, appears to be complete; but it will suffice to give one or two of the items as examples:—

"No. 7. stones of the corona (for the eaves), 4ft. long, 3ft. wide, and 1ft. 3in. thick, blocked out smooth, but not carved."

"Of two others, not carved, of the cymatium 4ft., and of the astragalus 8ft." One of these stones is in the Museum (Fig 11), and it will be seen that it is enriched with an upper and a lower cymatium, each associated with an astragalus: it follows therefore that a stone 4ft. long would have a total run of 8ft. of cymatium and 8ft. of astragalus. "Two corner stones for the east portico, 6ft. long, 3ft. 6in. wide, and 1ft. 3in. thick; of these, one was finished off smooth, but the whole of the cymatium and astragalus was unworked."

"The stones of the (horizontal) corona for the east and west pediments, 4ft. 6in. long, 2ft. 6in. wide, and 1ft. thick, one of these worked smooth and another with the smooth work half finished."

The corona stones for the eaves were 1ft. 3in. thick, but notched or rebated in front for the gutter stones.

The horizontal cornice under the pediments was, however, only 1ft. thick; but the angle stones for same were 1ft. 3in. thick, because they comprised a small portion of the inclined cornice (Fig. 12). The pediment of the north portico was completed at the time of the survey, and it may be noted that its tympanum had no facing of dark Eleusinian stone, but consisted of three solid blocks of marble 2ft. thick; the centre piece—7ft. long—was notched for the ridge of the roof; the side stones were each 10ft. long.

Some backing stones for the east and west pediments are stated in the report to be only half worked; in fact, they had not apparently been cut to the raking lines of the tympanum, as they are all one height, viz., 3ft. 6in., and 1ft. thick.

The roof timbers of the north portico were, it is stated, "not placed."

We have now gone through the more important items, and must conclude our description from the remains of the building itself. None of the stones mentioned in the inscription seem to belong to the ceilings of the north and east porticoes, and these were probably finished; although, of course, it is impossible to say what was contained in the missing portion of the inscription.

The ceiling of the north portico comes next in importance to that of the Propylæa. The beams, which have a bearing of 19ft., are about 2ft. square, and are arranged over the columns and over the centre of each intercolumination. This agreement with the divisions of the peristyle was almost necessary in Ionic buildings, where the ceiling beams rest either immediately on the architrave, or are notched on to it. Being so closely associated, any disparity in the spacing out of the columns and the ceiling beams would be unpleasant.

The beams are about 3ft. apart, and the top edges are rebated for the lacunaria stones, with a sub-sinking along the top of the moulding to relieve the latter of the weight. As usual, the mouldings and facia are mitred at the ends for the return blocks on the walls. The lacunaria stones are deeply coffered, and to reduce the weight, the top is roughly cut away around each coffer. At the joints the stones are rebated to overlap; thus each stone had a bearing on three sides, which reduced the risk of falling in case of fracture.

An astragalus around the coffers concealed the transverse joints on the soffit, and the panel of each coffer was enriched with a bronze patera, secured by a bolt, which passed through the stone and was keyed at the top. A lacunaria stone from this portico is in the Museum, but, unfortunately, the upper surface is embedded in the wall against which it is placed.

A fragment, supposed to belong to the ceiling of the east portico, is in a wall case in the same room; the coffer, which is pierced through the stone, was covered by a separate slab, probably to facilitate the carving of the egg and tongue enrichment around the opening. For the north and south porticoes the coffers and panels were worked out of the same stone, but the mouldings were not carved, only decorated in colour.

(To be continued.)

Erratum.—In the last article of this series the word "gutter" in the middle of the first column of page 83 should read "guttæ."

Huddersfield's New Drill Hall.—The whole of the tenders for the erection of this hall have been secured by Huddersfield firms. The estimated cost of the building, including new streets, heating apparatus, furnishing, &c., is about £7,500.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"But when I heare our Architects mouthing those big and ratling words of Pilasters, Architraves, Cornixes, Frontispieces, Corinthian and Dorike works, and such-like fustian-terms of theirs, I cannot let my wandering imagination from a sodaine apprehension of Apollodonius his pallace, and I find by effect that they are the seely and decayed peeces of my kitchen-doore."—MONTAIGNE.

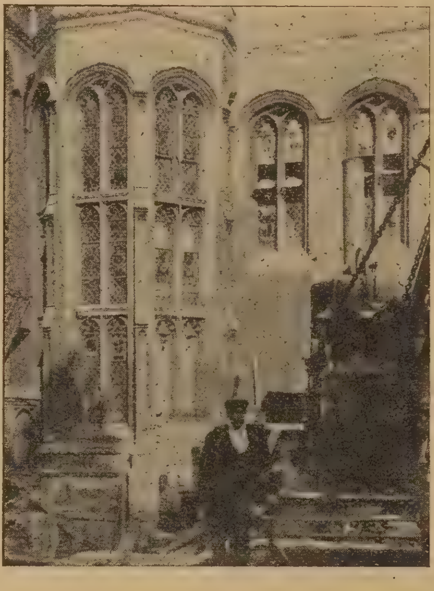
A Pair of Semi-Detached Houses THE plans and elevations, illustrated in one of our supplement plates this week, of the pair of semi-detached houses at Whitton Park, Middlesex, speak for themselves; but it may be added that the materials consist of red facing bricks wherever brickwork is exposed, but with the exception of the buttresses, bases to bays, and plinth to back lean-to buildings, the entire walls are built with stocks and covered with white rough cast. The outside timbering where shown will be tarred black with gas tar. The whole of the windows are glazed in leaded lights. The architect is Mr. J. W. Cobb, of 121, Blenheim Crescent, Notting Hill, London, W. The estate upon which these houses are to be erected is a very beautiful one, its natural advantages being perhaps almost unique in a building estate so near London, being only fourteen miles from Waterloo. One feature of the estate, especially, may be mentioned. The old mansion, with lake and about 30 acres of beautifully-timbered land, is proposed to be left intact and used as a club and recreation ground.

Accident to a Steeplejack. ON September 16th an inquest was held on the body of Martin Gallagher, a Liverpool steeplejack, who was killed at the Hardshaw Brook Chemical Works on the previous Thursday. Thomas Massey, another steeplejack, said that the chimney was originally 140ft. high, but by the day in question he and deceased had got half of it down. They should have started work at six o'clock on that day, but Gallagher said he did not feel fit for climbing, and went back again. They arranged to start work at one o'clock. Gallagher was then quite sober, and nothing, apparently, was the matter with him. He first climbed the chimney by means of a ladder, and then, sitting across the top of the chimney, handed the top ladder to witness, who was outside the chimney on the ascending ladder. Witness lashed the ladder again, and shortly afterwards a boy at the bottom shouted, "Martin has gone." Witness knew what that meant, and went down. He found Gallagher lying at the bottom of the inside of the chimney. Some loose bricks in the flue were removed, and Gallagher was pulled out. He was unconscious, and was afterwards removed to a hospital, where he died. Witness could not say how Gallagher fell from the top of the chimney, unless he in some way missed his footing. He was a practical man, and well understood the business.—A verdict of "Accidental death" was returned.

Mutilating Monuments. THE life of a prominent man is hardly ever free from some fierce attacks, but it certainly does seem hard that his monument should not be allowed to remain in peace. Some persons at Hughenden, however, think otherwise, for they have just been further mutilating the monument erected, in a somewhat lonely spot near Tinker's Wood, to Mr. Isaac Disraeli, father of Lord Beaconsfield. This time knives have been used. On a former occasion the monument was described at the Hughenden Parish Council as a target for mischievous stone-throwers. Unless some attempt is made to prevent further mischief being done, we are afraid that the monument will, one day, be entirely demolished.

The French Embassy in London. ALTERATIONS to the French Embassy, Albert Gate, W., are now in progress, and will effect a considerable enlargement to what is already the most imposing Embassy in London. Some houses are being demolished on the eastern side, where the Church of the Holy Trinity stands—a church which is often a source of curiosity on account of its having a public-house on each side. The two huge buildings which flank Albert Gate are more notable, as regards the exterior, for their bulk than for their beauty. Like many another palatial mansion in London, their grandeur is solely within. Built in 1846, they were popularly known as "the two Gibraltars," because it was thought that they "could never be taken." However, although "Gib" has hitherto remained impregnable, these immense buildings were not so long in finding tenants. That which has long been the French Embassy was first occupied by Hudson, ex-draper and railway millionaire. When the railway king's financial crash came the French Government took the house over.

Crosby Hall. THE demolition of some buildings in Bishopsgate Street, E.C., has exposed to view the part of Crosby Hall shown in our illustration. It is a good specimen of Perpendicular Architecture, and was built in 1466 by Sir John Crosby, alderman and M.P. for London. This historic hall is one of the few examples of domestic Architecture of its day which have survived the ravages of "improvement," and the disastrous fires which have periodically laid waste our ancient City. It was occupied by Richard of Gloucester, afterwards Richard III., and is the place where he planned the deposition and death of his nephew, and where Lady Anne awaited his return from Henry VI.'s funeral, as described in Shakespeare's "Richard III." It is also said that Sir Thomas More wrote his "Life of Richard III." when residing under this roof. Crosby Palace was subsequently owned by Sir John Spencer, the wealthy Lord Mayor of London, whose daughter, married to the Earl of Northampton, was one of the greatest heiresses in the kingdom, living here in luxurious style. The Countess of Pembroke, "Sidney's sister," spent part of her life within these walls. The palace subsequently became a Presbyterian conventicle. From that it sank in the social scale to a warehouse, and has finally been converted into a restaurant, much in favour among City men.



CROSBY HALL, A HITHERTO CONCEALED PORTION.

A New Town. IN the Russian journal "Rossia" some particulars are given about the new town of Dalny, near Port Arthur, which the Russians intend to build. It will take the place of the small native villages which now partly surround the bay of Talienwan, some twenty miles from Port Arthur. Each of these villages consists of a dirty narrow street of badly built stone houses with straw roofs, in which the Russian troops are at present quartered. Among the larger buildings are two Buddhist temples, one of which is used as a military hospital, and the other as a place of meeting for the soldiers. Commanding the bay, but now in ruins, are the fortifications constructed by the Prussian colonel, von Hanncke. They consist of four forts. Talienwan is connected with Port Arthur by telephone and telegraph, and the post runs twice a week. The bay makes a satisfactory harbour, but the question arises whether it will not be necessary here, as at Port Arthur, to deepen the harbour on account of the large draught of some of the vessels. When Dalny is built Port Arthur will continue to be the administrative centre, but in commercial and industrial affairs Dalny will take the leading part. The majority of the wretched Chinese houses which stand on the site of the new town were abandoned by the inhabitants at the time of the Japanese occupation.

Luxuries in Water. THERE are some people who use too much water and some who use too little, and some who use it in an unauthorised manner. Three of the latter appeared at the Waltham Cross Petty Sessions on September 19th. Mr. Arthur Gill and the solicitor for the East London Waterworks Company attended to prosecute.—Mr. Gill stated that Section 72 of the Company's Act excluded water being used for gardens, fountains, or ornamental purposes of any kind when only the ordinary rate was paid, and should water be required for any other purpose it should be obtained by meter. That was a matter concerning which no person had a right to be ignorant, as on each demand note was a notice calling attention to the matter.—John Wallace, of Chingford, pleaded guilty to using water for non-domestic purposes.—Mr. Gill said that a fountain was attached to a fishpond on defendant's premises, through which the water came in considerable quantity by means of a sprinkler.—Defendant said there was only a small sprinkler attached to the fountain. The chairman remarked that this was a deliberate taking of the water, and in entire contravention of the conditions. Defendant would be fined 20s. and costs.

Glasgow Arcitectural Association. AT the opening meeting of the twenty-second session of this Association, held in the rooms, 187, Pitt Street, on the 19th inst., the President, Mr. John Fairweather, A.R.I.B.A., delivered his opening address on the Association and its work. Briefly reviewing the many changes which had taken place in the twenty-one years of its history, the President, while acknowledging the vast increase in the membership, had to complain of a proportionate decrease of interest taken in the Association by its members, draughtsmen, craftsmen, and juniors, particularly the latter, the very class for whose benefit the Association was originally instituted. He enumerated the various benefits to be derived from the Association, both architectural and social, and pointed out that if each member would come forward, join hands with the committee, and do his utmost as an individual to further the aims of the Association, there was no limit to the influence which it might effect as an educative body. At the conclusion of his address Mr. Fairweather was accorded a hearty vote of thanks.

Queen Elizabeth's Hunting Lodge. THE building known as Queen Elizabeth's Hunting Lodge, at Chingford, which for the past four years has been the home of the Epping Forest Museum, is now being restored by the Corporation of London, so as to provide increased accommodation for the Essex Field Club's exhibits. These will be thoroughly reorganised in the course of next year, when the collection will become a supplemental one to the new museum at Stratford, which is now being erected at a cost of about £9,000, in close proximity to the municipal technical buildings and library. Here will be placed the Essex Museum of Natural History of the Essex Field Club, and in all probability a collection of art objects lent by the City Corporation. On the ground floor is a large central hall, lighted from above, which will make an excellent room for the display of scientific and other objects.

The Panama Canal. THE Panama Canal is being continued by some American speculators. When some years ago the Panama scandals were divulged at the time of the trial of de Lesseps and some of his colleagues, everyone was talking of this gigantic engineering enterprise which had ended in a gigantic failure. But great as are the difficulties of cutting through an isthmus some thirty-five miles wide, and forming a navigable canal, owing to the local conditions, the canal might perhaps have been an accomplished fact ere this, says the "Morning Herald" had there not been gross carelessness, wastefulness, and fraud in the spending of the shareholders' money. In the end, when the old company went into liquidation, £74,000,000 had been expended, and only one-fifth of the work had been done. With the new Panama Canal Company came a system of economy and most careful supervision, and the results are very encouraging. Every appliance used in great excavations has been tested, and the results have been carefully recorded. The canal entrance from the Atlantic is from the Bay of Limon. The island of Manzanillo, the terminus of the Panama Railroad, known as Aspinwall, is on the left and east.

Some Points in Construction. INSIDE the breakwater, at the upper end of the island, is a vast basin, not yet completed, where wharves and dry docks are to be built. The first real obstacle was encountered near Colon, where much submarine mining was required; but this once passed the dredgers made their way to Gatun. It is here that the Chagres River is encountered for the first time as the canal enters the river. At the Obispo Valley the Chagres bends to the left, and it was at this point that a really serious difficulty was encountered. Where the canal line enters the valley of the Obispo, the Chagres becomes a powerful river, subject to sudden and dangerous increase in volume, and striking the canal at nearly a right angle. As the excavation demanded was nearly 80ft., a tremendous dam was projected to control the waters of the Chagres at Gamboa—a dam of such unheard of proportions that no two engineers could agree as to its details, as at that time a safe foundation had not been discovered. In order to gain time for further investigation, it was determined to adopt a system of locks, ten in number, all of which were in an advanced state at the time of the disaster, but have been since definitely abandoned in favour of the project of M. Godlin de Lepinay, who proposed to convert the interior of the isthmus into a vast artificial lake. This is now regarded as the key to the problem, and on this solution is based the definite project of the New Panama Canal Company, placing the bottom level of the canal at 68ft. above sea-level. It seems now not only possible, but probable, that in not so very many years the Panama Canal will be available for navigation. Enormous advantages to the whole commercial world will then be obtained.

A Hidden Picture. A CURIOUS picture has been discovered on the walls of the Suffolk Arms, at Winchester, a house till recently known as the "Marquis of Granby," under which name it has been licensed for about a century. It appears that the landlord was having one of the bedrooms repapered when he found under four layers of "hanging" an oil painting of a humorous character, which he has decided to leave uncovered for the inspection of visitors. The painting is 2½ft. by 3½ft., with a frame consisting of foliage with roses and the Prince of Wales's plumes, and the subject is a group of four seated figures all in the costumes of the reign of George II. or George III. They are represented as sitting in quaint chairs, smoking churchwardens, and for each there is a glass containing what is supposed to represent ale. On the table there is also a large pot, on which can be traced the word "King," and this, it is surmised, is the end of a loyal phrase. One of the figures is evidently that of a soldier, in a red coat, and with a wooden leg; another is a sailor, with a pigtail and blue dress; and the two others are believed to be a lawyer and a doctor. On the wall are also representations of two horses, ridden by jockeys.

Archæological Discoveries at Chester. THE excavations being carried on for the reconstruction of the Grotto Inn, at the end of Commonhall Street, Chester, have yielded further discoveries of considerable importance and interest, undoubtedly dating back to Roman times. In addition to the base of the Roman column already discovered, another has been unearthed of precisely the same construction. Both are *in sitû* upon the original wall, and on the south side of them there is still intact the water or rain gutter, while the masonry adjoining is quite perfect. It is highly probable that these two columns joined to others discovered in Commonhall Street, and thus can be traced out the north and south sides of what had been originally a large and imposing building. In clearing off the *débris* a quantity of charcoal and portions of charred timber were discovered with other remains, such as coins of Constantinus I. and II., fragments of bronzes, roofing tiles, and portions of a pair of millstones. It is inferred from the abundance of charcoal that the buildings were probably destroyed by fire.

Art Craftsmen. AN interesting little exhibition of examples of work done by members of the Guild of Art Craftsmen was held at 31, Cantilowes Road, Camden Square, London, N.W., on Monday and Tuesday, last week. The existence of this guild is not so well known as it might be, but, although its members are few at present, it is sure to push its way to the front of the Art world. The guild claims that its existence needs no apology, since, notwithstanding the growing demand for artistic objects of applied art, no really serious attempt has been previously made to place before the public specimens of modern work designed and executed by the co-operative action of a guild. The members of the guild are all craftsmen engaged in the production of art metal work, silver ware jewellery, carved ivory, furniture, enamelling, house decorations, &c. Three of its members have exhibited objects of applied Art at the Royal Academy. The work of these three gentlemen, whose names are Onslow Whiting, R. Garbe, and G. M. Ellwood, was very much in evidence at the exhibition. Another of the members is Benjamin Nelson, whose skill in glass painting and enamelling has called forth the praise of Sir William Richmond and others.

The Exhibition. THE works exhibited were simply examples of the members' ability as art craftsmen. In some cases the works had been executed to the order of patrons, while in others they were produced as specimens of handiwork, and were for sale. The object of the exhibition, the guild's first, was to interest those who desire to see the revival of the artist craftsmen. The members of the guild modestly admit that they by no means regard themselves as having attained the limit of artistic excellence, but, being young, they confidently expect that their work will go on steadily improving. One of the most striking exhibits was a handsome oak cabinet, about 7ft. high, the work of Mr. G. M. Ellwood. Its principal characteristic was the inlaid work in the hinges, which were of steel, and had been cut out in a neat design. Underneath the hinges were seen plates of copper, which were let into the oak, and to which the hinges were fastened. The cabinet itself was of simple but somewhat heavy appearance. Another excellent piece of work was an oak chimneypiece, designed by the same gentleman The panel of this was of silver, and on it was worked a design by Onslow Whiting, the subject of which was the Road to the Tourney. There were also two smaller panels, showing the fight and the victor. There were various other small exhibits of painted glass, enamelled glass, carved ivory, needlework, statuettes, and plasterwork, all of which were well executed.

A Famous Dutch Artist. A LINK with the past has been broken by the death of the Dutch painter, David Bles, who was the doyen of his profession in Holland. He saw the new school of Art arise, and, during the later years of his life, he remained almost the last representative of the old. Dutch Art in the first years of this century was living on the reputation of its earlier schools. The spirit had fled from it, and the great ambition of each painter was to reproduce or rival the finish, or microscopic minuteness of Netscher and his followers. David Bles rescued it from this hopeless state of decline. He made Teniers his model; he took a little inspiration from our own Wilkie; he revived genre, and flavoured it, as the old Dutch masters so well knew how to do, with humour. The new school, the school of Maris and Mauve and Mesdag and De Hass, was just coming on. Bles had a great vogue, and knew how to keep it. The Italian Government selected him as the artist whose portrait should represent modern Dutch Art in the Cosmopolitan collection of painters' portraits at the Uffizzi, and paid similar honours to Leighton, Millais, and Watts. His last important work was the portrait of the young Queen of Holland, at the time of her coronation.

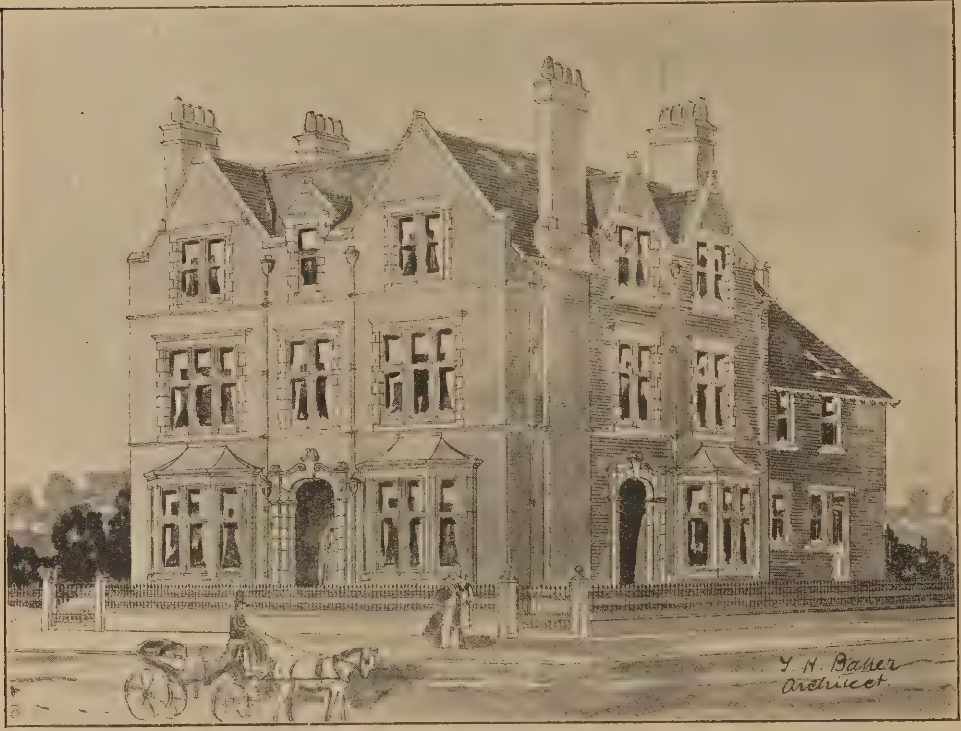
Interesting Discovery at Penn. A FACULTY applied for by the Vicar (Rev. B. J. S. Kerby) and churchwardens of the parish of Penn, Buckinghamshire, for the removal of an old high-backed pew in the historic church was granted, and the pew has just been taken down. The floor upon which it stood was found to be a false one, resting on the original one, which was dangerously perished. The decayed material having been cleared away, the coffin of William Penn, who was buried there in 1638, was discovered lying within 4in. of the surface. It was of oak, black with age, and perfectly sound. The floor having been carefully covered and sealed, was relaid and cemented round The interest of this discovery wants some further elucidation. The William Penn who occurs to everybody's mind on hearing the mention of the name lies in the Quaker's burial ground at Jordan, and the year of his death was 1718. Admiral Sir William Penn did not die till 1670, and he lies in St. Mary Redcliffe's, Bristol.

Another New London Thoroughfare. NEGOTIATIONS are now being made by the London County Council for the purchase of about twenty houses that will have to come down to enable them to form the new thoroughfare that is to run from the Borough High Street, through the churchyard of St. George the Martyr, to a point in Long Lane, Bermondsey, a little below Tabard Street. Directly the property is acquired, which may be in about a month's time, the work will be commenced. This is estimated to cost £194,000. It appears from the plans that the new road will sweep away three large shops to the left of the church, and form an open thoroughfare 60ft. wide through the churchyard, isolating the church from that part of it that abuts on the side of the old Marshalsea prison, and clearing away all the houses, and perhaps part of the courts, on the left side of Long Lane down to a place of business popularly known as "Harding's." In return for the part of the churchyard and recreation ground that is swept away, the L.C.C. will give a piece of ground of equal dimensions close by.

Professional Practice.

Bristol.—The dedication service of a new chapel at St. Anne's Park was held on Wednesday. The new building, for the present, will be used as a chapel and also as a Sunday-school, but eventually for the latter purpose only. It comprises the school chapel, measuring 40ft. by 28ft., with seating accommodation for about 250 persons, and in the rear of this a vestry, with kitchen and lavatory accommodation. The style is perpendicular Gothic. The walls are built of red pennant with freestone dressings. The large room has an open boarded roof and pitch pine dado. The floors are of pitch pine blocks, and the windows are glazed with leaded lights. The work has been carried out by Mr E. C. Norris, and the architects are Messrs. La Trobe and Weston.

Clacton-on-Sea.—The two houses here illustrated are to be built in the Marine Parade, West Clacton, on Round's Estate, facing the sea. The materials proposed to be used are local red bricks, red Broseley tiles, and Ancaster stone. The lowest tender was £2,440. Mr. T. H. Baker, of Colchester and Clacton-on-Sea, is the architect.



HOUSES AT CLACTON-ON-SEA. T. H. BAKER, ARCHITECT.

Ebbw Vale.—Sir William Harcourt opened the new county schools on Wednesday. The schools have been erected at a cost of about £2,600, and are arranged on the dual principle. The accommodation provides for sixty boys and forty girls. There are four class rooms, two of which are convertible, by means of folding partitions, into one large assembly room. Provision is also made for music and art room, cookery, laundry, and scullery, chemical laboratory and workshop, and, in addition, hat and cloak rooms for boys and girls respectively, and rooms for masters and mistress. Simplicity of plan has been aimed at, with the least possible length of corridors. There are separate entrances for boys and girls, and the cookery, laboratory, &c., form separate wings to each department. The building is of Ebbw Vale buff brick, with bands of red and dressings of Bath stone. Internally the joinery is of stained Oregon pine, the corridors, cloak rooms, and laundry are of granolithic, concrete, and the floors generally of wood blocks. The contractors were Messrs. Lawson and Co., Newport, and the joint architects were Mr. J. H. Phillips, of Cardiff, and Mr. F. Baldwin, of Brecon.

Knowle.—Board Schools have recently been commenced from designs by Mr. H. Dare Bryan, and include a large mixed school, providing accommodation for 500 children, an infants' school, seating 250 children, and, in the basement, a large cookery school, bonnet room, scullery, &c., for girls, and a manual instruction workshop for boys. Provision is made for an extension of class-room accommodation for 200 additional scholars. In the mixed school there will be a central hall 80ft. by 35ft., which, in addition to educational purposes, may be used for public meetings. Messrs. Keen and Keen are the contractors for the work.

Lozells.—The memorial stone of a new mission hall in Berner's Street, Lozells, was laid on September 16th, by Miss M. A. Wheeler, of Ealing, London, who gave the freehold of the land on which the building is being erected. When completed, the hall will be two storeys high. The ground floor will be divided into class and reading rooms, suitable for use as a young men's club, while the mission room proper will be above, and will be capable of accommodating about 450 persons. At one end there is to be a large platform or chancel, but in order that the room may also be used for social purposes, this portion will be made to screen off. The actual cost of building, which is being carried out by Messrs. Harley and Sons, Smethwick, from the designs of Mr. Daniel Arkell, will be £2,184, but the cost of furniture and other items, will bring the total up to £2,734.

Richmond.—The new Theatre Royal and Opera House was opened for performances last Monday week. Mr. Frank Matcham is the architect. The new theatre stands immediately opposite an open space known as the Little Green, to which it presents a highly ornamental front of red brick and terra-cotta. On both sides the building is surmounted by a turret, each of which has been utilised for ventilating purposes. The entrances to all parts of the house (with the exception of the gallery) are in front, a balcony, accessible to boxes, stalls, and dress circle, extending along the entire front. The main staircase, facing the entrance, is of marble. A special feature is that each corridor leading from the street has double doors, thus insuring the audience immunity from draughts. The total seating accommodation is for 1,227 persons. The decorations of the auditorium are in the Elizabethan style. The entire building, before and behind the curtain, is lighted by electricity. The design of the ceiling, which stands out in fine relief, has four subject panels representing scenes from "Hamlet," "A Midsummer Night's Dream," "King Lear," and "Romeo and Juliet." The proscenium opening is of marble, having on either side a draped column springing directly from an oak-panelled base, which forms the sides of the stalls. The act drop represents a view of Richmond Bridge. The stage can be entirely separated from the auditorium. The width of the proscenium opening is 27ft., and the stage measures 34ft. from back to front, 52ft. across the full width, and 50ft. in height to the grid, above which there is room for men to work. Beneath the stage are rooms for supers and the members of the orchestra. For the performers themselves there are eight dressing-rooms, of varying size, on three floors at the back of the stage.

Sheffield.—An important addition to St. Vincent's Church, Solley Street, that has been in progress since the close of last year has just been opened. The addition, consisting of a roomy aisle, completes the plan of the building as originally projected at the time of its erection in 1856. The church was planned with a spacious nave 110ft. long, and 30ft. wide, with an apsidal termination, and a southern aisle. The base of a massive tower was carried to the height of the church a few years later, and in 1890 a chapel of the Sacred Heart was erected in the southern aisle. The new aisle is 100ft. in length, and 22ft. in width. In arched recesses in the outer wall are placed the Confessionals. Over the recesses there are large three-light windows with marble arcaded shafts in the interior. At the end of the aisle is a transept, against the east wall of which near to the entrance to the new sacristies is to be placed an altar in honour of St. Joseph. An organ chamber has also been constructed at the eastern end of the south aisle, and an entrance porch and doorway with carriage access from Solly Street complete the new aisle. The building is designed in a lancet style of architecture to harmonise with the original edifice. The new aisle, including the re-heating of the entire church, St. Joseph's altar, and some minor alterations, will cost £3,000. The architects of the new work are Mr. C. Hadfield and Mr. C. M. Hadfield; and the builders are Messrs. O'Neil and Son.

Sledmere.—The Queen Eleanor cross which Sir Tatton Sykes, Bart., has caused to be erected at Sledmere, at the junction of the York and Malton roads, is nearly completed. Its height is about 55ft., and it is built of Portland stone. From the ground to the cresting of the first stage it is octagon in plan, and from thence all is square, excepting the second stage, which has a niche projecting from each face, so forming a cross in plan. Starting from the base is a plinth with a fine flight of eight steps. At each corner is a buttress, terminating in a pinnacle, both being freely ornamented, and between the buttresses are moulded panels with gablets enclosing shields bearing the arms of England, Castile, &c. The second stage has on each face a figure over 6ft. high, standing under a fine canopy. The canopies are very elaborately carved and ornamented. The third stage is solid, the faces being filled with panels with tracery heads, and gables with crockets and finials; while the topmost stage has on each face, between mullions, female figures with crowns on their heads, in attitudes of prayer and adoration. The figures were executed in the studios of Mr. Thompson, at Peterborough, who is also the builder of the cross, from designs by Mr. Temple Moore, of Hampstead.

New Companies.

William Townson and Sons, Limited.

This company was registered on September 18th, by C. H. Hodges, 12, New-court, W.C., with a capital of £15,000 in £5 shares, to adopt an agreement for the acquisition of the business of joiners and builders, carried on by W. Townson, at Bolton, Lancashire, and to develop and extend the same; also as timber growers and merchants, sawmill proprietors, &c.

Preston and District Brick and Tile Company, Limited.

This company was registered on September 12th, by Pitman and Sons, 14, Clements-lane, E.C., with a capital of £10,000 in £1 shares, to carry on in the township of Cottan, near Preston, the business of brick and tile manufacturers, to adopt an agreement with W. Harrison, and to build and maintain workshops and other premises. The first directors (to number not less than three nor more than seven) are to be appointed by the subscribers. Qualification, 100 shares.

John Board and Co., Limited.

This company was registered on September 13th, by Waterlow Brothers and Layton, Limited, Birchin Lane, E.C., with a capital of £60,000, in £1 shares, to acquire and take over as a going concern the businesses now carried on at Dunball, in the county of Somersetshire, and elsewhere, under the styles or firms of John Board and Co. and the Dunwear Brick and Tile Company, and all or any of the assets and liabilities of the proprietors of the business in connection therewith, and with a view thereto to adopt and carry into effect an agreement expressed to be made between W. S. Akerman of the first part, C. W. M. Greenhill of the second part, W. Brice and E. L. H. Reed of the third part, and this company of the fourth part, and, generally, to carry on business as dealers in or agents for the sale of cement, lime, brickyard goods, scouring bricks, building materials, and other articles of a like nature; as warehousemen, carriers, barge owners, steamship owners, shipowners, wharfingers, and builders; to acquire and turn to account any shops, warehouses, tenements, plant, machinery, stock-in-trade, horses, carts, or other property necessary or expedient for carrying on the company's business. The first directors (of whom there shall be not less than three nor more than five) are W. S. Akerman, C. W. M. Greenhill, and K. A. Akerman. Qualification, £5,000. Remuneration: W. S. Akerman, £300 per annum; C. W. M. Greenhill, £150; of others to be fixed by the company.

R. W. Blackwell and Co., Limited.

This company was registered on August 29th, by Messrs. Sutton and Co., 3 and 4, Great Winchester Street, E.C., with a capital of £200,000 in £1 shares. To carry on in all or any of their respective branches the businesses of electrical engineers and electricians, as producers and suppliers of electricity for the purposes of light, heat, or power, or otherwise as manufacturers of and dealers in all plant, machinery, and apparatus for the generation, distribution, supply, and accumulation of the same; to lay out and maintain all necessary cables, wires, lines, lands, and works in connection therewith; to construct and maintain any rail or tram roads, whether worked by electricity or otherwise, also omnibuses and other vehicles; builders of rolling stock, engines, trolleys, and machinery of every description, tramcars, carriages, trucks, and locomotives; boilermakers, mechanical engineers, machinists, fitters, metal workers, wire drawers, tube makers, smiths, builders and contractors, or any other business capable of being carried on in connection with the aforesaid businesses or any of them; to construct and maintain docks, piers, wharves, warehouses, irrigation works, reclamation, improvement, sewage, and drainage works; to acquire, deal with, work and turn to account in such manner as the company shall see fit any decrees, concessions, lands, buildings, works, &c. The signatories (each one share) are Messrs. A. J. F. Barker, P. Dawson, F. H. Baker, C. Dickenson, A. H. Barker, B. N. Howell, and R. Brown. The first directors (of whom there shall be not less than three nor more than five) are to be elected by the signatories. Qualification, £1,000. Remuneration, £200 per annum each.

Brightside Foundry and Engineering Company, Limited.

This company was registered on September 18th by Pilgrim and Co., 17, Coleman Street, with a capital of £90,000 in £1 shares. The purchasing of the undertaking and business of the Brightside Foundry Company, Limited, the business carried on under the firm of Walter Eaton and Co., and the undertaking and business of J. C. and J. S. Ellis, Limited, all in the city of Sheffield, and the goodwill thereof, and the works and premises whereon the same are respectively carried on, and certain hereditaments adjoining or near to the said works, and the plant, tools, stock-in-trade, contracts, and other rights and privileges belonging to or connected with the said respective businesses; and with a view to the above objects, or any of them, to adopt and carry into effect an agreement expressed to be made between the Brightside Foundry Company, Limited, J. C. and J. S. Ellis, Limited, and others and this company; and, generally, to carry on business as manufacturers of and dealers in all plant, machinery, and apparatus for the generation, distribution, supply, and accumulation of the same: to construct and maintain any rail or tram roads: as builders of rolling stock, engines, trolleys, and machinery of every description, &c., boilermakers, mechanical engineers, builders and contractors, or any other business capable of being carried on in connection with the aforesaid businesses or any of them: to construct and maintain docks, piers, wharves, &c.: to acquire and turn to account any decrees, concessions, lands, buildings, works, &c. The first directors (of whom there shall be not less than four nor more than seven) are A. Firth, G. Shaw, B. Freeborough, T. Wilkinson, and T. H. Firth. Qualification, £1,000. Remuneration to be fixed by the company.

Pinchin, Johnson and Co., Limited.

This company was registered on September 18th, by Gush and Co., 3, Finsbury Circus, with a capital of £60,000 in 4,000 preference shares of £5 each and 40,000 ordinary shares of £1 each, to acquire as a going concern the business of oil refiners, colour, paint, and varnish manufacturers, and wholesale drysalters as now and hitherto carried on at Broad Street, Ratcliff, Middlesex, under the style of Pinchin, Johnson and Co., together with all or some of the assets and liabilities of the said business and the goodwill thereof, and to carry on in such places in the United Kingdom and elsewhere as may from time to time be determined all or any of the trades or businesses in all their various branches of white lead and zinc manufacturers and merchants, colour makers, levigators, and grinders, paint manufacturers, varnish makers, oil boilers and refiners, glass, lead, oil, paint, varnish, and colour merchants, importers, manufacturers, and exporters, drysalters, sheet-lead rollers, lead-pipe drawers, and shot manufacturers, sanitary ware manufacturers, brush manufacturers, timber merchants, wood sawyers and turners, and general wood workers, seed crushers, and tallow chandlers; as dealers in all kinds of plant, machinery, apparatus, tools, utensils, products, substances, materials, merchandise, articles, and things necessary or suitable for the carrying on of the above trades or any of them; as bankers, financiers, capitalists, and general merchants; to acquire and turn to account any real or personal property, patents, patent rights, and inventions; to erect or construct and maintain wharves, factories, buildings, warehouses, works, machinery, and plant for the purposes of the company's business. The signatories are: A. C. Hill, T. Rosenberg, E. Rosenberg, C. E. Dowling, D. J. Wood, L. Weeple, and A. H. Franch, each with one share. The first directors (of whom there shall be not less than three nor more than five) are to be elected by the signatories. Qualification, £500. Remuneration to be fixed by the company.

Trade and Craft.

GRATES, STOVES, AND VENTILATORS.

Messrs. E. H. Shorland and Brother, the well-known Manchester firm of warming and ventilating engineers, whose works are in Drake Street, Stretford Road, have sent us their recently-issued catalogue. This comprehensive work runs to nearly 100 pages, is printed on three different colours of paper, and is strongly bound. The firm call particular attention to their new patent projecting Manchester grate, the firebox of which is lined entirely with fire tiles, the back portion being made to project well over the fire. This increases the radiating and smoke-consuming powers of the grate, besides increasing its warm air generating properties. The patent grate back can be used in any grate which has a projecting canopy, but for grates with flat canopies it does not project so far. The grates look very handsome in conjunction with the richly-glazed faience chimneypieces supplied by the firm. Another of the firm's specialities is the patent exhaust roof ventilator. This is made of the best rolled steel, galvanised, and painted with enamel paint. It is constructed to give the largest amount of outlet possible for the vitiated air. It is perfectly weatherproof and without down draught, and can be easily fixed on the roof, only requiring a wood box covered with lead or zinc, over which the base of the ventilator is placed and secured by screws. The patent Manchester stoves are made with either ascending or descending smoke flues, and with either one or two fires. They are largely used in hospitals and other public buildings. The catalogue contains a large number of new designs of the patent exhaust roof ventilators, inlet tubes, and inlet panels.

INTERTALK TELEPHONE SYSTEM.

One of the latest improvements on intercommunication by telephone is an instrument which has been patented by Mr J. D. F. Andrews, of the firm of Messrs J. D. F. Andrews and Co., Ltd., Fulham Electric Works, Putney Bridge Station, Fulham, S.W. This instrument has been devised for a common return and for metallic circuits, so that overhearing by induction is entirely avoided. The communication is effected by the simple pressure of a push, which calls the distant instrument while pressed and connects for speaking after removing the finger. By pressing two or more of these buttons simultaneously, a corresponding number of persons may be put in conversation with each other, a matter of great convenience in many instances. By replacing the telephone on the hook, disconnection is automatically effected and the pushes replaced ready for a future call. The objects referred to are obtained by a very simple, and, to all appearance, reliable construction of instrument. There is an oscillating bar connected with the home receiver and transmitter arranged as a common catch for the springs of all line pushes and when one of these is depressed to its limit, it comes against a contact connected with the home battery, and thus effects a call on the bell at the distant instrument. When the finger is removed, the push catches on to the oscillating bar and makes connection with the speaking instruments. It will be obvious from this brief description how easy it is to effect connection with several people at the same time. The construction of the instrument admits of easy access for examination or adjustment, the whole of the parts being mounted on one base contained in the case of the instrument, which can be easily removed.

New Patents.

The following abridged description is specially drawn for The Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all Patent matters.*

10,328. Roofs.—Patentee: F. W. Golby, of Chancery Lane, Middlesex (Bellinghen-Tomberg, F. van; Brussels). The slates are secured to the battens by bent metal spring clips.

10,359. Hinges for Doors, Windows, &c.—Patentee: G. Goller, Jean Paul Stre, Bayreuth, and H. Goller, Lerchenfeld, both in Bavaria, Germany. The pin and socket portions are each cast with a screw and a screw hole for an extra screw, the socket portion being attached to the door. A templet is used in boring the screw holes in the door and frame to insure correct attachment.

10,387. Guards for Wood Planing Machines.—Patentee: F. Love, 24, Stanley Street, Groves, Yorkshire. Consists of an arched or curved plate which is placed over the cutters of a wood-planing or moulding machine with vertical cutter spindle. This arched plate is fixed to the bench by a bracket, the upper end of which is fixed to the plate adjustably by means of a screw and slot. Notches are cut in the sides of the plate to admit the wood. A curved plate is fixed over the end of the arch by a slotted bracket. The guard may be applied to any machine of like construction to the above wood-planing machine.

10,401. Windows.—Patentee: H. B. Ives, 529, State Street, New Haven, Connecticut, U.S.A. The sash is prevented from rattling by pressing it against the guide rail by means of the bead which is adjustably secured to the casing. The bead is provided with a hole into which a projecting portion is driven. The bottom is somewhat thicker than the sides, and has a slot for the passage of the securing screw. The bottom of the part may be corrugated so as to firmly engage the head of the screw when driven home. The necessary adjustment is obtained by loosening the screw and moving the bead, and the part relatively to it.

CURRENT PRICES.

		£	s.	d.	£	s.	d.
OILS AND PAINTS.							
Castor Oil, French ...	per cwt.	1	5	8	1	6	10
Colza Oil, English ...	per cwt.	1	4	9	1	5	0
Copperas	per ton	2	0	0	—		
Lard Oil	per cwt.	1	9	0	—		
Linseed Oil	per cwt.	1	2	4½	—		
Neatsfoot Oil	per gal.	0	2	6	0	4	0
Petroleum, American ...	per gal.	0	0	6¾	0	0	6 7/8
Do., Russian ...	per gal.	0	0	5 5/8	—		
Pitch	per barrel	0	8	0	0	8	6
Tallow, Town	per cwt.	1	4	0	1	5	0
Tar, Stockholm	per barrel	1	5	6	1	6	0
Turpentine	per cwt.	1	16	6	1	16	7½
Glue	per cwt.	1	14	0	2	18	0
Lead, white, ground, carbonate	per cwt.	0	19	0	—		
Do. red	per cwt.	0	18	1½	—		
Soda crystals	per ton	3	10	0	—		
Shellac, orange	per cwt.	3	6	0	—		
Pumice stone, ...	do.	0	8	9	—		
METALS.							
Copper, sheet, strong ...	per ton	88	0	0	—		
Iron, bar, Staffs. in London	do.	8	10	0	9	10	0
Do. Galvanised Corrugated sheet ...	do.	13	10	0	14	0	0
Lead, pig, Spanish ...	do.	15	10	0	—		
Do. do. English common brands	do.	15	13	9	—		
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	16	10	0	—		
Do. pipe	do.	17	5	0	—		
Nails, cut clasp, 3in. to 6in.	do.	9	0	0	10	0	0
Do. floor brads	do.	8	15	0	9	15	0
Tin, Foreign	do.	147	0	0	147	10	0
Do. English ingots ...	do.	150	0	0	151	0	0
Zinc, sheets, English ...	do.	140	0	0	28	10	0
Do. do. Veille Montaigne	do.	39	10	0	—		
Do. Spelter	do.	22	7	6	22	12	6
TIMBER.							
Soft Woods.							
Fir, Dantzic and Memel	per load.	3	0	0	4	0	0
Pine, Quebec Yellow ...	per load	4	7	6	6	5	0
Laths, log, Dantzic ...	per fath.	4	10	0	5	10	0
Do. Petersburg	do.	4	0	0	6	10	0
Deals, Archangel 2nd & 1st	per P. Std.	15	10	0	20	5	0
Do. do. 4th & 3rd.	do.	12	0	0	12	5	0
Do. do. unsorted	do.	12	5	0	—		
Do. Riga	do.	6	15	0	8	10	0
Do. Petersburg 1st Yellow	do.	10	10	0	16	0	0
Do. do. 2nd „	do.	10	10	0	12	0	0
Do. do. Unsorted „	do.	8	10	0	10	15	0
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	per P. Std.	10	0	0	12	5	0
Do. White Sea	do.	18	0	0	—		
Do. Quebec Pine, 1st...	do.	20	0	0	23	15	0
Do. do. 2nd	do.	13	15	0	15	15	0
Do. do. 3rd &c.	do.	7	15	0	9	15	0
Do. Canadian Spruce, 1st	do.	9	0	0	10	5	0
Do. do. 3rd & 2nd	do.	6	5	0	7	15	0
Do. New Brunswick	do.	7	5	0	8	0	0
Battens, all kinds	do.	7	0	0	14	0	0
Flooring Boards, 1 in. prepared, 1st	per square	0	11	0	—		
Do. 2nd...	do.	0	10	0	0	10	6
Do 3rd &c.	do.	0	7	9	0	8	0
Pitch Pine	per load	3	12	0	3	15	0
Hard Woods.							
Ash, Quebec..	per load	3	17	6	4	10	0
Birch, Quebec	do.	3	12	6	3	17	6
Box, Turkey...	per ton	7	0	0	15	0	0
Cedar, 1in., Cuba	per ft. sup.	0	0	4	—		
Do. Honduras	do.	0	0	3½	—		
Do. Tobasco	do.	0	0	2¼	0	0	3¾
Elm, Quebec	per load	4	12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0	0	5 29/32	0	0	5¾
Do. African ...	do.	0	0	5 1/32	—		
Do. St. Domingo ...	do.	0	0	5 7/16	0	0	¾
Do. Tobasco ...	do.	0	0	5⅛	—		
Oak, Dantzic and Memel	per load	3	5	0	3	5	0
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks ...	do.	9	5	0	15	10	0
Wainscot, Riga (Baulk) ...	do.	3	15	0	5	15	0
Do. Odessa Crown ..	do.	3	15	0	5	15	0
Walnut, American ...	per cub. ft.	0	2	6	0	4	0

COMING EVENTS.

Wednesday, September 27.

Sanitary Institute.—(Lectures for Sanitary Officers.)—Mr. John Castell-Evans on "Soil and Local Physical Conditions." 8 p.m.

Builders' Foremen and Clerks of Works Institution.—Quarterly meeting of the directors. 8 p.m.

Thursday, September 28.

Royal Institute of Public Health.—Last day of Congress at Blackpool.

Friday, September 29.

Sanitary Institute.—(Lectures for Sanitary Officers.)—Mr. John Castell-Evans on "Meteorology." 8 p.m.

Monday, October 2.

Worshipful Company of Carpenters.—At the Carpenters' Hall, London Wall, E.C. Commencement of evening classes in building construction, drawing, and quantities. Architectural lectures at the King's College, London. Particulars can be obtained from the Secretary at the College, or from Mr. S. W. Preston at Carpenters' Hall.

Society of Engineers.—Mr. J. Bridges Lee, M.A., F.G.S., on "Photographic Surveying." 7.30 p.m.

Tuesday, October 3.

University College, London.—Session begins.

National Association of Master House Painters.—Fifth annual convention at the Shire Hall, Hereford. (First day.)

Wednesday, October 4.

National Association of Master House Painters.—Fifth annual convention at the Shire Hall, Hereford. (Second day.)

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

DUBLIN.—For the erection of new branch offices, for the Star Life Assurance Society. Mr. A. Blomfield Jackson, architect, 26, Mecklenburgh-square, London:—

H. Pemberton...	£15,350 0 0	McLaughlin & Harvey	£13,996 7 5
W. Beckett ..	14,590 10 0	J. Beckett	13,850 0 0
Bolton & Sons	14,460 0 0	Collen Bros.* ...	13,490 0 0

*Accepted.

GREENWICH.—For alterations and additions to "The Ship and Sailor" public-house, Church-street, Greenwich, S.E., for Mr. Thomson. Mr Edmund J. Stevens, architect, 246, Camberwell-road, S.E. Quantities supplied:—

Edwards and Medway	£1,647	J. Tyerman	£1,183
Whitehead and Co. ...	1,450	W. Cook	1,130
Falkner and Sons ...	1,287	Scotney and Wootten	1,099
H. L. Holloway	1,242	Hy. Line	1,029
G. Newton	1,230		

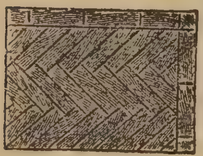
GREENWICH.—For structural alterations, painting, &c., to the "Admiral Hardy" public-house, Clarence-street, Greenwich, S.E., for Mr. W. Smith. Mr. Edmund J. Stevens, architect, 246, Camberwell-road, S.E. Quantities supplied:—

		Painting, &c.
Whitehead and Co.	£1,475	£115
G. Newton	1,451	105
J Tyerman	1,407	97
Little and Senecal	1,388	97
Falkner and Sons	1,387	137
Wm. Cook	1,279	93

GREENWICH.—For the erection of artisans' dwellings at Greenwich, for the Greater London Property Company, Limited Mr. Alfred Roberts, architect, 18, Nelson-street, Greenwich, S.E.:—

F. and H. F. Higgs ...	£2,734	T. D. Leng	£2,296
Hayter and Son	2,400	W. Martin *	2,259
Jones and Groves ...	2,355		

* Accepted.



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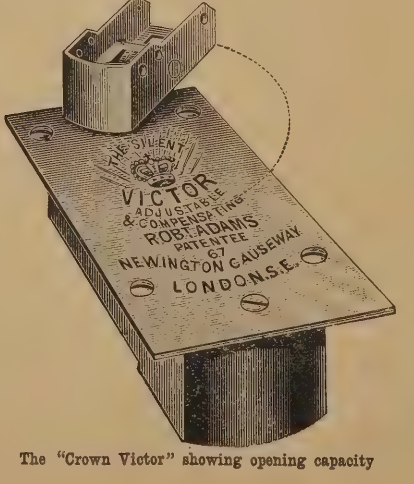

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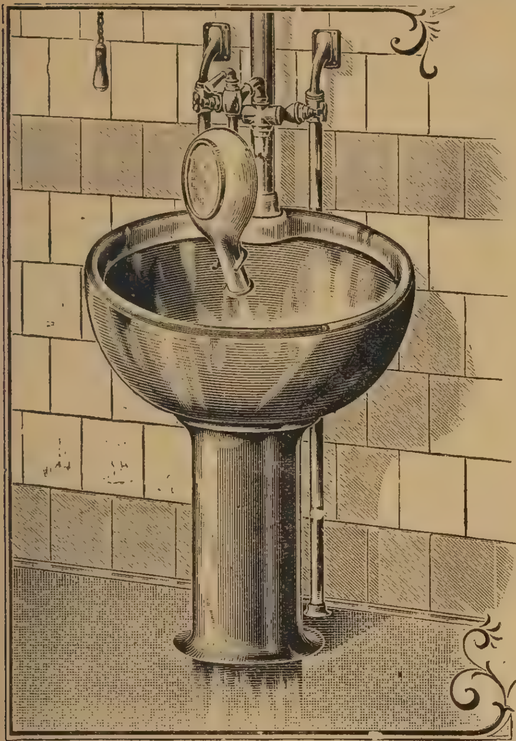

AGENTS:
LONDON: S. Maw Son & Thompson, 7 to 12, Aldersgate St., E.C.
DUBLIN: T. W. Little, Harcourt Street.
BELFAST: R. Patterson & CO., 57 & 59, High Street.

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FOUNTAINS AND STATUES,
BALCONIES, VERANDAHS,
PORCHES,
BROSELEY "LIGHTMOOR" ROOFING TILES.

BATHS of BEST FINISH.

ENFIELD.—For the erection of a block of schools, Chase-side, for the School Board. Mr. G. E. T. Laurence, architect, 181, Queen Victoria-street, E.C. Quantities by Messrs. D. Campbell and Son, 4, Finsbury-circus, E.C. :—

—	Tender.	Add if floors in hard wood.			Total.
		Pitch Pine.	Maple.	Oak.	
	£	£ s. d.	£ s. d.	£ s. d.	£
Balaam Bros.	22,200	65 0 0	186 0 0	450 0 0	—
Wilkinson and Son	22,177	51 8 6	179 19 8	462 16 6	—
W. Laurence	20,999	48 0 0	169 6 6	452 2 9	—
Martin Wells and Co.	20,199	47 0 0	167 0 0	449 0 0	—
T. Almond and Co.	20,098	42 17 0	154 5 6	411 8 0	—
S. Sharpington	19,990	42 17 1	179 19 9	565 13 6	—
J. Shelbourne and Co.	19,524	47 0 0	167 0 0	437 0 0	—
King and Son	19,245	47 0 0	163 0 0	429 0 0	—
Hockley and Son...	18,800	42 17 1	154 5 6	411 8 0	—
Fairhead and Son	18,347*	51 0 0	171 0	454 0 0	18,518*

* Lowest tender accepted subject to approval of Education Department.

HALIFAX.—For the extension of engine-room, &c., at electricity works, for the Corporation. Mr. W. H. D. Horsfall architect, Town-chambers, Silver-street, Halifax :—

Masonry.—Ben Riley, Lewis-street, Halifax	£2,250	0	0
Joinery.—Sam Greenwood, Boothtown, Halifax	253	0	0
Plumbing and Glazing.—William Ward, Broad-street, Halifax	195	10	6
Ironwork.—Lee and Harrison, Leeds ...	293	1	6
Concreting.—Greenwood and Sons, Brunswick-street, Halifax	130	7	6
Slating and Plastering.—Rushworth and Firth, New Bank, Halifax	153	0	0
Paintiug.—Thomas Kendal, Queen's-road, Halifax	35	10	3

IPSWICH.—For additions to Borough Fever Hospital, for the Corporation. Mr. E. Buckham, Borough Surveyor, Town Hall, Ipswich :—

Parkington and Son ...	£1,624	Roper	£2,566
Linzel	2,585	Borrett, Ipswich* ...	2,550

* Accepted.

IRVINE (N.B.)—For the erection of academy for the Burgh School Board. Mr. J. Armour, jun., architect, Irvine. Quantities by Messrs. John Dansken and Purdle, I.M., West George-street, Glasgow :—

Masonry.—MacLachlan and Son* ...	£5,529	12	4
Joinery.—C. Wark*	2,438	17	3
Plumbing.—J. Johnston*	711	1	9
Slating.—J. Johnstone*	266	16	8
Plastering.—D. Stobie*	380	16	0
Heating.—Hall and Sons*	386	11	6
Total	£9,915	15	6

* Accepted.

KENSINGTON.—For the erection of shops, Nos. 225 and 227, Kensington High-street. Mr. W. L. Eves, architect, 54, High-street, Uxbridge :—

Higgs and Hill	£4,984	Lole and Lightfoot ...	£3,798
F. and H. F. Higgs ...	4,175	Marsland	3,785
Bywaters...	4,060	Kearley, Kensington *	3,770
Holliday & Greenwood	4,020		

* Accepted.

KENSINGTON.—For alterations and additions to 197 to 203, Kensington High-street. Mr. W. L. Eves, architect, 54, High-street, Uxbridge :—

Polden	£3,357 15	Kearley, Kensington (accepted) ...	£2,414 15
Lole and Lightfoot	2,725 0		

KINGSTHORPE (Northampton).—For the erection of shoe factory, Bective Estate, Kingsthorpe, for Messrs. James Branch and Sons. Messrs. Mosley and Anderson, architects, Northampton. Quantities by the architects :—

E. Green	£7,884	W. Beardsmore	£5,934
R. Cosford	7,000	H. Green	5,900
Sharman and Son ...	6,585	W. Heap	5,860
Wingrove and Stanley	6,493	A. P. Hawtin	5,846
C, Webster	6,344	A. J. Chown*...	5,700
G. J. Fisher	6,280		

* Accepted.

LONDON.—For the erection of a veterinary establishment and stables, &c., at Vauxhall, for Mr. W. Perryman. Mr. H. Hardwicke Langston, architect, 6, John-street, Bedford-row. Quantities not supplied :—

Bristow and Sons ...	£1,610	Hibberd Bros., Ltd. ...	£1,376
Head and Son	1,550	Falkner and Son... ...	1,337
H. H. Sherwin	1,416	Geo. Brittain*	1,137

* Accepted. [Architect's estimate, £1,150.]

NORTHAMPTON.—For the erection of shoe factory, Dallington, St. James', for Mr. A. E. Marlow. Messrs. Mosley and Anderson, architects, Northampton. Quantities by the architects :—

G. F. Sharman ...	£2,750 0	E. Green	£2,645 0
A. J. Chown	2,750 0	A. P. Hawtin	2,590 0
Wingrove & Stanley	2,690 0	Sharman and Son...	2,555 0
Johnson and Son ...	2,672 15	W. Beardsmore * ...	2,394 0
G. J. Fisher	2,664 0		

* Accepted.

RUSHDEN (Northants).—For the erection of shoe factory, Rushden, for Mr. B. Ladds. Messrs. Mosley and Anderson, architects, Northampton. Quantities by the architects :—

Sparrow	£1,075	F. Henson	£1,045
T. Wilmott, jun.... ...	1,064	R. Marriott	1,000
T. and C. Berrill... ...	1,059	T. Swindall *	979
Hacksley Bros.	1,050		

* Accepted.

UXBRIDGE.—For the erection of business premises, Vine-street, for Messrs. Randall Bros. Mr. W. L. Eves, architect, 74, High-street, Uxbridge :—

Duncan Curry	£3,646	Ward	£2,380
Flint	2,960	Kearley	2,160
Fassindge	2,390	Buttrum, Uxbridge*...	1,840

* Accepted.

WALTHAM CROSS.—For the erection of twenty villa residences, Freezywater, for Mr. R. B. Colvin. Mr. F. W. Adams, architect and surveyor, Finsbury-circus Buildings, 18, Eldon-street, E.C. :—

A. Porter	£10,400	W. Gardener	£9,296
H. Almond	9,980	Jennings & Grenfell*	7,882
Fairhead and Sons ...	9,500		

* Accepted.

WIGAN.—For the erection of offices, dynamo-house, boiler-house, &c., for the Corporation. Mr. H. Collings Bishop, electrical engineer, Quadrant-buildings, Wigan :—

H. & F. Lomax	£16,365 5 0	W. Winnard, Wigan*	£15,798 17 11
P. A. Ablett ...	16,289 8 3		
J. Wilson	16,128 18 9		

* Accepted.

CONTRACTS OPEN.

GREAT WESTERN and METROPOLITAN RAILWAYS.

The Joint Committee are prepared to receive TENDERS for the CONSTRUCTION of a new STATION at "Notting Hill and Ladbroke Grove."

Plans and specification may be seen, and forms of Tender and bills of quantities obtained, at the office of the ENGINEER at this Station, between the hours of TEN a.m. and FOUR p.m.

Tenders, addressed to the undersigned, and marked outside "Tender for new Station at Notting Hill," will be received on or before TUESDAY, the 3rd proximo.

The Directors do not bind themselves to accept the lowest or any Tender.

J. MAHON,
Secretary to the Hammersmith and City
Railway Joint Committee.

Paddington Station,
London,
September, 1899.

HACKNEY VESTRY.
TO BUILDERS.

The Hackney Vestry invite TENDERS for ALTERATIONS to and EXTENSION of the HACKNEY PUBLIC BATHS, Lower Clapton-road, N.E.

Plans and specification can be seen at the Offices of the Architects, Messrs. GORDON LOWTHER and GUNTON, Finsbury House, Blomfield-street, E.C.

Quantities can be obtained on application to the Architects upon payment of a deposit of £1 1s., which will be returned to persons sending in a bonâ-fide Tender with the priced bills of quantities.

Tenders, sealed and endorsed "Tender for Alterations and Extension of the Hackney Public Baths," must be delivered at the Town Hall, Hackney, not later than FOUR o'clock on WEDNESDAY, OCTOBER 11th, 1899.

The proposed contract will contain a clause providing that, in the case of all workmen employed by the contractor, he will be required to pay wages at rates not less, and to observe hours of labour not greater, than the rates and hours set out in the Vestry's schedule in force at the date of his Tender, and that penalties will be enforced for each and every breach of this clause.

The Vestry do not bind themselves to accept the lowest or any Tender.

GEO. GROCOTT,
Vestry Clerk.
Town Hall,
Hackney,
September 19th, 1899.

BOILERS FOR STEAM HEATING.
Hartley & Sugden, Ltd.
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Hard-Wood Joinery and Mouldings Manufactured in First-class Style.
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PHŒNIX WHARF, REDHILL-ST.,
REGENT'S PARK, N.W.
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OF EVERY DESCRIPTION.

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SEPTEMBER 27TH, 1899.

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See Large Advertisement, Back Page, Monthly.

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who have recently introduced into Europe the process now being so largely used in America, have erected large works in this country, and are now taking Orders for the supply of their

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. . and . .
THE R. G. DUNN BUILDING.

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CONSTRUCTING A DRUM-CURB FOR WELL SINKING.

By G. ELLIS.

WELL shafts are sunk in various ways, according to the distance from the surface of the water to be tapped. Deep wells—that is, those more than about 40ft. deep—are now invariably formed by driving down iron tubes or cylinders of small diameter into borings made by drilling machines. These are usually termed artesian wells, although, strictly speaking, an artesian well is one from which the water flows, or rather overflows, without the aid of pumping.

Shallow wells of small diameter are sometimes formed by lowering short cast-iron cylinders into the excavation, one above the other, and bolting the flanges together, then sinking them as the excavation proceeds by means of screw jacks or by simply loading the top with stones, &c. Wells of larger diameter are formed by the drum-curb process in the following manner:—

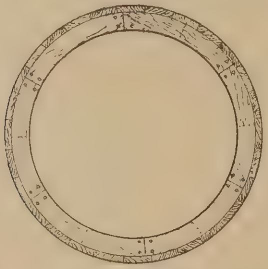

FIG. 1. PLAN OF DRUM-CURB FOR WELL-SHAFT.

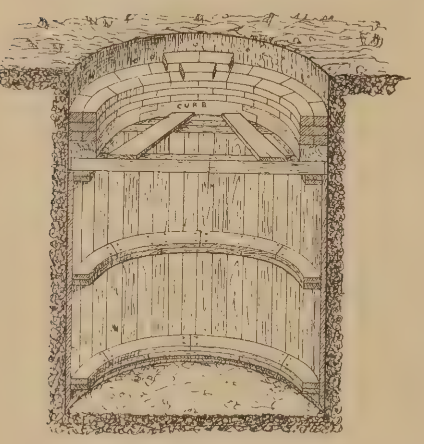

FIG. 2. SECTIONAL ELEVATION OF A DRUM-CURB.

A cylinder about 6ft. long and of an external diameter equal to the shaft to be sunk is constructed of 1in. elm boards, from 3in. to 6in. wide, nailed to the outside of three ribs; each of the latter is built up in two layers of 1¼in. elm plank, 4in. to 5in. wide when cut to the sweep. The layers are screwed together with the end of one segment lying in the middle of the one above it, as shown in the plan (Fig. 1). The bottom ends of the boards are bevelled on the inside to form a cutting edge, which, if the curb is intended to pass through stoney soil, is protected by a rim or shoe of sheet iron nailed on the outside and turned up for 1in. inside. The outside of the drum is planed smooth, or, in tenacious ground, can with advantage be covered with sheets of zinc nailed right round in horizontal strips, with the vertical joint butted. First the top sheet should be fixed, then the next below, and so on, the edges being overlapped an inch, and the edge of the lowest being covered by the iron shoe to prevent the zinc being ripped off by stones, &c.

When the drum is prepared, an excavation is made of about half its depth, into which it is lowered. A platform is then arranged on the top, and loaded with bricks. The excavators inside proceed with the digging, and as the core is removed by means of shears and tackle through an opening in the platform, the drum gradually sinks until it is flush with the ground. The platform, &c., is then removed and replaced by a thick elm curb, cut to the size of the brickwork, and lap-jointed and spiked together. Upon this, as a base, the bricklayers build the lining, or steining, in one, two, or three half-brick rings, in cement, and with as few headers as possible (see Fig. 2). The outside of the steining is kept regular to prevent, as far as possible, any rupture of the courses by friction with the sides of the shaft, and, as the excavation proceeds, the brickwork is continued above ground as high as practicable, its weight causing the whole to sink until water is reached. Sometimes the pressure on the sides becomes so great that no amount of weighting will make the drum descend. In such a case a fresh drum must be prepared, small enough to pass through the first, which is then filled in with brickwork between the ribs. The excavation then goes on inside the second drum, as in the first instance.

Smaller wells are sunk by the underpinning method, described in the article on foundations in Nos. 238, and 240, pp. xxvi. and xlii., of THE BUILDERS' JOURNAL.

SANITARY INSTITUTE.

THE ANNUAL CONGRESS.

(*Concluded from page lii., No. CCXLI.*)

PROFESSOR PERCY FRANKLAND, in opening Section III., said that England was well to the fore in practical sanitation, but was behind in sanitary science. He contrasted the amount of money expended on national defence and on hygienic education, and said that the progress of science was quite as important for commercial reasons as was national defence. He referred at length to the Bluebooks on sanitary science, which dealt with the substitution of water gas for coal gas, the use of lead in potteries and of phosphorus in matches, and said he was in favour of the recommendations of the committee. In regard to phosphorus, it was the obvious duty of everyone to abandon such matches. He next dealt with the application of bacteriology to sanitary science, and with regard to the bacteriological analysis of water he pointed out that the old idea that the bacteriologist was going to determine whether the condition of water was likely to cause disease or not was completely exploded, the real value of the bacteriological examination of water lying in the assistance which it rendered in controlling and checking the filtration and purification of water. There was no new principle in the bacteriological treatment of sewage, for it had been going on on the same lines for years without being recognized. Sewage purification was a fermenting industry, just as brewing was, but with this distinction—that, whereas brewing was one of the most remunerative of industries, there was no hope of sewage purification being carried on at a profit. Mr. W. D. Scott-Moncrieff, in the discussion which followed, said that the disappointment arising from the failure of sewage farms as sources of profit was now fully recognised and accounted for, but the solution of the sewage problem on purely national lines, if realised, must be profitable in the very nature of things, because where the cost of the necessary conditions was moderate the work itself was carried out for nothing.

Mr. W. H. Horrocks (London), in a paper on the behaviour of the *bacillus typhosus* in sewage, gave the results of numerous experiments which he had made, and said that these experiments did not by any means prove that the bacillus was not in the sewage. In the section for ladies, Miss Blanche Gardiner dwelt on the necessity for a universal practice and teaching of hygiene; Miss Wadmore on the need of teachers holding recognised certificates in hygiene; and Miss Mabel Proctor urged the advisability of physical education for girls. In the afternoon there were two water excursions, a garden party at Netley Hospital, and a visit to the corporation electrical works. In the evening a lecture to the congress was delivered in Hartley College by Mr. Malcolm Morris on "Tuberculosis."

The last sitting of the Congress was held on Friday, Sept. 1st, when the three sections met as on the previous day. In the Sanitary Science and Preventive Medicine Section Dr. A. E. Cope, Government Teacher of Vaccination, read a paper on the educational factor in the vaccination question and its relation to the securing of the best standard of vaccination, public and private, and Dr. Bushell Anningson read a paper on guarantees of the purity of milk supplies. Mr. Thomas Glover Lyon, physician to the City of London Hospital for Diseases of the Chest, read a paper on "Ventilation for Crowded Buildings, and Consumption Hospitals, with special reference to new methods of distribution and removal of air." This we shall publish in a future number.

In the Engineering and Architecture Section, Dr. D. S. Davies, medical officer of health, Bristol, in discussing the question whether the ventilation of sewers is necessary, said that in Bristol the sewers were totally unventilated, and had been so ever since they were constructed. He quoted statistics, gathered from mortality returns, to show that Bristol was more healthy than many towns where the sewers were ventilated.

Mr. W. Kaye Parry read a paper on sewage purification without filtration.

In the section for Physics, Chemistry, and Biology, Dr. S. Rideal introduced a discussion on the use of preservatives in food. A resolution was passed by the same section recommending the Institute to consider the desirability of taking steps to induce the Local Government Board to relax the requirements they usually make insisting on district councils providing land for the treatment of sewage effluents before loans for sewage disposal purposes are sanctioned, even in cases in which efficient contact beds are arranged for.

In the afternoon the closing general meeting of the Congress was held in the Council Chamber of Hartley College, the President (Sir W. H. Preece) in the chair. A statement was submitted by the Secretary of the Institute (Mr. E. White Wallis), showing that nine hundred and ten delegates had attended the Congress, representing four hundred and fifty municipal and county authorities, learned societies, and other bodies. There had also been present three hundred and seventy members of the Institute, ninety-one associates, three hundred and twenty local subscribers, and five hundred ladies, making a total of two thousand one hundred and ninety-one. Seventy-nine papers had been read and twelve presidential and introductory addresses delivered. Thanks were passed to the Local Committees for the welcome they had given to the members of the Congress and for the hospitality extended, and it was announced that the meeting next year would be at Nottingham.

Dr. Bailie J. Dick in the evening gave a popular lecture in Hartley College on infectious diseases hospitals. The following day (Saturday) there were excursions to various places of interest in the neighbourhood.

Ruskington Waterworks.—At the meeting of the Ruskington Urban District Council on Monday night, last week, Mr. J. Clare, C.E., produced a plan and estimate of the cost of the new waterworks forced upon the parish by an order of the Local Government Board. He stated that the new boring now yielded 220,000 gallons per day, and when Dr. Ashby's analysis was received it would be forwarded to the Local Government Board. He estimated the initial cost at £2075. The plan and estimate were adopted, and it was resolved that the Clerk obtain a loan of the money required. Councillor Cole offered to give the site required for the waterworks, and it was agreed to purchase an additional plot of 200yds. of land for contingencies.

PUBLIC HEALTH CONGRESS AT BLACKPOOL.

THE Public Health Congress was opened at Blackpool on September 21st, when the Marquis of Lorne delivered a presidential address. The Mayor of Blackpool presided, and more than a thousand delegates from all parts of the kingdom were present. The object of the Congress is the discussion of all questions relating to the improvement of the public health and the investigation and study of all branches of State medicine. An exhibition has been opened in connection with the Congress, and will remain open till October 14th. The exhibits afford a remarkable object-lesson on the achievements of sanitary science during recent years, and illustrate all departments of practical work in the interests of the health of the community. A special section has been devoted to appliances for smoke abatement and the economical consumption of fuel, the object being the much-needed improvement of the smoke-polluted air of cities and towns. Innumerable sanitary appliances are exhibited, and there are many interesting models.

On September 22nd, as president of the Municipal and Parliamentary section, Mr. Thomas Loftos, town clerk of Blackpool, spoke exhaustively on the responsibilities of sanitary authorities and their officers in reference to municipal and private undertakings. Any undertaking, except perhaps telephones, which directly or indirectly concerned public roads, promoted public health, provided water supply, lighted towns, or facilitated locomotion, was such as should be in the possession of a municipality, though it should be work of general public character undertaken with a view to the convenience and profit of the community.

A discussion took place in the Congregational Schoolroom on several papers, not the least interesting of which was that by Mr. George Darley, of Leeds, on the disposal of refuse; and in regard to the

Progress of Engineering

during Queen Victoria's reign, Mr. Benjamin Sykes, a North Lancashire architect, maintained that Englishmen were falling back in the race of industrial progress. The Atbara Bridge, the contract for which was given to an American firm, was delivered in six weeks. Mr Sykes further stated that he was engineer for large works in Preston where they had put down buildings and plant capable of turning out two tramway cars per day; all the woodworking machinery, engines, electric motors, and equipments were supplied from America in a remakably short time—within four months from the order being given. The buildings covered an area of between three and four acres. Then on the opposite side an English syndicate had secured eleven acres of land in connection with railways on Preston Dock. They were erecting four acres of buildings for the manufacture of electric equipment, which would be, when completed, the finest works of their kind in the United Kingdom. The roofing and girders were being made in Belgium, the machinery and electric equipment in America, and the engines, boilers, and castings in Bolton and Preston.

Dr. C. J. Whittaker read a paper on the purification of sewage by microbes; and Dr. Hartley Simpson, of Manchester, in another paper, declared in favour of cremation as the most sanitary method of disposing of the dead.

The Smoke Nuisance.

Dealing with the smoke nuisance, Dr. Graham, medical officer of Middleton, said that this had followed in the train of Watt's improvement of the steam engine at the dawn of the century. It was felt in Manchester in 1801, the records of the Court Leet showing heavy fines of owners of factories. The atmospheric impurities were preventable. The evil effects were deterioration of health, destruction of natural and architectural beauty, separation of classes, and increased financial expenditure. The loss of sunlight was a most potent factor. Attention, in our large towns, had been drawn to the dangers by the medical profession; and it had been established as clearly as any law of physics that a manufacturing district might be freed from black smoke, but action was not in accord with knowledge. For many years the community had been instructed on the proper principles on which mechanism for complete combustion could be constructed. The report of the committee formed in Manchester in 1889 showed as a result of observations of 179 chimneys a general average of 102 minutes in ten hours. With coking stokers the average was 16 minutes, but with sprinkling stokers over 100. Since the publication of that valuable report a few new appliances had been brought before the public, also smokeless fuel, but there were sufficient already to enable manufacturers to comply with the law. With regard to the practice of sanitary authorities in dealing with the smoke nuisance there was a great want of uniformity. Voluntary efforts to suppress the nuisance led to the formation of a society in Manchester in 1842, presided over by Lord F. Egerton. Glasgow, Sheffield, Leeds, Manchester, Middleton, and recently London had formed committees to cope with it. One of the principal sources of smoke was from house chimneys. It was less dense than that from factory chimneys, and the smoke was more diffusable and less under control. The evil might be greatly reduced by stoves, and where gas could be cheapened it should be used as a fuel, on grounds both of economy and cleanliness, as it was without smoke. In Birmingham the late Dr. Lawson Tait claimed a saving of £200 per annum in his establishment by its use. The subject of smoke prevention was an important though difficult one for medical officers of health and sanitary inspectors. The methods might be sufficient, but the law was lax, and a better administration of the Public Health Acts should be provided for; and to bring about this a determined pressure on the part of the community was required; he hoped they would not see the present century end without reasonable protection from such a great evil.

Public Health Laws.

On Saturday, September 23rd, the members of the Engineering and Building Construction Section visited the docks and the electric railway and tramway works at Preston. In the course of a paper on "The Codification of Public Health Laws," Mr. H. Brevitt (town clerk of Wolverhampton) pointed out that since the passing of the Public Health Act many important changes had taken place in the law, which had rendered it very desirable that something in the character of a codification should be effected in order to change existing chaos into system and order. "The Law as to Sanitary Conveniences" was dealt with by the town clerk of St. Helen's (Mr. G. W. Bailey), who proposed that the general meeting of the Congress should be recommended to pass a resolution calling the attention of the Local Government Board to the defects in the statutory provisions relating to sanitary conveniences, with a view to their being remedied. Mr. C. L. Hartley, B.A., barrister, of London, read a paper on "Humidity and Ventilation in Factories;" and Mr. W. J. Orsman, public analyst, Wigan, gave some "Notes on the Treatment of Sewage." A paper on "The Sanitation of the Mosaic Law," by the Very Rev. Dr. Adler, the Chief Rabbi, was also read.

Shifnal Builders' Failure.—On Tuesday last week at the Madeley Bankruptcy Court, Messrs. John Bradney, Harry Lloyd, and William Tappington, who have traded at Shifnal as builders, appeared for their public examination. In the statement of affairs the liabilities are put at £3,251, and the assets estimated to produce £2,305. Mr. Bradney stated that they had some heavy losses on contracts, and these, as well as the rise in the price of materials and labour, ended in a collapse of the business. The examination was formally adjourned.

Builders' Notes.

Building Houses on Damp Soil: Fine Imposed.—On September 18th, the York magistrates heard the case in which Cyrus Birkill, builder, was summoned at the instance of the City Engineer (Mr. A. Creer), for a breach of the building by-laws. There were ten separate informations in respect of ten new houses in Kensington Street, Bishopthorpe Road, but the offence charged in each was the same, namely, that the defendant had not caused the whole of the ground surface or site to be properly asphalted or covered with good cement concrete, which was required by the dampness of the site.—The Town Clerk, in his opening remarks for the prosecution, asked the Bench to impose a substantial penalty if they found the case proved. Unless this were done, it would be cheaper for any builder to evade the bye-laws, and be fined. Several building sites in York had a very damp subsoil, and it was absolutely necessary that they should be concreted. He called the City Engineer, who stated that the plans of the houses were passed provided that the site should be covered with 6in. of good concrete. The concrete which had been put down was of an inferior quality of cement, and the material was unclean. He produced a sample taken from one of the houses, which was black, and was easily broken by the chairman of the Bench with his fingers. John Oglesby, building inspector, also gave evidence. Mr. Carter, for the defence, said he should call expert evidence to show that the concrete was good, and sufficient for a damp site. Mr. Chapman de Burgh, for whom the defendant built the houses, had expressed himself satisfied with the work; the architect whom Mr. Chapman de Burgh had employed would tell them he was prepared to pass it, and there had been no complaints from the tenants. After several witnesses had been called, Mr. D. S. Mackay (chairman of the Bench) said the opinion of the magistrates was that the sample was not concrete at all. The case was a bad one, and defendant would be fined £1 and costs for each of the ten houses.—The defendant was allowed a month in which to put in proper concrete.

"Bricks Made in Germany."—At Bow Street Police Court on Monday, last week, Sir F. Lushington sat specially in the Extradition Court for the further hearing of an adjourned summons against T. W. W. Jee, A. E. Smith, A. Legge, J. L. Schiefer, and John Haggis, charging them with conspiring to obtain a bill for £50, a cheque for £10, and a quantity of bricks and cement, from Paul Borsch, of Chancery Lane.—The complainant imports bricks from Germany, and sells them on commission. In October last he arranged with the defendants Jee and Smith, who are estate agents, to pay them a commission on all orders obtained through them, and they introduced him to the other three defendants, who are builders, and who gave him orders. Trade references were given with their orders, and a report from Stubbs's Agency, and the complainant supplied part of the bricks on bills for £50 being advanced him to pay for lighterage. The bricks were not paid for, however, and the complainant now alleges that he has been deceived by part of Stubbs's report being kept back from him, and that the three builders were not in a position to entitle them to credit. On the last occasion it was shown, however, that the bricks he supplied had been condemned by two district councils, and that Schiefer had been fined over £100 for using them, while a previous summons charging Smith with fraud in this matter had been withdrawn on payment by him of £60. Arthur Pamphlett, one of Stubbs's representatives, said that in their reports respecting the three builders they recommended that all transactions with them should be on a cash basis.—After further evidence, Sir F. Lushington said that as regards the three defendants, Legge, Schlefer, and Haggis, there was not one tittle of evidence that they knew anything of the proceedings of Jee and

Smith, and they would be discharged at once. With regard to Jee and Smith, he did not consider that any case had been made out on which a jury would convict, and they, too, would be discharged.

Masters and Men.

A Building Trades' Friendly Society at Derby has been formed for non-union workmen.

The Working Slaters of Musselburgh have received an advance of ½d. per hour, making 8½d.

Strike at Havana.—A strike of men employed in various industries has occurred at Havana. Twelve thousand men are now out.

The Joiners of Dunfermline have succeeded in obtaining an advance of ½d. per hour on their wages, which are now 8½d. per hour.

Newport Building Trade Dispute.—Workmen state that only 150 members of the various men's lodges, are now left in the town, the remainder having obtained employment through their societies elsewhere.

The Carpenters and Joiners of New York have declared a general strike for an increase in wages. Six thousand men are affected. It is the largest strike in the trade that has occurred for a dozen years.

The Plasterers of Bristol Struck Work on Saturday, owing to the masters refusing their demand for an increase of a halfpenny per hour. The masters, under the new rules, ask for six months' notice of demand for any increase of wages.

The Dispute in the Building Trade at Grimsby, which has been a somewhat lengthy one, has been definitely settled by the decision of the Master Builders' Association to accede to the bricklayers' request for 9d. per hour instead of 8d. During the dispute about 100 bricklayers secured employment in other towns, but it is expected that many of them will now return.

Ironworkers Demand Higher Wages.—The Scotch ironmasters have received a circular from the Scotch Amalgamated Society of Steel and Ironworkers demanding ten per cent. advance in wages. The men hold they are paid less than their brethren in the North of England, who work only eight-hour shifts against twelve-hour in Scotland. The masters will resist the demand.

The Hull Building Dispute.—The number of members of the Joiners' Society now receiving strike pay is about 100, and they are receiving 22s. a week; there are between seventy and eighty builders' labourers out; and there have not been more than a dozen bricklayers on the books for some weeks past. It is reported that two Hull master builders have seceded from the Masters' Association, and it is regarded as quite probable that others will follow suit, and thus assist to bring about a settlement of the long-existent dispute.

The Building Trade Dispute at Leeds.—At a recent meeting of the Leeds branch of the Manchester Order of Bricklayers, the building trade dispute, so far as it related to Leeds, was briefly discussed, and it was decided that the attitude of the Manchester Order should remain the same as it has been throughout the struggle. The members of the Manchester Order, it will be remembered, have remained at their employment. The London Order, on the other hand, ceased work at the beginning of the crisis. A few weeks ago the Yorkshire Federation of Master Builders thought that a settlement might be effected by granting to them an advance of ½d. an hour, but this recommendation on being brought before the Leeds employers themselves was rejected, so that matters at present are in practically the same condition as was the case at the outset. A large number of the members of the London Order, however, have obtained work elsewhere.

A Strike Amongst the Plasterers at Nottingham has just occurred. The men complain that some members of the Master Builders' Association have been employing bricklayers to do plasterers' work, and with this grievance as a basis some fifty or sixty of them, all of whom are employed by federated employers, handed in their notices a week ago. These expired on Saturday, and nothing further having been said by the employers the men left work. There is no prospect of a spread to any other branches, at any rate at present, and the dispute does not assume large proportions. Certain firms in Nottingham have been put upon the "black list" by the National Association of Operative Plasterers, and as a result the bricklayers have still been employed and have done their work, it is reported, in a satisfactory manner.

The Engineers and the Trades Union Congress.—In the report of the Amalgamated Society of Engineers for September, Mr. G. N. Barnes, the General Secretary, has a final word with regard to the expulsion of the Amalgamated Society of Engineers from the Trades Union Congress. He says: "We have received shoals of letters, mainly from branches, but some from individuals both inside and outside our ranks, and all endorsing the line we have taken in the matter. Trade Unionism cannot exist as a beneficent force in the nation if it is to consist of a heterogeneous collection of bodies mutually exclusive and antagonistic to one another and to everyone outside of their own borders, and so long as the men who control the Congress regard it as such we must remain outside. We believe in Trade Unionism as something which should intelligently gather up and focus working-class opinion as a whole, harmonising its various phases as far as possible, and making it effective in the interests of all labour. If our quitting the Congress will conduce to that, such quitting will prove of greater service to labour than anything done during our thirty-two years' connection."

The Building Trade Dispute in Leicester.—Sir William Markby, acting as Board of Trade arbitrator made his award last Saturday, on the dispute in the Leicester building trade. The matter referred to him for decision arose out of a demand of the Builders' Labourers' Society, Leicester, and of the Navvies, Bricklayers' Labourers, and General Labourer' Union, Leicester Branch, for an advance of wages of 1d. per hour. The subject matter of the dispute is stated in two applications, one addressed by Mr. Thomas Stevens to Mr. W. E. Starkey, and the other addressed by Mr. J. W. Morris also to Mr. Starkey. The present dispute relates to the bricklayers' labourers only. By rule 1 of the working rules of the Builders' Labourers' Society, by which the Navvies, Bricklayers' Labourers, and General Labourers' Union were also governed, the standard rate of wages for bricklayers' labourers was fixed at 6d an hour, and Sir W. Markby was asked to alter that demand to 7d. His award was that the rate of wages should henceforth be 6½d. an hour, and with regard to the re-instatement of the men on strike, he directed: "That the master builders shall reinstate all their old workmen at as early a date as possible, and before putting on any new hands; and that the bricklayers' labourers shall not interfere with any men at present employed, except by using any legal means to induce such of them as are not members of either of the above-mentioned labourers' unions to become so." The award will be carried out by both parties.

Engineering Notes.

Naval Extension Works at Devonport.—It is stated that the Admiralty have decided upon a scheme of naval extension works at this dockyard, second only in importance to the Keyham Dockyard extension.

The Cottage Hospital, Lytham, is being warmed and ventilated by means of Shorland's patent Manchester grates and special inlet tubes, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Electric Lighting at Epsom.—A Local Government Board inquiry was held at Epsom on Thursday, into the application of the Urban Council for permission to borrow £16,000 for electric lighting purposes.

Lawrenny Castle has just been fitted by John King, Limited, engineers, Liverpool, with their latest improved "Small Tube" hot water heating apparatus with special economical coil heater and water way firebars.

The Lighting of Newcastle.—At a special meeting of the Lighting Committee of the Newcastle Corporation, held on September 18th, it was unanimously agreed to recommend the City Council to light by electricity all the streets in the city through which the new tramways are to run.

Institution of Electrical Engineers.—Professor Silvanus P. Thompson, President, and Professor W. E. Ayrton, Past President, having been invited to take part in the Volta celebrations at Como, have been chosen by the Council to represent the Institution as delegates on this occasion.

Electric Lighting for Newark.—A special meeting of the Newark Town Council was held on September 18th, to receive a recommendation of the Electric Lighting Committee on the supply of electricity to the borough, and as to an application for a provisional order. Mr. W. E. Knight stated that the probable cost of the scheme would be £16,000. After a lengthy discussion, it was decided to apply for a provisional order, and to have a public meeting of ratepayers.

A New Tunnel.—Under the River Spree, at Berlin, there is now being constructed the first subaqueous tunnel in Germany. It is intended to accommodate a tramway route connecting the Silesian railway station with the suburb of Treptow, and has a total length, including approaches, of 2020ft., 1500ft. of which constitute the tunnel proper. Since the introduction of iron as a substitute for the older stone or brick linings of tunnels, the usual method has been to construct them of cast-iron segments, bolted together through flanges and lugs provided for the purpose. In the tunnel under the Spree cast-iron is discarded in favour of steel, which forms a cylindrical casing, having an internal diameter of 13ft. 2in. The lowest part of the tube is 35ft. beneath the mean water level of the river, so that, given a depth of water of 11ft., there remains a thickness of the same amount between the upper part of the tunnel and the bed of the stream. Steel plates 2ft. 3in. in length, with their butt joints covered by double angle steels, are built up to form the lining, and are protected externally from corrosion by a thick layer of cement. In the lower part, or invert, concrete is used to bring the floor of the tunnel up to track level, below which is laid a longitudinal drain to carry off any water that might accumulate, which will be pumped out as required by electric power. The piercing of the tunnel was effected by the shield and compressed air (as with the Blackwall Tunnel) through strata composed of mud and dirty sand, the maximum hydraulic pressure available amounting to nine hundred tons. The work was commenced in 1895, and it is expected that the tunnel will be opened for traffic next year.

Surveying and Sanitary Notes.

Straw Paving.—A Berlin patent agency announces that a Polish engineer has discovered a method of chemically treating straw, so that it can be pressed into a substance as hard as stone and cheaper than wood-paving, for which it is expected to prove a substitute.

Otley's Sewage Disposal.—Mr. R. H. Bicknell, M.Inst.C.E., on behalf of the Local Government Board, last week conducted an inquiry into an application by the Otley District Council for sanction to borrow £4,500 for the purposes of sewerage and sewage disposal works.

Ripon Street Improvements. — An inquiry was held at the Town Hall, Ripon, on Wednesday, by Mr. R. H. Bicknell, M.Inst.C.E., with respect to an application by the Corporation of Ripon to borrow £3,060 for the widening of Fishergate, one of the three parallel and narrow streets leading from the Market Place into North Street.

Dinas Powis Sewage.—Mr. H. P. Boulnois, inspector to the Local Government Board, held an inquiry at Dinas Powis recently, with reference to the application of the Llandaff and Dinas Powis Council for sanction to borrow £11,000 for the purpose of sewerage works for the parish of St. Andrew's. The proposed outfall is in the parish of Sully. Opposition was raised to the proposed plan by the Barry District Council and several local landowners.

Proposed Improvements at Worcester.—Colonel A. J. Hepper, Local Government Board Inspector, held an inquiry, on Tuesday, last week, at the Guildhall, Worcester, into the proposal of the Council to borrow £16,250 and £800 for the purchase of land for street improvements.—Mr. S. Southall (town clerk) explained that the £16,250 was for the purchase of land in High Street for the widening of the thoroughfare opposite the Old Bank and extending to the Cross. The £800 was for the acquirement of land to complete Trinity Street and extend it to St. Nicholas Street.

London Main Drainage and Storm Flooding.—Mr. Frank Dethridge, vestry clerk of Paddington and president of the Metropolitan Local Government Officers' Association, has, at the instance of his vestry, addressed a letter to the London local authorities north of the Thames, inviting them to send delegates to a conference, to be held at Paddington Vestry Hall early next month, for the purpose of "urging upon the London County Council the absolute necessity of at once taking steps to improve the main drainage system north of the river, and thus prevent flooding of the basements of houses in the low-lying districts in time of storm."

Bath Sanitary Committee.—At the fortnightly meeting of this committee, held on September 18th, a discussion arose about some rooms in Somerset Street having windows that could not be opened at the top, the question being as to whether proceedings should be taken. The Medical Officer and the Inspector thought this deficiency of light and ventilation was injurious to health, but the former admitted that the case was not a strong test one. It was agreed that the officers should select the strongest case they could find, in order that proceedings might be taken. The new bye-laws, it was stated, contained a clause to the effect that all windows in new houses should open at the top.

Sewage Works for Halifax.—The construction of new sewage works for Halifax has been commenced. The estimated cost of the whole scheme is between £50,000 and £60,000. The work is being carried out in sections, and already two contracts have been let. No. 1 contract involves the diversion of the Hebble Brook, which passes through the site of the intended sewage tanks at Salterhebble, the amount of the tender being about £3,000. Alderman Walsh, chairman of the Highways Committee, recently laid a corner stone in connection with this portion of the scheme. The contractors (Messrs. Bower) presented him with a handsome trowel and mallet. The Corporation have also accepted the tender of Messrs. Bower for the works required in building eleven precipitating tanks, two sand tanks, and one receiving tank, and for carrying out appurtenant works at a cost of £12,800. The combined capacity is 3,706,000 gallons—somewhat above the ordinary flow of sewage in twenty-four hours—and, on the eight hours rest system, more than 10,000,000 gallons can be treated per day. The tanks are to be arranged so that they can be filled with sewage from an inlet about 3ft. below the surface, in order that the sewage may be treated in the open tank; or, if found necessary at any future time, the tanks may be covered over, and the sewage treated upon the septic tank system, which is applied to a portion of the domestic sewage at Exeter. They are also so arranged that by slight alterations and additions any chemical treatment may be applied.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—		
Sept. 29	Aberystwyth—Addition to House	Mrs. Kensit	Hipkiss and Bassett, Architect, Terrace-road, Aberystwyth.
,, 29	Chelmsford—Schoolroom and Offices		C. Pertwee, Architect, Bank-chambers, Chelmsford.
,, 29	Elgin—Additions to Golf Clubhouse		A. and W. Reid and Willett, Architects, Elgin.
,, 29	Hereford—Renovating Cottage	Standing Joint Committee	A. Dryland, County Surveyor, Hereford.
,, 29	Margate—Coastguard Buildings	Admiralty	Director of Works Department, 21, Northumberland-av., W.C.
,, 30	Hallwill, Devon—Cottage Hospital		C. F. A. Voysey, 6, Carlton Hill, N.W
,, 30	Arundel, Sussex—Billiard Rooms		Wheeler and Lodge, Architects, Horsham.
,, 30	Bodmin—Alterations, &c., to Hotel	W. Hicks	T. H. Andrew, 1, Trevarrick-villas, St. Austell.
,, 30	Cardiff—Branch Library	Corporation	E. M. B. Vaughan, Borough-chambers, St. Mary-st., Cardiff.
,, 30	Dartmouth—Boundary Walls	Corporation	T. O. Veale, Surveyor, Town Hall, Dartmouth.
,, 30	King's Lynn—Workshop and Stores	Waterworks Committee	H. J. Weaver, Engineer, Town Hall, King's Lynn.
,, 30	Lochboisdale, Scotland—Additions, &c., to School	Barra School Board	Hill, Banker, Lochboisdale.
,, 30	Pontefract—House, Outbuilding, &c.	J. E. Poppleton	Tennent and Bagley, Architects, Ropergate, Pontefract.
Oct. 1	Cymmau, Wales—Alteration to Chapel		W. Lewis, Cymmau.
,, 2	Sowerby Bridge, Yorks—Nine Houses		M. Hall, 29, Northgate, Halifax.
,, 2	Handsworth, Staffs.—Stabling, Workshops, &c.	Urban District Council	E. Kenworthy, Engineer, Council House, Handsworth.
,, 2	Erith, Kent—Schools	School Board	W. Egerton, 12, Queen's-road, Erith, Kent.
,, 2	Hastings—Stabling, Loose Boxes, &c.	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
,, 2	Luton—Engine House and Engine Foundations	Brompton, Chatham, &c., Waterworks Company.	J. Taylor, Sons, and S. Crimp, 27, Great George-street, S.W.
,, 2	Burton-on-Trent—Alterations, &c., to Cottages	Corporation	G. T. Lynam, Engineer, Town Hall, Burton-on-Trent.
,, 2	Culoville, Ireland—Two Double-storey Cottages	Great Northern Railway, Co.	Company's Engineer-in-Chief, Amiens-st., Terminus, Dublin.
,, 2	Londonderry—Boundary Walls, &c.	Brooke Trustees	M. A. Robinson, Architect, Richmond-street Londonderry.
,, 3	Colwall, Herefordshire—Station Buildings, &c.	Great Western Railway Co.	Engineer, Gloucester Station.
,, 3	Didcot—30 Cottages	Great Western Railway Co.	Engineer, Reading Station.
,, 3	London, W.—Station	G. W. & Metropolitan Rlys. Joint Committee	Engineer, Paddington Station.
,, 3	Omagh—Church Spires	Very Rev. Monsignor M'Namee, P.P.	W. Hague, 50, Dawson-street, Dublin.
,, 3	Basingstoke—Fifteen Cottages	Housing of the Working Classes Committee	G. Fitton, Borough Surveyor, Town Hall, Basingstoke.
,, 3	Lewes—Alteration and Extension of County Hall	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes.
,, 3	Watford—Offices and Warehouse	Benskin's Brewery, Limited	C. P. Ayres, 14A, High-street, Watford.
,, 3	London, S.E.—Underground Urinal	County Council	Architect's Department, 13, Spring-gardens, S.W.
,, 4	London, S.W.—Electric Generating Station	St. Mary's Vestry, Battersea	W. M. Wilkins, Clerk, Municipal-bldgs, Lavender Hill, S.W.
,, 4	Bucknall, Lincoln—Enlargement of Classroom, &c.	School Board	A. E. Applewhite, Clerk, Bucknall, Lincoln.
,, 4	Leytonstone—Oak Fence	West Ham Union Guardians	F. E. Hilleary, Clerk, Union-road, Leytonstone.
,, 5	Hastings—Rebuilding, &c., Electric Light Works	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
,, 5	Hastings—Chimney Shaft	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
,, 5	Sheffield—Hospital	Corporation	Flockton, Gibbs and Flockton, 15, St. James-row, Sheffield.
,, 6	Dublin—Addition to National Gallery of Ireland		H. Williams, Office of Public Works, Custom House, Dublin.
,, 6	Ynysybwl, Wales.—Classroom	Llanwonno School Board	A. O. Evans, Architect, Pontypridd.
,, 7	Cardiff—Branch Library	Corporation	Feather and Wilson, Andrews-bldgs., Queen's-st., Cardiff.
,, 7	Whitchurch, Devon—Repairs to Vicarage and Glebe		Vicar, Whitchurch, Devon.
,, 7	Horsham—Additions and Alterations		C. H. Burstow, 6, West-street, Horsham.
,, 10	Barking, Essex—Greenhouse	Urban District Council	C. J. Dawson, Council's Surveyor, Public Office, Barking.
,, 10	Brighton—Engine and Boiler Houses, Chimney Shaft &c.	Corporation	F. J. Tillstone, Town Clerk, Town Hall, Brighton.
,, 10	Birkenhead—Electricity Generating Station	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
,, 10	London, W.—Post Office Savings Bank	Commissioners of H.M. Works	H. Tanner, Office of Works, Storey's Gate, S.W.
,, 11	Tooting, S.W.—Asylum	Metropolitan Asylums Board	A. and C. Harston, 15, Leadenhall-street, E.C.
,, 11	Hackney, N.E. Alterations, &c., to Public Baths	Vestry	Gordon, Lowther & Gunton, Finsbury-ho, Bloomfield-st., E.C
,, 11	London—Works, Repairs, and Materials	War Department	Royal Engineer Office, 41, Charing Cross, S.W.
,, 12	Wolverhampton—Workhouse Infirmary	Union Guardians	A. Marshall, Architect, King-street, Nottingham.
,, 13	Leicester—Cemetery Buildings, &c.	Corporation	Goddard and Co., 6, Market-street Leicester.
,, 16	Kingwood Hill, near Bristol—Engine House and Foundations.	West Gloucestershire Water Co.	E. D. Marten, Engineer, The Birches, Codsall, Wolverhampton.
,, 17	London, S.E.—Alterations, &c., to Workhouse	St. Olave's Union Guardians	Newman and Newman, 31, Tooley-street, E.C.
,, 18	Isleworth—Workhouse	Brentford Union Guardians	W. Stephens, Clerk, Union Offices, Isleworth, W.
,, 25	Swansea—Extension of Workhouse	Union Guardians	G. B. Haynes, 8, Fisher-street, Swansea.
No date.	Homerton—Rebuilding Lavatories	Perseverance Club and Institute	T. Jones, Secretary, 17 and 19, Church-road, Homerton.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		ENGINEERING—		
Sept.	29	King's Norton, near Birmingham—Thresh Disinfecter	Urban District Council	E. Docker, 10, Newhall-street, Birmingham.
,,	29	Roughton, Norfolk—Tube Well	Urban District Council	A. F. Scott, Surveyor, Church-street, Cromer.
,,	30	Seaford, Sussex—Extension of Outfall Pipe	Urban District Council	W. H. Pawson, 3, Clinton-place, Seaford.
,,	30	Handsworth, Staffs.—Gas Engines and Pumps	Urban District Council	E. Kenworthy, Engineer, Council House, Handsworth.
,,	30	Winwick, near Warrington—Electric Lighting	Asylum Committee of Visitors	J. P. Muspratt, Clerk, County Offices, Preston.
,,	30	Nottingham—Pipelaying	Water Committee	General Manager, WaterDepart., St. Peter's-sq., Nottingham.
Oct.	2	Bagillt, Wales—Tunnel	....	Engineer, Holywell-Halkyn Tunnel, Dee Bank, Bagillt.
,,	2	Cromer—Pier Sea Walls, &c.	Protection Commissioners	Douglas and Arnott, 15, Victoria-street, Westminster, S.W.
,,	2	Huddersfield—Five Boilers	Corporation	A. B. Mountain, Borough Electrical Engineer, St. Andrew's-road, Huddersfield.
,,	2	Newtonstewart, Ireland—Steel Footbridge	Great Northern Rly. Co. (Ireland)	Co's Engineer-in-Chief, Amiens-street, Terminus, Dublin.
,,	2	Westbury, Wilts.—Reservoirs, &c., at Waterworks	Rural District Council	W. H. Stanley, Engineer, Market House-chbrs., Trowbridge.
,,	2	East Dereham—Sluice Valves	Urban District Council	H. G. Himson, Surveyor, Theatre-street, East Dereham.
,,	3	Blackpool—Widening Railway	Lancs. & Yorks. & L.N.W. Joint Rlwys.	Engineer, Hunt's Bank, Manchester.
,,	3	Blackpool and Kirkham—Railway	Lancs. & Yorks. & L.N.W. Joint Rlwys.	Engineer, Hunt's Bank, Manchester.
,,	3	Sligo—Heating and Ventilating Asylum	District Lunatic Asylum Managers	Sir T. N. Deane and Son, 3, Upper Mervion-street, Dublin.
,,	4	Doneraile, Mallow—Waterworks	Mallow District Council	Engineer, Council's Board Room, Mallow, Ireland.
,,	4	Mallow, Ireland—Sinking Wells	Rural District Council	M. Regan, Clerk, Council's Board Room, Mallow.
,,	6	Blackpool—Extension of Jetty	Pier Company	J. Walker, Secy., Old Bank-chmbrs., Talbot-sq., Blackpool.
,,	6	West Bridgford, Notts.—Septic Tank	Urban District Council	W. Pare, George-road, West Bridgford.
,,	7	Cork—Sinking Wells and Erection of Pumps	District Council	J. Cotter, Clerk, Board Room, Workhouse, Cork.
,,	9	Tynemouth—Reservoir	Corporation	J. Mansergh, 5, Victoria-street, Westminster.
,,	9	Rotherham—Electric Lighting	Corporation	H. H. Hickmott, Town Clerk, Rotherham.
,,	10	Glasgow—Switchboards, Travelling Cranes, &c.	Corporation	J. Young, 88, Renfield-street, Glasgow.
,,	10	Wapping—Alterations to Swing Bridge	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
,,	10	Londonderry—Waterworks	Council	J. J. S. Barnhill, 1A, Strand, Londonderry.
,,	10	Glasgow—Electric Switchboard, Cranes, &c.	Corporation	J. Young, 88, Renfield-street, Glasgow.
,,	10	London, S.W.—Alteration of Bridge Swinging Gear	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
,,	10	Londonderry—Extension of Waterworks	Council	J. J. S. Barnhill, 1a, Strand, Londonderry.
,,	10	Glasgow—Reconstruction of Tramways	Corporation	J. Young, 88, Renfield-street, Glasgow.
,,	11	Warminster—Pipelaying	Urban District Council	A. F. Long, Town Engineer, Warminster.
,,	14	Tiflis—Tramways Concession	Town Council	Managing Department of Council, Tiflis, Transcaucasus.
,,	18	Leeds—50 Electric Tramcars	City Council	T. Hewson, City Engineer, Municipal Buildings, Leeds.
,,	18	Purton, Wilts—Waterwoks	Rural District Council	F. Redman, Engineer, Newport-street, Swindon.
,,	24	Barking, Essex—Light Failway Plant	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
,,	30	Port Elizabeth—Railway	....	General Manager of Railways, Capetown.
Nov.	3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
Jan.	4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
		IRON AND STEEL—		
Sept.	30	Warrington—Pipes, &c.	Corporation	J. Deas, Engineer, Bank House, Warrington.
,,	30	Earlstown, Lancs.—Pipes	Newton-in-Makerfield Urban Dis. Council	W. W. Shirley, Clerk, Town Hall, Earlestown.
,,	30	Horsham—Fencing, Pipes. &c.	Burial District Joint Committee	R. Henwood, 17, London-road, Horsham.
Oct.	2	London, N.—Fencing	Edmonton Urban District Council	G. E. Eachus, Engineer, Town Hall, Lower Edmonton, N.
,,	2	Sunbury-on-Thames—Fencing for Cemetery	Urban District Council	H. F. Coales, Surveyor, Council Offices, Sunbury-on-Thames.
,,	2	London, E.C.—Railway Stores	Madras Railways Company	J. Byrne, 61, New Broad-street, London, E.C.
,,	3	London, E.—Steel Roofing, &c.	Great Western Railway Company	Engineer, Paddington Station.
,,	4	London, E.C.—Steel Underframes, &c., for Carriages	East Indian Railway Company	A. P. Dunstan, Secretary, Nicholas-lane, E.C.
,,	7	Edinburgh—Cast-iron Main Pipes	Gas Commissioners	W. R. Herring, 25, Waterlow-place, Edinburgh.
,,	11	Warminster—Pipes	Urban District Council	A. F. Long, Town Engineer, Warminster.
		PAINTING AND PLUMBING—		
Sept.	29	Cockermouth—Spouting at Workhouse	Union Guardians	French, Workhouse Master, Cockermouth.
,,	29	Manchester—Sanitary Alterations to Cottages	Joint Workhouse Committee	A. J. Murgatroyd, 23, Strutt-street, Manchester.
		ROADS AND CARTAGE—		
Sept.	29	Little Hulton, Lancs.—Road Works	Urban District Council	C. C. Hooley, 34, Brazenose-street, Manchester.
,,	29	London, N.—Making-up Roads	Wood Green Urban District Council	C. J. Gunyon, Surveyor, Town Hall, Wood Green.
,,	29	Wood Green—Road	....	Vigers and Co., 4, Frederick's-place, Old Jewry, E.C.
,,	30	Sherborne, Dorset—Steam Rolling	County Council	W. J. Fletcher, County Surveyors Office, Wimborne.
,,	30	St. Annes-on-Sea, Lancs.—Making up Streets	Urban District Council	Surveyor, Council Offices, Park-road, St. Annes-on-Sea.
,,	30	Wimborne, Dorset—Steam Rolling	....	W. J. Fletcher, County Surveyor's Office, Wimborne.
,,	30	Middlesbrough—Hiring of Steam Road-roller	Rural District Council	W. H. Dixon, surveyor, Kirby, Carlton, Northallerton.
,,	30	Wilton, Wilts—Hire of Steam Road-roller	Rural District Council	J. Goulden, District Surveyor, Wilton.
,,	30	Heath Town, near Wolverhampton—Paving, &c.	Urban District Council	R. E. W. Berrington, Civil Engineer, Wolverhampton.
,,	30	London, S.E.—Roads	....	R. Stewart, 162, Sloane-street, S.W.
Oct.	2	London, W.C.—Horse Hire	St. Martin's-in-the-Fields Vestry	G. Green, St. Martin's Town Hall, Charing Cross-road, W.C.
,,	2	Sunbury-on-Thames—Laying-out Cemetery	Urban District Council	H. F. Coales, Surveyor, Council Offices, Sunbury-on-Thames.
,,	2	Beckenham—Making-up Roads	Urban District Council	J. A. Angel, Surveyor, Council Offices, Beckenham.
,,	2	Teddington, Middlesex—Road Forming	Urban District Council	M. Hainsworth, Council Offices, Elmfield House, Teddington.
,,	2	Warrington—Forming and Paving Streets	Paving and Sewerage Committee	T. Longdin, Borough Surveyor, Town Hall, Warrington.
,,	2	Handsworth—Excavation, &c., for Widening Road	Urban District Council	E. Kenworthy, Surveyor, Council House, Handsworth.
,,	2	Windsor—Widening, &c., Road	Rural District Council	W. Menzies, Surveyor to Council, Englefield Green, Surrey.
,,	2	Handsworth, Staffs.—Stone	Urban District Council	E. Kenworthy, Surveyor, Council House, Handsworth.
,,	2	Hanwell—Broken Granite	Urban District Council	P. J. Dennis, Clerk, Council Offices, Hanwell, W.
,,	3	Carshalton, Surrey—Materials	Urban District Council	W. W. Gale, Surveyor, Council Office, High-st., Carshalton.
,,	3	Felixstowe—Road Works	Urban District Council	G. S. Horton, Surveyor, Town Hall, Felixstowe.
,,	3	Acton—Making-up Roads	Urban District Council	D. J. Ebbetts, 242, High-street, Acton.
,,	3	Catford, S.E.—Kerbing and Tar-paving	Lewisham Board of Works	Surveyor, Lewisham Town Hall, Catford, S.E.
,,	3	Brockley, S.E.—Kerbing and Tar-paving	Lewisham Board of Works	Surveyor, Lewisham Town Hall, Catford, S.E.
,,	4	Hampton, Middlesex—Granite Edge Kerb	Urban District Council	J. Kemp, Surveyor, Council Offices, High-street, Hampton.
,,	4	Victoria Park, N.E.—Hoggin, Shell, Gravel, and Flints	London County Council	Parks Department, 9, Spring-gardens, S.W.
,,	4	Leytonstone—Oak Cleft Fence	West Ham Union Guardians	F. E. Hilleary, Clerk, Offices, Union-road, Leytonstone, E.
,,	6	London, S.W.—Laying out Estate	....	W. N. Dunns, 1, Bucklersbury, E.C.
,,	18	Balby-with-Hexthorpe, Yorks.—Forming, &c., Streets	Urban District Council	G. Gledhill, Surveyor, High-road, Balby.
,,	23	Little Hulton, Lancs.—Road Improvement Works	Urban District Council	C. C. Hooley, 34, Brazenose-street, Manchester.
		SANITARY—		
Sept.	29	Patricroft, Lancs.—Tile Glazed Pipes	Barton Rural District Council	— Hooley, Engineer, Union Offices, Patricroft.
,,	30	Wicklow—Gully Grates, Stench Traps, &c.	Urban District Council	J. Pansing, Town Surveyor, Wicklow.
,,	30	Horsham—Subsoil Draining	Burial District Joint Committee	R. Henwood, 17, London-road, Horsham.
,,	30	Bakewell—Sewerage Works	Rural District Council	Sterling and Swann, Town Hall, Chapel-en-le-Frith.
,,	30	Wolverhampton—Pipe Sewers	Sewerage Committee	J. W. Bradley, Borough Engineer, Wolverhampton.
Oct.	3	Hale, Cheshire—Main Sewers	Bucklow Rural District Council	J. M'D. M'Kenzie, 7, Market-street, Altrincham.
,,	9	Leatherhead—Sewerage Works	Urban District Council	F. Beesley, 11, Victoria-street, Westminster.
,,	9	Hendon, N.W.—Bacteria Bed, Portland Cement, &c.	Urban District Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
,,	11	Warminster—Laying Sewers	Urban District Council	A. F. Long, Town Engineer, Warminster.
Nov.	10	Darton, Yorks.—Sewerage Works	Urban District Council	W. H. Radford, Pelham-chambers, Angel-row, Nottingham.

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Oct.	17	Blackpool—School for 1000 Children	....	T. Loftos, Clerk to School Board, Town Hall, Blackpool.
Nov.	30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *viâ* New York.

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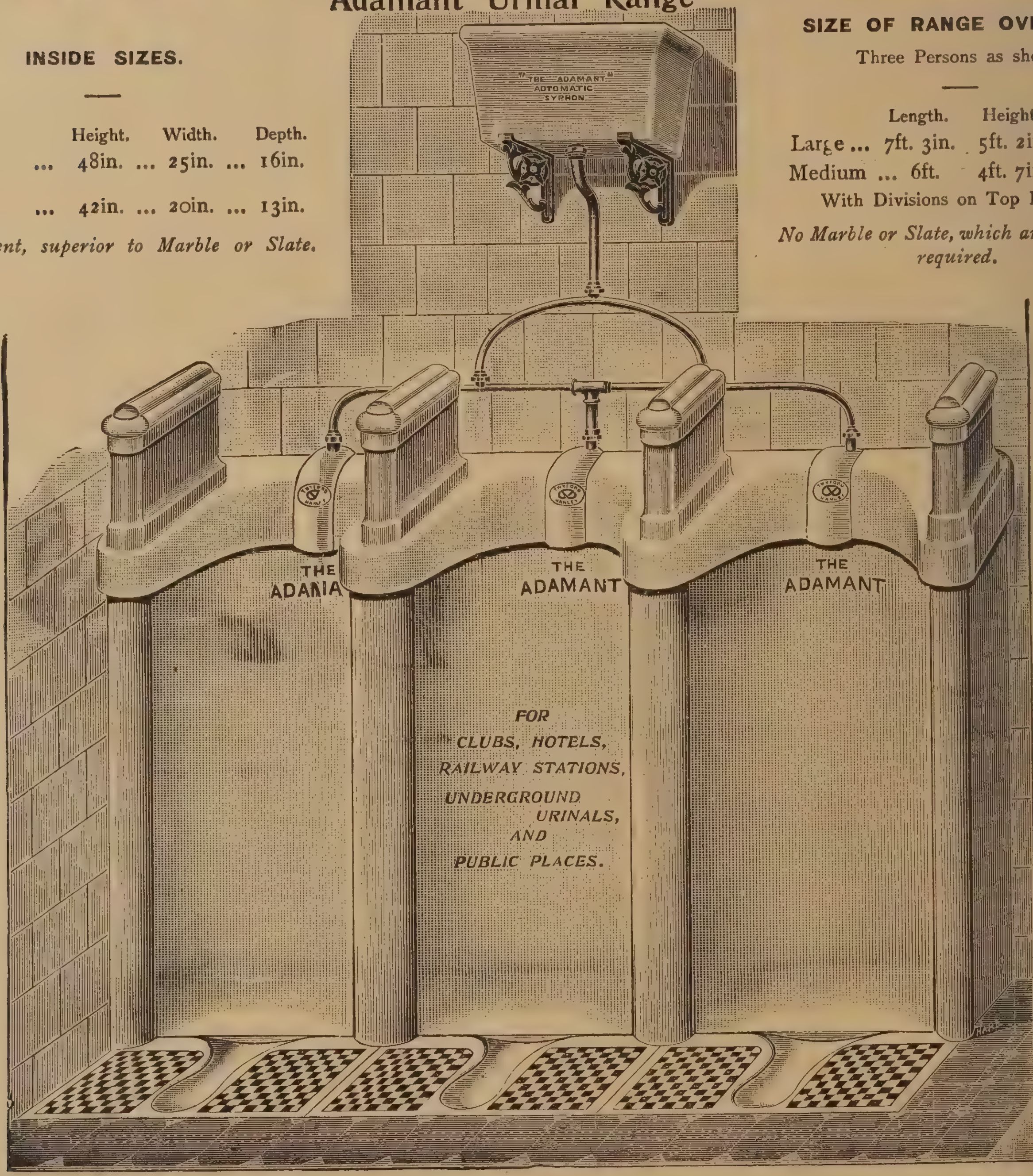
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OCTOBER 4, 1899.
No. CCXLIII.

EFFINGHAM HOUSE,
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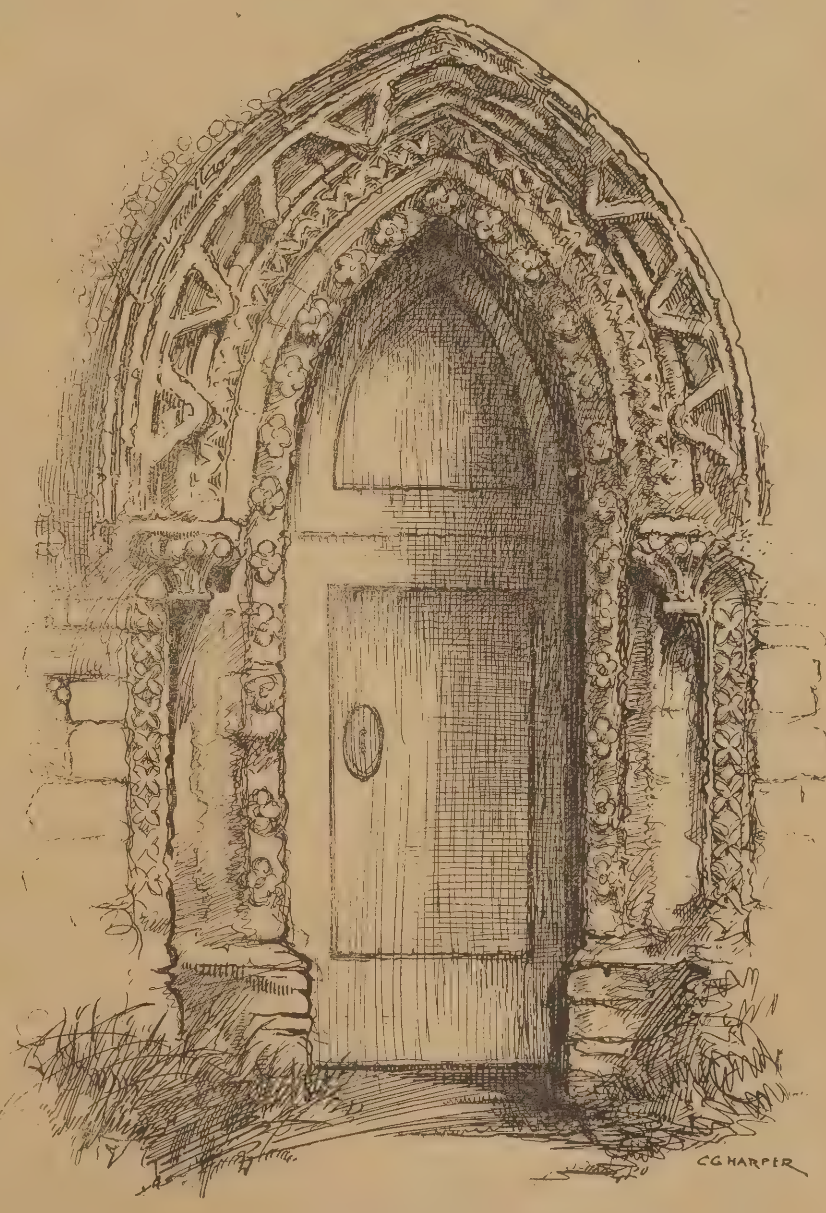
An Architectural Causerie.

Megalomania. THE passion for hugeness appears to exercise a curious fascination upon mankind, and constantly reappears at intervals in the world's history, the impressiveness which undoubtedly does attach to great masses of material, when ordered and arranged with proper consideration for proportion, being supposed to attach to the mass of material and not to the design. One can understand that in the early days of the world's history the mere size of a thing produced fear and awe, for man was not then master of weapons of destruction with which to neutralise the attack of great beasts, and to turn their onslaught into defeat; nor had he the means of controlling natural forces and making them subservient to his requirements. But all this is changed now, and it is known that the most powerful forces of Nature may be directed and controlled by relatively small instruments; yet the passion for bigness still persists.

The Greeks discovered that it was not necessary for a work of art of any kind to be huge to be impressive, and most of their temples and statues were of moderate size, though even they, the keenest and most cultivated of the ancients, occasionally erred, as witness the Temple of the Giants at Agrigentum; but their example was soon forgotten, and the barbaric delight in size and multitude of parts resumed its sway. All through the period of the Middle Ages towns were vying with each other, each striving to have the highest tower, the largest church, or the deepest toned bell in the communal belfry, and Italy, in particular, is strewn with the unfinished carcasses of abandoned ambitions. To note only two—at Bologna the traveller sees the unfinished western façade of the Church of St. Petronio, the bare rubble work of the west wall of which soars high above the beautifully finished sculpture around the doors where Jacopo della Quercia, Nicolo Tribolo, and their fellows breathed a soul into the senseless marble; and the finely proportioned interior consists solely of nave and side chapels, the building having stopped when the transepts were reached; and at Siena the cathedral nave is but the transepts and crossing of the building as originally designed, a portion of the beautiful nave arcade standing outside in the piazza to testify to the original plan. Many other instances might be quoted in which the builders evidently did not count the cost before commencing to build, or built with an unfounded faith in the extent of their resources. The same desire for the impressiveness of vastness gave us the long perspectives and spacious courtyards of such palaces as Versailles, a type of many others in France and other countries, and still gives us, on the other side of the Atlantic, the immense office buildings of New York and Chicago.



NORTH DOOR, STONE CHURCH. DRAWN BY C. G. HARPER. (*See p.* 129).

The idea that great size must necessarily imply strength appears to be ingrained in the human mind, and the first idea of every one who wishes to have a fine thing seems to be to make it big. Yet, in fact, it is not absolute but relative size which impresses, and this can only be realised by the employment of proportion and contrast, the just use of which may give the impression of majesty to a building which is comparatively small, while the immense erection with its interminable rows of windows may, lacking these, not only fail to impress, but look much less in size than it actually is. Our great hotels, which blot out the sunlight from the streets amid which they tower aloft, making them feel like wells, may gain in the efficiency of their management by their immense size, and the public rooms in such places may be more expensively decorated than would be possible in smaller establishments; but this palatial gorgeousness is a doubtful advantage to art, and certainly there are few of them which can compete, either in beauty or impressiveness, with far smaller buildings raised a couple of hundred years or more ago.

S. S. G.

The Uses and Limits of Perspective.

To judge by the large proportion of perspective, as opposed to geometric, drawings which are published in the professional papers, it would appear that architects and their assistants spend a good deal of their time in making perspective representations of the buildings which they design, while it is well known that perspective specialists are paid highly for their work, and the inquiry is natural as to what is the good of it all. At first sight it would appear to be labour entirely thrown away. To enable a building to be carried out in accordance with its design, geometrical drawings alone are necessary, and a capable designer will understand as well how his building will look when completed without as with a perspective drawing. But to the uninitiated it is different. To the average client and the average competition committee a set of geometric plans, sections, and elevations is entirely incomprehensible, while a well prepared perspective appeals at once.

Even the plan would probably be far better understood if it were set out in isometric projection, showing the walls some few feet high; but instead of this, the attractive perspective drawing has been developed, and the time expended on its production has been found in numberless instances to have been well laid out. Its use is for the purpose of advertisement, to speak plainly; for its artistic merit is not great, exemplifying rather the skill of the draughtsman than the art of the designer and creator when at its best, while at its worst it is capable of giving false impressions, being easily "cooked," allowing of the subjugation of bad features and the undue emphasising of good ones, and almost always being accompanied by wholly fanciful drawing of surrounding scenery.

Then, again, each view can only give one aspect of the building, as it will be seen from one point only; and it is by no means an unknown thing for a draughtsman to select a wholly impossible point of view, choosing it because, theoretically, that alone would give a pleasing result. The note to be sounded, therefore, is one of caution and distrust. A perspective may be truthful, may give a really good representation of the finished building and its surroundings, and it may even be helpful to its designer in showing him where improvements either of detail or of grouping could be effected; but it may be, and more often is, utterly false, a draughtsman's exaggeration, or even a draughtsman's lie, open to the most definite condemnation. All the same, perspective drawing should not be neglected. He who possesses a full understanding of it can often assist himself when in doubt in designing, by sketching the doubtful group or the doubtful detail as he expects it to be seen; he can at times express to a workman his meaning as to a piece of construction, as a mere geometric draughtsman cannot do; and he can detect the lie, if such be there, in the tricky sketch of another. But he must avoid the lie himself, as strictly as he would avoid the spoken lie.

G. A. T. M.

On Reflection.

Building By-Laws in Rural Districts.

THERE has long been a strong feeling amongst architects and builders whose practice lies chiefly in rural districts that the building by-laws enforced by the Local Government Board are unnecessarily—even mischievously—restrictive. There have lately been indications that District Councils are beginning to take the same view. In Dartford, Eynsford, and Sutton-at-Hone, the local councils have been in communication with the Local Government Board on the subject, and have secured certain concessions which, though still inadequate, will serve very well as a starting point. The Board has sanctioned the building of one-storey cottages or bungalows, provided they do not exceed 600ft. in superficial area and 6,000ft. in cubic capacity, and provided, also, that they are separated from each other by a space of not less than 200ft. Obviously these restrictions greatly detract from the value of the concession, and it is difficult to see their necessity. The Local Government Board is naturally and rightly unwilling to sanction any building methods which tend to increase the danger to life and property through fire, and one can readily appreciate the desirability of limiting the height of wooden buildings; but the necessity for limiting the superficial area is not so apparent. The stipulation for an interspace of 200ft. seems altogether excessive, and effectually prevents the use of these buildings for the purposes they are generally intended to serve, namely, for agricultural labourers' dwellings. It is obviously impossible to provide a 200ft. frontage for a cottage which is to be let at 3s. or 4s. a week. We hope the councillors of these Kentish parishes will keep pegging away until a concession of really practical value is obtained. The authorities of the Local Government Board are apt to look with suspicious eyes upon representations made by architects and builders who are desirous—primarily, of course, in their own interests—to be allowed to build in the cheapest materials. But when similar appeals are made to them by disinterested bodies representing the public as a whole, the desired reform will not—we may fairly hope—be much longer delayed. If it is to the architect's advantage that he should be allowed, without vitiating restrictions, to build small wooden dwellings in country districts, it is not less to the advantage of the agricultural labourer for whom such dwellings are intended. Cheap construction means low rent, and increased opportunity for the occupier to become the owner of his house. Moreover, a wooden bungalow standing in an ample plot of ground may well be far more healthy and comfortable than a cottage in a terrace with only a few feet of garden at the rear.

Ancient and Modern Building.

UPON turning to the writings of old historians and chroniclers, we are told how our forefathers erected their churches and abbeys, and though their rate of progress would doubtless raise the modern speculator's mocking smile, it is very evident that we might with advantage attempt to copy them in the matter of solidity. Nobody can say that their walls were too thin or that the materials they used were defective. Mortar without lime is a novelty of the comparatively modern builder. It seems very ridiculous when we still have standing abbeys, cathedrals, and village churches built hundreds of years ago, that a clergyman should have to declare to his congregation that he was obliged to authorise immediate repairs to be made to his church in order to save the fabric—when it has only been standing twenty-eight years. Yet such is unfortunately the fact in the case of the church of St. Mary at Beswick, near Manchester. The early builders insisted on the stability of their erections. Would that their more modern brethren were equally emphatic, and then it would not be necessary to record that a church built in 1871 needed a thorough overhauling in 1899. With the jerry-built villa and the jerry-built cottage we have long been unhappily familiar, but it is with something of a shock that one learns that our modern builders of the baser part are applying their shoddy methods to the building of churches, where—if anywhere—honest workmanship might reasonably be expected.

The L.C.C. and Old Buildings.

TIME rushing along at a prodigious pace, with an army of councillors and builders at his heels proclaiming the requirements of a new population. Such is the picture—and the result is that one after another some historic house or landmark comes under the auctioneer's hammer, and is added to the long list of those set down for destruction. In no other place is this so evident as in London. "At Southwark in the Tabard as I lay . . ." sings good Geoffrey Chaucer, but where is now the Tabard? Staple Inn we still have with us, but the "Old Bell" in Holborn, taverns in Fleet Street closely associated with noted men of letters, numerous famous old houses in the suburbs—these are no more. Some time ago the London County Council devoted considerable attention to the question of preserving historic properties, and, through the powers they have since acquired, it is a pleasure to know that when future public improvements have to be made artistic and architectural considerations will not be altogether overlooked. The Council have just made another move forward in the right direction, for they have established, as a permanency, a photographic department, whose duty it will be to see that, when it is inevitable that interesting buildings shall be pulled down, pictorial records are, in all cases, made. Photographs are also to be taken when the alignment of a street is altered. We are glad that such an innovation has been made, as not only will the record thus obtained be of archæological and historic value, but it will doubtless be put to practical use when those occasional disputes occur affecting boundaries or the precise position of dismantled buildings. France and other European countries have for some time past nominated an official with authority in relation to these matters, and it is gratifying to see that the London County Council are attempting to see things from an æsthetic standpoint, and are following in the steps of our less practical foreign friends. The chief benefit will be reaped by the next generation, for, unlike us, they will be furnished with accurate representations of those structures which, though perhaps familiar to them by written descriptions, would otherwise belong to the vague and distant past.

VIEW LOOKING OVER STONE. DRAWN BY C. G. HARPER.

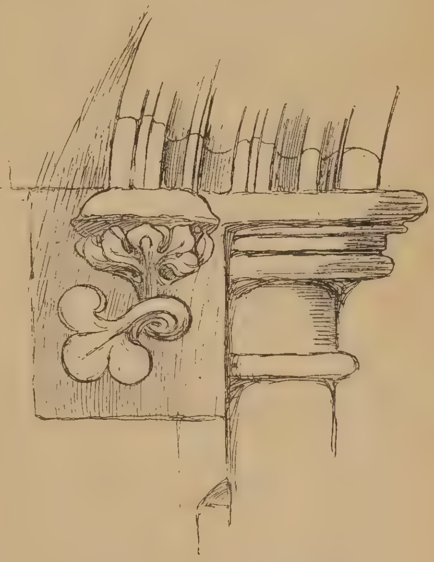
STONE CHURCH, KENT.

By CHARLES G. HARPER.

STONE CHURCH, one of the most beautiful and interesting in Kent, stands on a hill top a short distance from the left-hand side of the old Dover road, in the immediate neighbourhood of Greenhithe, and commands a wide view of the Thames. To architects and lovers of architecture it is remarkable on account of the striking similarity its rich details bear to those of Westminster Abbey, and it is generally considered that the architect of the one designed the other. This is the more remarkable since the Abbey, with this exception of Stone Church, stands alone in England as a beautiful and peculiarly personal example of Gothic thirteenth century architecture as practised in France. The architect of Westminster Abbey must have been of French nationality, and so curiously similar, in little, are not only the details of both church and abbey, but also the varieties of stone of which they are built, that they are most unlikely to have been the work of different men. Records, too, prove both to have been in course of building at the same time, towards the end of the thirteenth century, when the style known as Early English had reached its full development and was about to merge into the Decorated phase of pointed architecture.

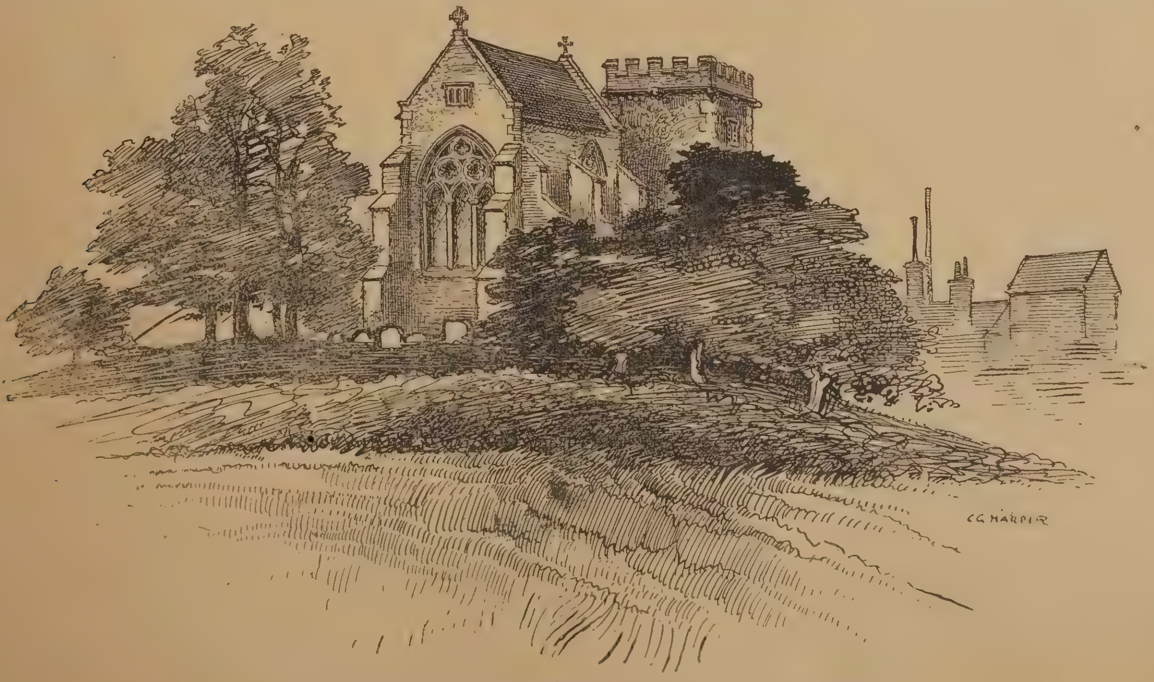
The style we call Early English was also in vogue in France, with this difference—that the French cathedrals and churches were characterised by a greater height in proportion to breadth than our own, a variation of treatment which sometimes gives to French work the appearance of an inordinate slimness and a corresponding look of insecurity. The pitch of French roofs, too, followed the loftiness of their design and was extremely acute. All these unfailing marks of nationality are seen at Westminster, and they are repeated, *in petto*, of course, at Stone, in those portions that have remained unaltered since the building was erected, *circa* 1250-80.

Stone Church consists now of chancel, nave, north and south aisles, western embattled tower of an extraordinarily massive character, and a vestry north of the chancel. Of these portions, the vestry is an addition of a century later; the tower has been altered as to details and the character of its piers changed; and certain windows of Decorated character inserted in place of the original developed lancets. The chancel has an arcade running round its three sides, and a chancel arch of great beauty divides it from the nave. On arch and arcades alike is a great deal of that beautiful conventionalised foliage, which is everywhere one of the greatest glories of Early Pointed architecture, and here it is seen in its full beauty, both of development of design and in artistic execution. A few years later than the date at which this work was done, architectural foliage decayed, in the ill-advised attempts that were made to directly imitate Nature in stone without the proper restrictions of conventional design. After the enrichments of the interior, the most remarkable feature of the church is the north door, a work whose beauty is only surpassed in this part of England by the chapter-house doorway at Rochester; and that, it must be borne in mind, was never intended to bear the rude assaults of all weathers, while this is in direct exposure to the elements, and has suffered accordingly. But it seems probable that this doorway at Stone had at least the protection afforded by a wooden porch, although nothing now actually remains to show that this was the case.



LABEL STOP, STONE CHURCH.

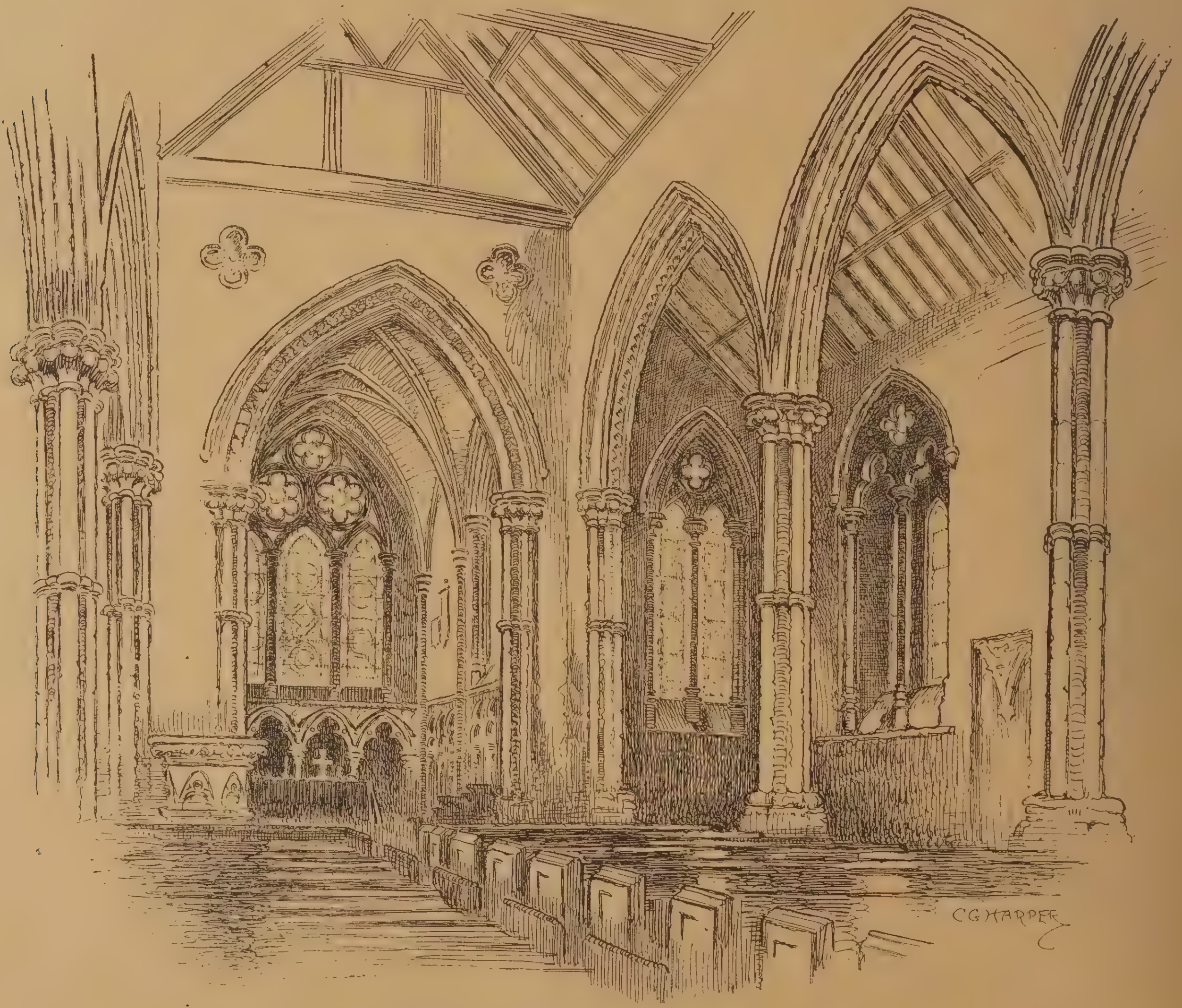
In this interesting corner of England it is curious and instructive to notice with what an artistic appreciation the old architects selected the best work of their predecessors for imitation, adding to it their own designs. At Canterbury this is particularly noticeable in the choir, where the Early English architect (his nationality was Norman, for he was William of Sens) employed alternately the round Norman arch and the pointed one of the newly-born first Gothic style; and where he grafted Early English details upon Norman outlines. Here their eclecticism, which is



STONE CHURCH FROM NORTH-EAST. DRAWN BY C. G. HARPER.

seen so rarely in other parts of England, is shown in the mouldings and decorations of this north doorway, where the Norman chevron is used in conjunction with ornaments peculiar to thirteenth century work. The drawing of this beautiful doorway is purposely copied from Cresy's work of some fifty years ago, in order to show these details, for of late years, unhappily, nearly all the carving has perished.

The history of Stone Church is equally interesting with a study of its architectural style, for it was built with the aid of offerings made at the shrine of Saint William of Perth at Rochester, and was evidently begun on a more elaborate scale than the resources of Rochester could afford to bring to a logical conclusion. This may be observed, first, from the exterior, where the chancel is noticeably higher than the body of the building, and, secondly, from within, where the chancel roof is seen to be vaulted and groined in a manner more like that of a conventual church on a small scale than that of a building devoted merely to parochial use.



INTERIOR OF STONE CHURCH. DRAWN BY C. G. HARPER.

In fact, the whole style of Stone Church decreases in ornateness as it proceeds westwards. The groined and vaulted chancel, more lofty than any other portion, gives place to a nave, beautiful indeed, with its light arcades and chaste proportion, but roofed in timber instead of stone.

This gradual declination may be noted also in the difference between the easternmost arches of the nave arcade and the others, the first being elaborately ornamented with dogtooth moulding, while the mouldings of the rest are plain. The same applies to the windows; one only of those lighting the nave —the easternmost one in the south aisle wall —being provided with external plate tracery and with an internal replica of it, supported on a slender shaft, as indicated in the accompanying drawing of the interior of the church.

The design ends with an unfinished, though massive and stately, tower. Indeed, its very strength, unnecessarily great if this were all that was intended, alone goes to prove that the original design included another stage, and possibly a tower, which all this wealth of stone and buttress was built up to support. Restoration, in 1860, has taken away some of the interest, but the work was in good hands, those of the late Mr. G. E. Street. Some hideous modern glass lessens the beauty of the chancel, and should be removed. There are brasses in the church, of which the most interesting is that to John Lumbarde, rector, who died in 1408. His figure is encircled with the Credo.

These notes would be incomplete without further reference to Street's restoration of nearly forty years ago. Cresy's monograph on Stone Church is worth referring to, in order to compare the building as it is now with the appearance it presented then. Except for this archæological interest, Cresy is utterly useless and out of date. He has, for instance, a view of the chancel as it was before Street's restoration restored the vaulting. That view shows the flat plaster ceiling which had been there since the reparation of the church after the fire caused by lightning in 1638; and also shows the Perpendicular east window which Street removed and replaced with one of his own, designed exactly to match the original ones of the same character as this in the north and south walls of the chancel. It is essential for anyone writing at length on Stone Church for technical readers to have recourse to Street's own account of Stone and his work there. This may be found in "Archæologia Cantiana," Vol. 3, 1860. He gives a view of the exterior, with the addition of a shingled spire which he proposed, but which—happily, as I think—has not been carried out. The restoration was not, for lack of funds, carried to its logical conclusion, and forty years of neglect have since then wrought much havoc, the church being unhappily situated in a poor district and immediately adjoining a railway and a great number of lime and cement works.

THE CATHEDRALS OF GLOUCESTER AND BRISTOL.

By W. LEE CLARKE.

GLOUCESTER has always been a town of importance owing to its position on the banks of the Severn. It is one of the most interesting and historic of our cathedral towns. Its chief and most important building is the cathedral, once the Abbey Church of St. Peter. It stands a little distance back from one of the main thoroughfares of the town, and is, to a considerable extent, surrounded by houses. The close is by no means extensive, but many pretty peeps of the building are obtained from the green. To get a really good view of the cathedral one should climb to the tower of St. John's Church, from which the building is seen to best advantage. Nearly the whole of it dates from Norman and Perpendicular periods: in fact, the plan has undergone but little alteration since Norman times. Gloucester Cathedral abounds in individual features, one of the most interesting being the Lady Chapel. This is an independent building, and not a continuation of the cathedral. It is long and narrow, without aisles. On each side is a two-storeyed chapel, each containing some exquisite fan-tracery vaulting. Nearly all the wall space seems taken up by windows. This beautiful chapel was built between the years 1457 and 1499.

The east window of the choir is the largest painted window in England. The manner in which the exterior mouldings of this window (and also of the west window) are carried upwards so as to form a sort of gable is worthy of note. Another individual feature is the exquisite fan-vaulted cloister walk. It is certainly no exaggeration to say that these cloisters are the finest in England. They form a quadrangle, but are protected from the weather by rows of glazed windows. There are ten bays on each walk, with a window in each bay. In the north walk is the monks' lavatory, which takes up four bays. It is a well preserved piece of work. The most noteworthy feature of these cloisters is the fine fan-vaulted ceiling, it being the earliest example of this particular vaulting. As a rule, the cloisters are situated on the south side of a cathedral or abbey, but here they are on the north side of the building. Of all the external beauties, the tower is decidedly the most striking. It forms an admirable centre to the mass surrounding it. In general scheme it is not unlike Canterbury. Rising as it does at the intersection of the transepts with nave and choir, it is the chief feature of the massive pile. Its graceful traceried pinnacles and pierced parapets give it a peculiar charm. It is 225ft. high to the top of the pinnacles, and dates between 1450 and 1457.

The peal of bells are especially interesting from the fact of their age, and also because they escaped the clutches of the church wreckers at the time of the Dissolution. The cathedral suffered but little during the historic siege of Gloucester, but we are told that during the Commonwealth its destruction was intended and the wrecking of the little cloisters and Lady Chapel had been commenced, and had it not been for the exertions of the Town Clerk, the tower would certainly have perished, as all the necessary apparatus for its overthrow was in readiness.

Bristol has been rightly called "the City of Churches." Many of them are very ancient, some dating from the Norman Period, whilst one, St. Mary Redcliffe, is said to be one of the finest parish churches in England. Although the cathedral does not rank among our large English cathedrals, it is somewhat interesting in detail, and picturesque in appearance. The original building was the Church of the Monastery of St. Augustine, founded by Robert Fitzhardinge in 1142. Some parts of the old Norman building still remain.

The position of the cathedral is certainly not a good one. There is no close worth speaking of, it flanks the street on the north side, and there is a burial ground on the south; on the east is a narrow lane with houses overlooking the burial ground. There is a small grass plot at the west end, but no comprehensive view is obtained from it. Of the old church, the choir and transepts alone remain, the nave being added in 1877 by Street.

The aisles are equal in height to the nave and choir, there being no triforium or clerestory. The nave contains six bays, and is 120ft. long, 69ft. broad, and 60ft. high to the stone vaulted roof. The Elder Lady Chapel contains some good Early English work, and dates from 1196 to 1215. The east window dates from 1320, and is filled with some of the very best glass in England. It was cleaned and restored in 1847.

The Chapter House is of Norman design, and forms a parallelogram 42ft. by 25ft. It is preceded by a vestibule of Norman arches, round and pointed. The walls of the room are lined with circular arcades with intersecting arches, all of which are enriched with carving. The central tower is of Perpendicular work, and was practically rebuilt in 1894.

Adjoining the cloister (the north and west walks of which alone remain) are portions of the Bishop's Palace, which was destroyed by fire during the riots of 1831.

The Norman archway, a little to the west of the cathedral, was originally the approach to the abbot's lodgings, the superstructure being of modern times. Viewed from a distance, as illustrated by the sketch, the massive pile has a picturesque though by no means a graceful appearance. About £16,000 has been spent during the past seven years in restoring the cathedral.

DISPUTED POINTS UNDER THE LONDON BUILDING ACT.

By GEORGE H. BLAGROVE,

Certificated Surveyor under the Act; Author of "Dangerous Structures," "Shoring and its Application," &c.

(Continued from page 102, No. CCXLI.)

III.—PROJECTIONS.

PROJECTIONS from buildings are regulated under Section 73, which applies to all buildings, wherever situated, except when the contrary is expressly stated. A shop front may project in a "street or way," and a bay window, oriel window, or turret may project in a "street," while there are sundry restrictions as to projections over the "public way." In most cases there is no doubt as to whether a locality is a "street" or "way," or as to where the "public way" begins and ends. Occasionally, however, there is room for uncertainty, and it is clearly undesirable to form projections which may have to be removed because they cannot be sanctioned.

What is a Street?

The question, what is a street? was raised in the case of *Wood* v. *London County Council*, in which the decision of a magistrate was reversed on appeal. In this case a quadrangle, open to the sky, was intended to be enclosed with buildings on every side, and to be approached through a single archway, which would be closed by iron gates. The buildings were to contain forty-two flats, which were to be approached from two entrances and staircases leading from the quadrangle. The archway and quadrangle were stated to be for the use of the tenants in the flats "and the tradesmen and others visiting them on business and pleasure, with or without carriages." Now the definition of "street" under Section 5 (1) includes "any highway, and any road, bridge, lane, mews, footway, square, court, alley, passage, whether a thoroughfare or not, and a part of any such highway, road, bridge, lane, mews, footway, square, court, alley, or passage." The magistrate held that the quadrangle was a street within the meaning of this definition, and he convicted the appellant of having commenced to lay it out for carriage traffic without the sanction of the Council, contrary to Section 7. The Court held that the magistrate was wrong, and that the quadrangle was not a "street."

It appears that in all similar enclosures the provisions of Section 73 do not apply. A case came under my notice in which several blocks of buildings were grouped around a similar open space, which was only approachable through gateways, closed at night. Here the district surveyor allowed the main cornice to project more than 2ft. 6in. over what would have been the public way had the enclosure been a "street."

Projections Requiring the Consent of the Council.

The powers conferred upon the Council in respect of buildings or structures beyond the general line, are, under Section 171, applicable also to the local authority; and Section 73 (8) provides that the Council are to consult with the local authority before giving their consent to any projection beyond the general line, when such consent is required. Nevertheless, the sanction of a local authority is not sufficient in cases where the consent of the Council is required. This was proved when the proprietors of a public house at Hackney were summoned at the instance of the Council for causing the erection of a building beyond the general line. The defendants had a convenience at the rear of their premises, which was objected to by the licensing justices because it was approached through a club-room. The justices selected a spot in the back yard for the erection of a new convenience, which was approved by the vestry, and built accordingly. But as this new structure projected beyond the frontage line of an adjoining thoroughfare, the Council took proceedings, with the result that the defendants were convicted of an offence against the Act.

What is a Projection?

It is evident that some portions of a building may project without being "projections" within the meaning of the Act. Section 73, after defining the projections that are permissible, excludes all others, excepting "water pipes and their appurtenances, copings, string-courses, cornices, facias, window dressings, and other like architectural decorations." A porch or portico is a projection requiring the consent of the Council. But a doorway may have pilasters or engaged columns, supporting an entablature and a pediment; these would be architectural decorations. The columns, instead of being engaged, might be detached, thus projecting a little more; and it becomes difficult to see where the doorway ends and the porch begins. I have known some surveyors assign the limit of 18 inches for architectural decorations; but this seems quite arbitrary. I should be disposed to define an architectural decoration as something which can be either corbelled out or supported upon a set-off; if it requires a foundation, with footings, &c., it ought to rank as a projection. A safe rule in such cases would be—"when in doubt apply to the Council."

Bays, Oriels, and Turrets.

In Section 73—(5) and (6)—it is provided that bay windows, oriel windows, and turrets may be erected, subject to certain rules, in a street not less than 40ft. wide, or "to a building, the front wall of which is not at a less distance than 40ft. from the opposite boundary of the street." It is not expressly stated, but is evidently implied, that the projections specified are intended to be erected in advance of the front walls of buildings in a street; and no rules are furnished as to projections from rear walls or flank walls not facing any street. In (5) (*g*) and (6) (*e*) we read that bay windows, oriel windows, and turrets, "to which the foregoing rules do not apply," shall not be erected without the consent of the Council, after consulting the local authority. Here the language is certainly ambiguous. Had this exception been stated with respect to projections "which do not conform to the foregoing rules," there had been no room for doubt as to the meaning. As it is, the phrase "to which the foregoing rules do not apply" admits of a somewhat wide application. The rules do not apply to projections in the rear. Is it intended that these shall not be erected without the consent of the Council? I have never known such a view adopted by any district surveyor; on the contrary, I have known of bay windows erected in the rear exceeding in dimensions the limits defined under Section 73.

What is a Bay Window?

To understand what a bay window really is we must refer to Section 73 (5), where we read that bay windows to dwelling-houses may be erected "on land belonging to the owner of a building." This clearly implies that every bay window must have a foundation upon the solid earth. I knew a case in which it was proposed to build a bay window, corbelled out like an oriel, in the ground storey only of a dwelling-house, there being a basement and forecourt below. This could not have been allowed under the rules for oriels, no part of which may be less than 10ft. above the level of the street (6) (*b*); and the district surveyor treated the projection as a bay window, and required it to be supported upon columns with proper foundations.

No rules are prescribed for the construction of bay windows, and they are usually built with walls whose thicknesses are determined by Part I. of the First Schedule. This may perhaps be justified under Section 1 of the Preliminary part of the Schedule: "Every building, unless otherwise sanctioned in accordance with this Act, shall be enclosed with walls constructed of brick, stone, or other hard and incombustible substances." I have heard it contended that the walls of a bay window cannot be regarded as external walls within the meaning of the Act, because they are obviously not intended to be regulated by Section 54 (1) (*b*), which limits the proportional area of openings in external walls. As a matter of fact, they are generally built so as to be out of conformity with the last-quoted section. It is to be wished that the Act had been more explicit as to the construction of bay windows, or that there were some authoritative decision upon the question.

Oriel Windows and their Construction.

It may be observed that, under Section 73 (5) (*b*), bay windows are permissible provided that they "do not project more than three feet from the main wall of the building to which they are attached." The presumption is that bay windows may have cornices and stringcourses projecting beyond the limit of 3ft. But in the case of oriel windows the phraseology of the Act is different. These are permissible provided that (6) (*a*) "No part of any such projection extend more than three feet from the face of the front wall of the building." Here the words, "No part of any such projection," may be taken to mean that cornices and stringcourses must be kept within the limit of 3ft. There would thus be a fundamental distinction, as regards the amount of projection, between bays and oriels, because the former rest upon foundations and the latter are corbelled out. But I am aware that the opinions of surveyors are not unanimous upon this point.

There is nothing in sub-section 6 to regulate the construction of oriel windows. On the contrary, it is expressly provided that (*e*) "every such projection be constructed to the satisfaction of the district surveyor, or, in the event of disagreement, to the satisfaction of the superintending architect, whose determination shall be final." A case came under my notice in which an architect designed an oriel window of wood, hoping that its construction would be "to the satisfaction of the district surveyor." The district surveyor, however, objected to it, not on the ground that it was not to his satisfaction, but that he had no power to sanction it; and he based his contention upon Section 55, which provides in effect that no woodwork (except shop fronts) may project beyond the external face of a wall. An application was then made to the Council, who sanctioned the construction of the oriel on condition that it was of "oak, teak, or other hard wood." This was in accordance with the last paragraph of Section 55, which provides that the Council may, "by bye-laws or otherwise," exempt from the provisions of the section oak, teak, or other wood, "provided the work be constructed to the satisfaction of the district surveyor."

The conclusion to be drawn from this case is that the district surveyor was right in his contention, otherwise the Council would have held that the application was unnecessary, and would have refused to entertain it. It is evident, also, that the stonework or brickwork of an oriel must be an external wall within the meaning of the Act, otherwise the oriel could not contain any woodwork beyond the external face of the main building.

Trade Signs.

With the exception of Part XII., relating to sky signs, there appears to be no provision in the Act expressly dealing with trade signs as such. Much ingenuity is expended in devising new sorts of signs, and some of these, when permanently fixed to the walls of buildings and projecting over the public way, would appear to come within Section 73. There is, for example, an illuminated sign, semi-elliptical upon plan, frequently fixed so as to project over the entrance of a public house. Architects, as a rule, are accustomed to regard such signs as rather detrimental than otherwise to architectural effect, and some of them would possibly not be sorry if the erection of some trade signs were prohibited. But such matters are of vital importance to tradesmen, and it is to be wished that some definite regulations were laid down in regard to them.

(To be continued.)

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

BACK NUMBERS OF THE BUILDERS' JOURNAL.

In reply to NEW SUBSCRIBER (Hamilton, N.B.), the present volume began with number CCXXXV., dated August 2nd; back numbers of these can be had, price 1d. each.

W. B. (Croydon) can obtain the numbers for February 1st, 8th, 15th, and 22nd, and for March 1st, 15th and 22nd at this office, price 1d. each (post free 1½d.)

A BOOK ON PERSPECTIVE.

To the Editor of THE BUILDERS' JOURNAL.

KEIGHLEY.

SIR,—Will you please tell me through the medium of your valuable paper which is the best book to be got on architect's (direct method) perspective. Please let me know the name of publisher and price of the best book. Thanking you in anticipation of an early answer.—Yours, &c., F. L. S.

We advise you to get Mr. G. A. T. Middleton's book on "Linear Perspective," published by B. T. Batsford, of 94, High Holborn, London, W.C.; price 1s.

BOOKS ON DRAINAGE.

To the Editor of THE BUILDERS' JOURNAL.

ISLE OF MAN.

SIR,—Will you kindly give me the names and publishers of works by reliable authorities dealing with the drainage of small towns and villages built in an uneven and hilly country, and oblige, yours truly, NEMO.

The following books are recommended:—"Drainage of Lands, Towns, and Buildings," by G. D. Dempsey, C.E., with additions on "Recent Practice in Drainage Engineering," by D. Kinnear Clark, M.I.C.E. (post free 3s. 9d. nett); "Sanitary Work in the Smaller Towns and in Villages," by Charles Slagg, Assoc. M.I.C.E. (post free 2s. 6d. nett); "Sanitary Engineering," by Colonel E. C. S. Moore, R.E, M.S.I. (30s. nett), all obtainable from B. T. Batsford, 94, High Holborn, W.C.

"RICKMAN'S GOTHIC ARCHITECTURE."

To the Editor of THE BUILDERS' JOURNAL.

LONDONDERRY.

SIR,—Can you tell me whether "Rickman's Gothic Architecture" is now only to be obtained on secondhand bookstalls, and by similar chance, or can I obtain it through a publisher? I have already made inquiries locally, but have not been able to obtain information.—Yours truly, H. E.

"Rickman's Gothic Architecture" is out of print, and is scarce. The best edition would cost about 22s. Mr. Bloxam's book on the "Principles of Gothic Ecclesiastical Architecture" (two vols., post free, 12s.) would be the best substitute. "English Church Architecture," by George Gilbert Scott, F.S.A., should be useful to you. Its price is 26s. Both works are published by B. T. Batsford, 94, High Holborn, W.C.

BOOKS FOR STUDENTS OF ARCHITECTURE.

To the Editor of THE BUILDERS' JOURNAL.

DEAR SIR,—Would you kindly advise me as to what books would be most serviceable to me in preparing myself for the examination in architecture (South Kensington)?—Yours truly, J. B.

We would suggest Hamlin's "History of Architecture," Spiers' "Orders," Glazier's "Historic Ornament," Parker's "Glossary of Architectural Terms" (small edition), and Anderson's "Italian Renaissance," combined with ample study, preferably by making measured drawings in pencil on the spot, of English Gothic work. All these can be obtained from B. T. Batsford, 94, High Holborn, W.C., possibly secondhand in some cases.

G. A. T. M.

ANCIENT LIGHTS.

To the Editor of THE BUILDERS' JOURNAL.

HYTHE, KENT.

SIR,—I shall be glad to receive an answer to the following questions: I am about to secure a piece of ground which has one window overlooking it, which has been built about six years. Shall I have to allow the owner of this building ancient lights, or shall I have to allow him in any way for the same? I should also like to know how long a house has to be built to claim ancient lights?—Yours, &c. H. O.

Six years does not constitute a right of light. The term to obtain a right of light is twenty years, provided no obstruction has taken place for one year after the party interrupted shall have had, or shall have, notice thereof. It follows that if uninterrupted light has been had for nineteen years and one day, the right of light is obtained, seeing that a twelvemonths interruption cannot be made in the remaining time to complete the twenty years. This right of light can, however, be foregone by consent or agreement expressly made, and it is the wisest course to pursue to try and obtain such an agreement, which will avoid the expense of erecting a hoarding to keep out the light. The adjoining party will probably not mind doing this, for it would not avail him anything to oppose; the only pleasure he might get being to cause extra expense.

TENANT'S LIABILITY FOR DILAPIDATIONS.

To the Editor of THE BUILDERS' JOURNAL.

EAST TWICKENHAM.

DEAR SIR,—I should be very much obliged if you would tell me through the columns of your valuable paper the proper methods to pursue with regard to the service of a schedule of dilapidations on an outgoing tenant. Also the form such schedule should take, and whether any clause should be inserted relative to referring the matter to arbitration.—Yours faithfully, SURVEYOR.

The lease on which the premises are held should be carefully read. Probably it contains a clause permitting entry for the purpose of measurement. The schedule should then be prepared much in the form of a bill of quantities, only instead of division being by trades it should be by rooms, only such items being inserted as are clearly dilapidations according to the lease, fair wear and tear being always excepted, and particular attention being paid to such small matters as lost keys and broken sash fasteners. No mention should be made of arbitration unless the bill be objected to by the tenant, in which case he should be asked to appoint a surveyor to go into the bill, the two surveyors meeting and signing a fair award, or referring the matters in dispute to a third surveyor. It would be well to read Stevenson's book on the "Measurement of Dilapidations" (Batsford).

G. A. T. M.

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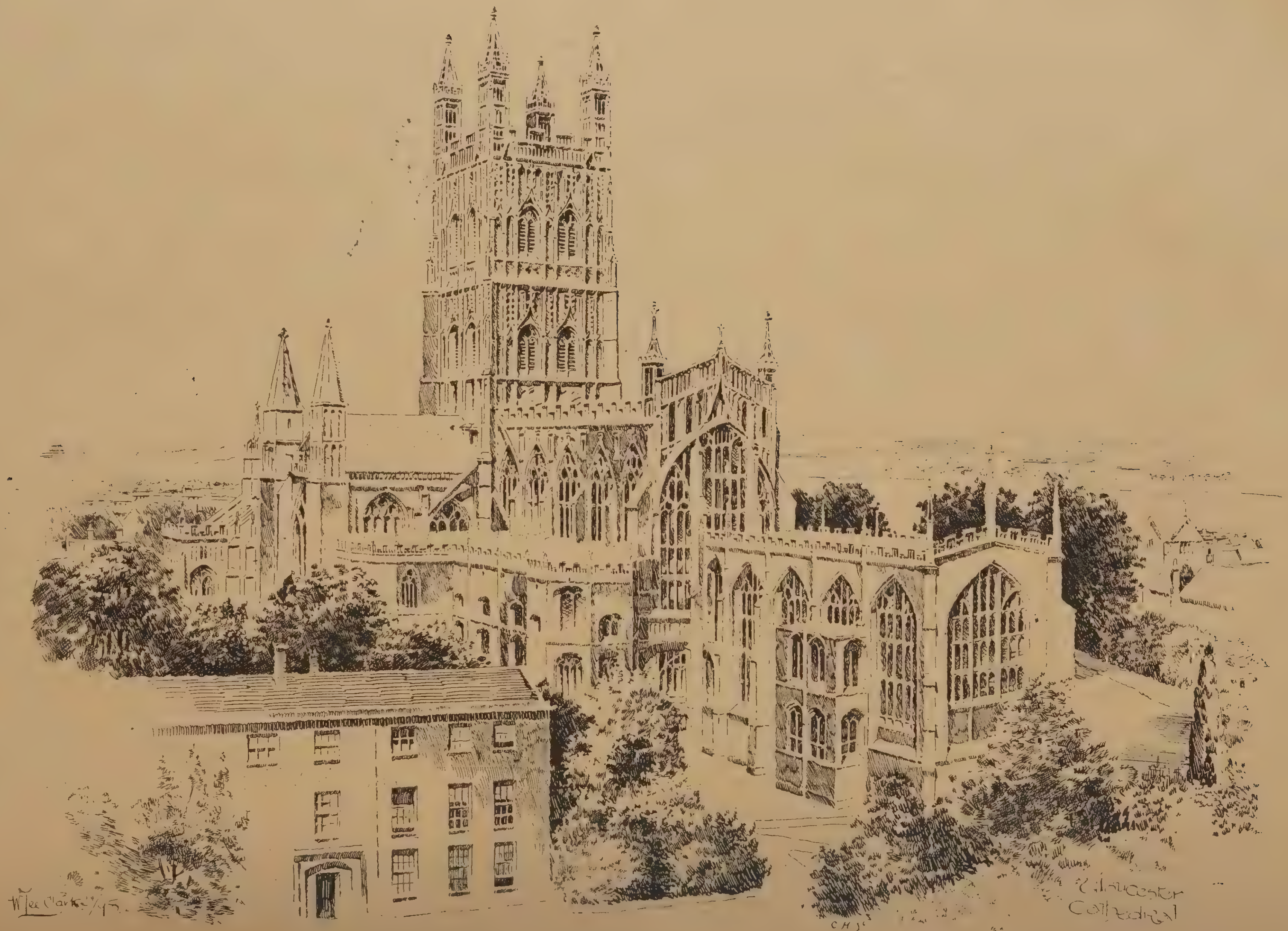

GLOUCESTER CATHEDRAL. DRAWN BY W. LEE CLARKE.

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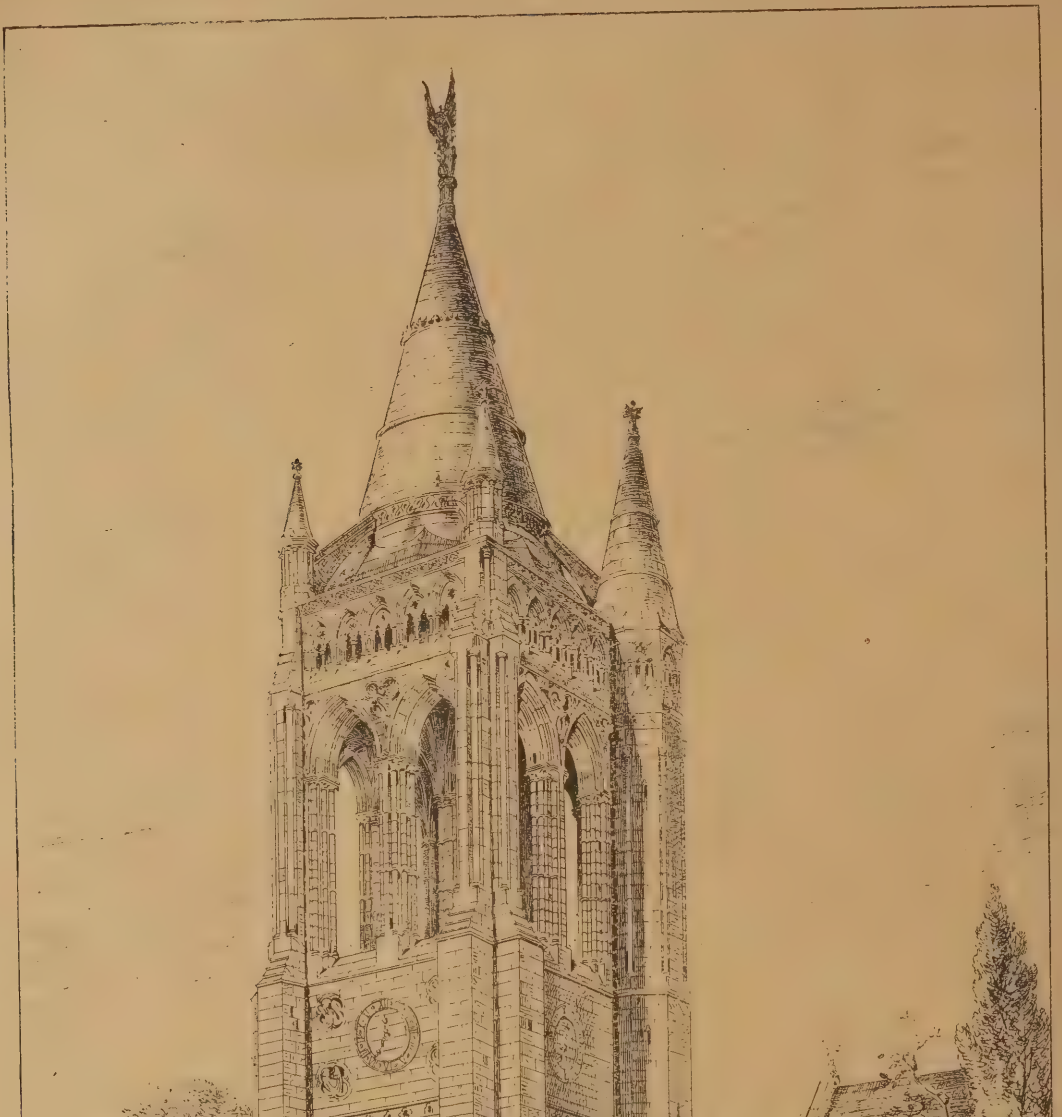
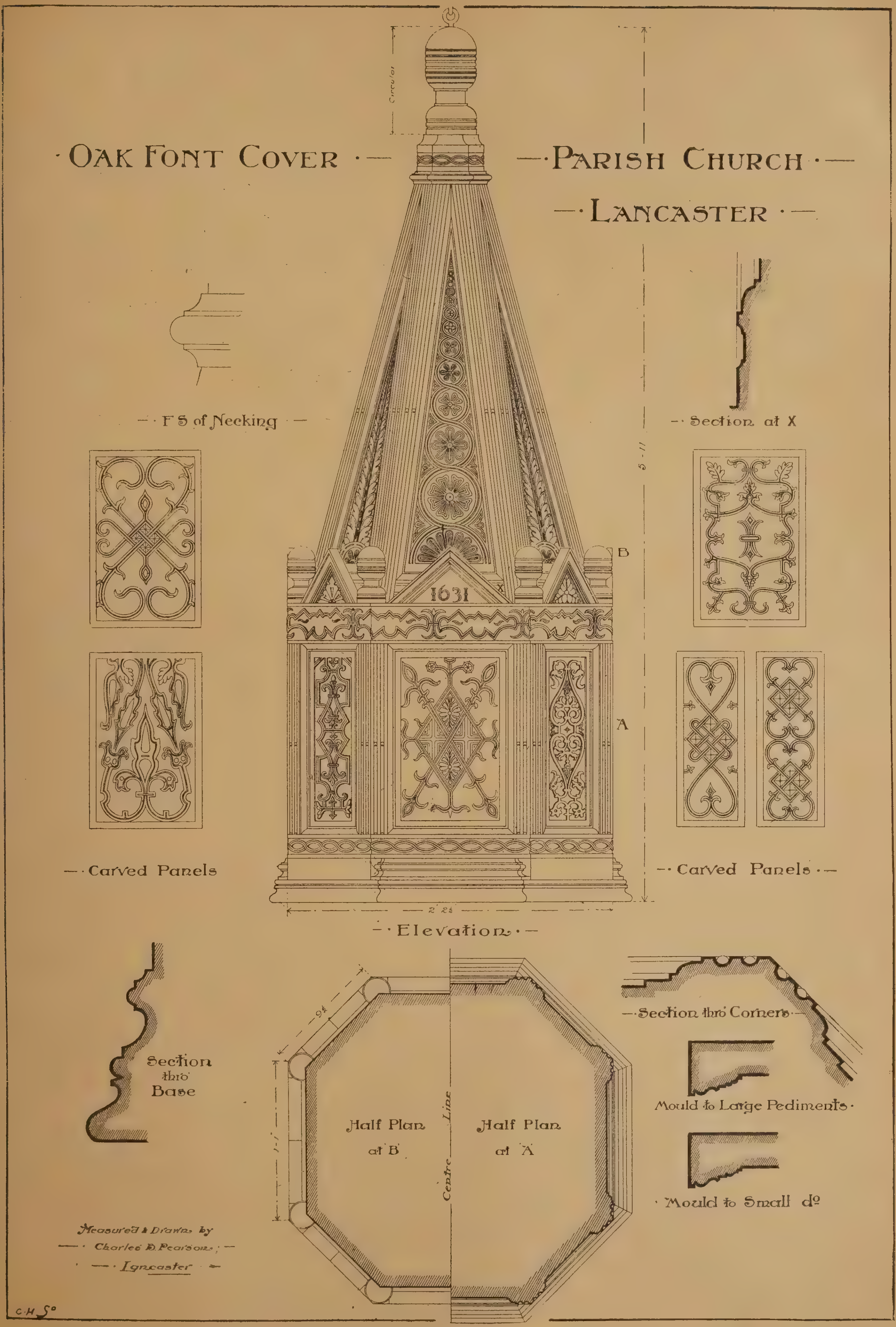

PERCY G STONE 99
✝ A DESIGN for the TOWER of ST MICHAEL'S CHURCH ✝ BOURNEMOUTH ✝

Percy G. Stone, Architect



DRAWN BY CHARLES B. PEARSON.

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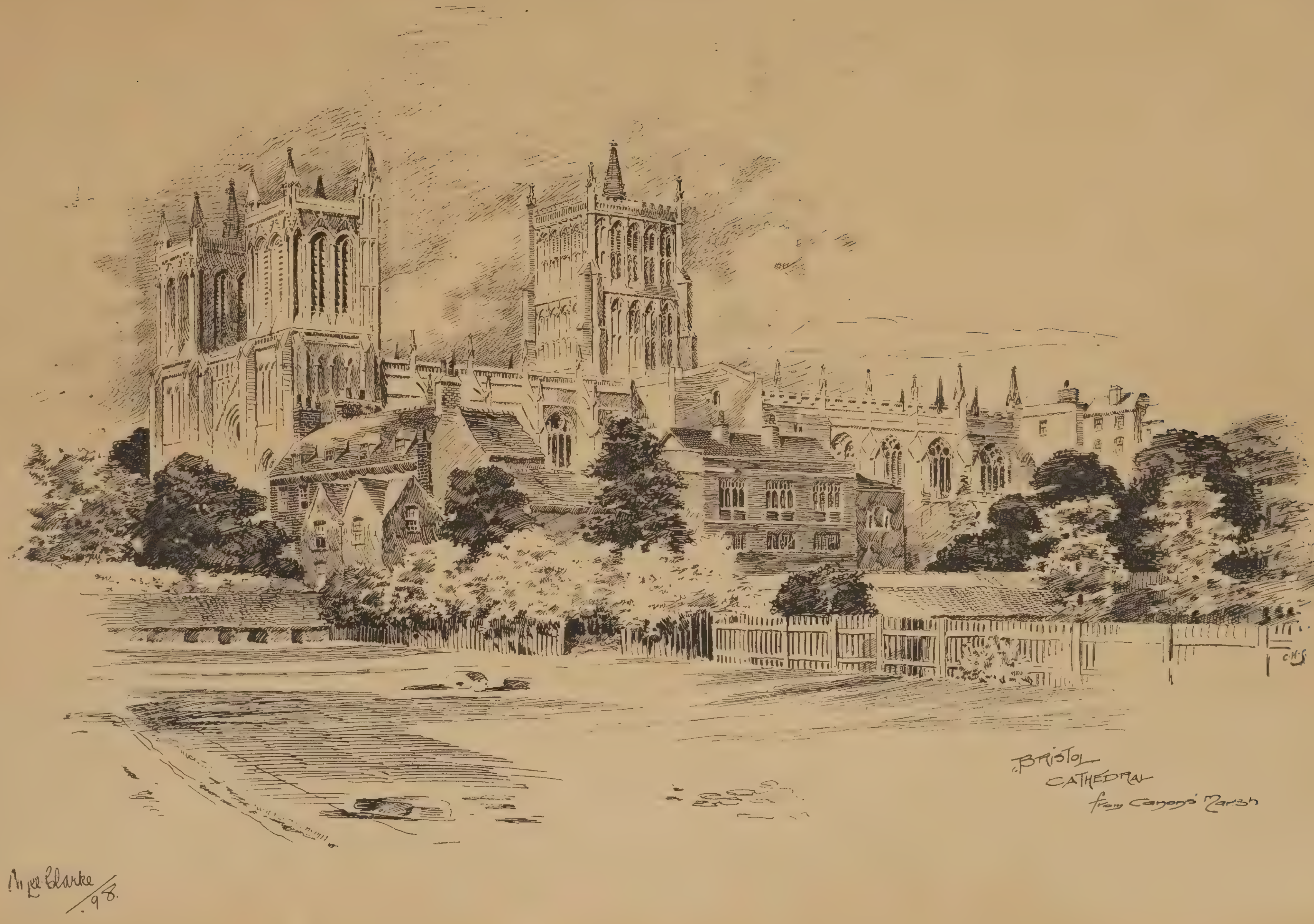

BRISTOL CATHEDRAL, FROM CANONS' MARSH. DRAWN BY W. LEE CLARKE.

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Correspondence.

A QUESTION OF CULT.

In our issue for September 20th, on page 108, appears a perspective view and plan of some houses to be erected at Claygate in Surrey. In reference to these illustrations we have received some interesting and somewhat amusing correspondence. We are always pleased to publish good humoured criticism on matter appearing in our columns, especially when—as in the present instance—the subject is one of general interest to the architectural profession. The author of the drawing is invited to reply, and we shall be glad to have the opinions of other readers on the subject. The following trenchant letter by a well known architect seems to show that the cult of Aubrey Beardsley does not altogether commend itself to architectural draughtsmen :—

A Bolt from the Blue.

To the Editor of The Builders' Journal.

London, S.E.

Sir,—Your interesting paper is delivered to me, with other weekly publications, usually upon a Saturday. That arrangement enables one to give more time to study its contents. In doing so this week I was much amused by one of the illustrations in your issue of Sept. 20. It is supposed to represent some houses at Claygate, Surrey, and seldom have I ever enjoyed so good a laugh as that evoked by this illustration.

Apart from the "design" of the houses, which—well, one can hardly call a "striking" one, did ever any human being, much less an artist, ever see such surroundings? Examine the clouds, they are evidently modelled from that palatable vegetable the kidney bean, and if kidney beans could be grown in proportion to the size of the houses, the producer of these in this picture would soon make a fortune.

I should imagine that the "producer" of this view (I think this is the best term to use for him) must be a vegetarian, for look at his fearful and wonderful trees, they are evidently drawn from some illustration of a cocoa pod just bursting with seed, while gigantic crocus lie prostrate in the road, and the poor sheep are trying to make a meal off the bare stones, thus evincing the "producer's" hatred of mutton.

The little toy windmill, in the view, on the top of a mountain, and the little house on the right-hand side of it, whose eaves are built at the same angle as the mountain side, is "so like Surrey, you know." And as to the sign-post in the left-hand front of the view—well, there is a good deal of "post" in it, but, puzzle, "find the sign."

To finish this masterpiece, look at the stout lady dressed in the costume of the period of the late George Morland, who, by the bye, only painted coarse women and coarse pigs. This lady should not, evidently, be entrusted with the care of an infant (as shown), for she would certainly come to grief if she advanced a step further into that pond of water lilies to which she appears to be rushing to her fate; she is apparently making a "bolt from the blue" of the kidney bean sky.

Surely, if to be eccentric is to be famous, hen the "producer" of this view has sueeded in obtaining some sort of notoriety. I hould presume he belongs to some "cult" or ther; but, then, alas! great criminals are ften more notorious than great statesmen.

It is quite refreshing, after these wretched cult" productions—these Aubrey Beardsley anities—to look again at the splendid archiectural illustrations, many of them sunny ictures, that have been published from time time during the last thirty years from the ilful pencils of such men as A. H. Haig, Deshon, the gifted but unfortunate H. A. Fribble, and that prince of architectural delineators and clever artist, James Langham. If some of the present sickly "cultists" would study these men's work a little, it would, I am sure, do them good and brace them up a bit, even if it could not make them strong men. And again, if they want to see what trees and skies really should look like in pictures, let them study the grand works of Arran Penley's on water-colour painting.

I feel that some stand should be taken against such grossly perverse views of beautiful Nature, and this must be my apology for trespassing so much on your valuable space. H. T. B.

Nor is it only with respect to the drawing of the perspective that our readers have exercised their critical faculties upon this design. Here is a letter from a correspondent who finds the plan also open to grave objection :—

An Amended Plan.

To the Editor of The Builders' Journal.

Bishop's Stortford, Herts.

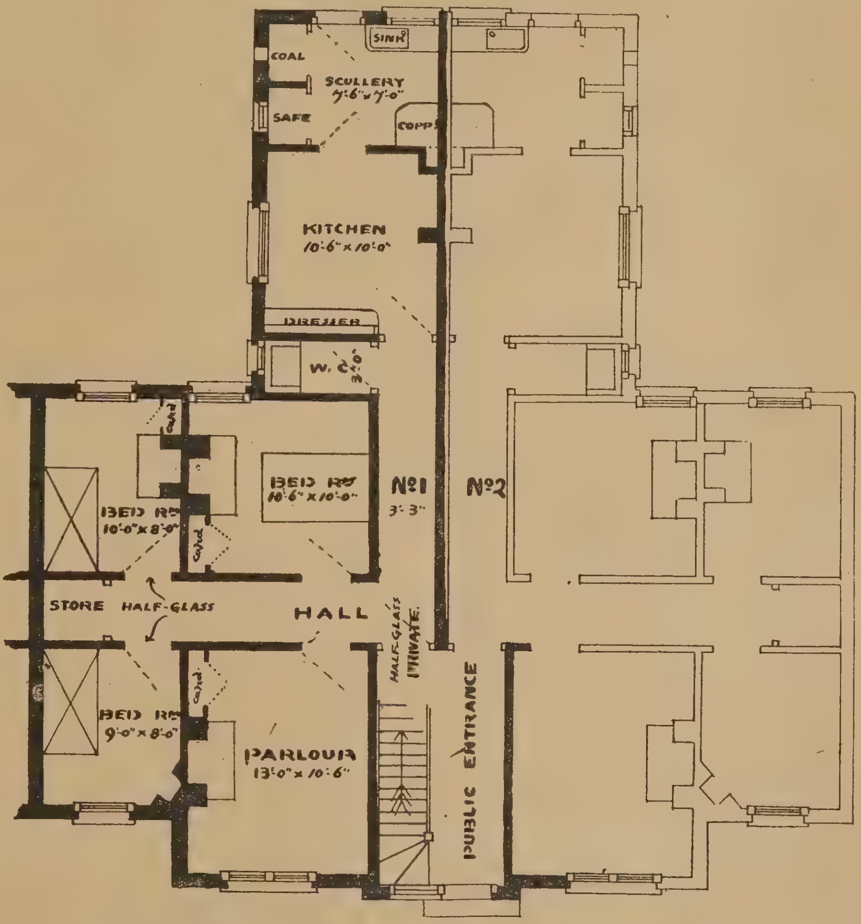
Sir,—I am afraid that the houses proposed to be erected at Claygate, in Surrey, as self-contained dwellings, will not be a commercial success.

Where will the twenty or more families be found to occupy them that are not hampered, say, with three or four children; are they to be crowded into the one bedroom, as shown on plan, page 108, No. CCXLI.? What would the medical officer of health say to this?

My experience of cottages and houses for the working class is that two bedrooms is not sufficient, and if three can be given, for the sake of decency let each be private.

I inclose you an amended plan of the one on page 108. By reducing the size of parlour and bedroom, and a slight increase in the frontage, a very convenient block is obtained, which, with the broken front, would give the elevation a much better effect.

ALFRED BRETT.



SUGGESTED PLAN FOR WORKMENS' COTTAGES. A. BRETT, ARCHITECT.

Another correspondent founds upon this drawing the following interesting reflections on the tendencies towards eccentricity manifested by present-day draughtsmen :—

Eccentric Architecture.

To the Editor of The Builders' Journal.

Brixton Hill, S.W.

Sir,—May I be permitted to call attention to the tendency among exponents of the modern school of architectural draughtsmanship to affect the "eccentric" in their productions? Some of the perspectives recently published in your journal show very plainly the extreme lengths to which such draughtsmen can proceed when their imaginations are given full play. Take, for instance, the latest method of drawing a shrub or bush as an architectural accessory. On examination it will be found to consist of very carefully drawn leaves and berries to a huge scale inclosed in a net or bag of some transparent material. If the gauze envelope be removed, we have remaining an admirable botanical study no doubt, but that such a feature is in any sense appropriate to an architectural perspective, few people, I imagine, would have the temerity to maintain. Similar absurdities, doubtless considered "original" and "clever" by those unthinking individuals who can always be relied on to worship the unintelligible, are to be detected in this class of drawing. Surely those to whom consistency in matters appertaining to art is of the first importance have a right to offer a protest against the introduction of these crude perversions.

The climax is reached, however, by the author of the houses at Claygate, a "perspective" of which appeared in your issue for September 20th. The subtle conception of sheep kicking the dust off their hind feet into little bags tied to their hoofs is of the highest order, and, apart from its value to rural surveyors as a suggestion for an economy in road cleansing, throws a new light on the intelligence of a hitherto neglected performing animal.

The same drawing shows us how a "clever" sky effect may be produced by trailing skeins of unravelled thread diagonally across the picture, and attaching to their ends a few inflated sacks. The result is positively realistic, and only needs the potato salesman's name stencilled here and there to be exactly what an up-to-date Arts and Crafts sky should be. Equally hideous and fantastic are the crops of rissoles sprouting up amidst the boulders with which stray patches of the road are paved. The drawing is full of such oddities, and one is tempted to infer by their presence that the author of the design was a little afraid of the reception which might be accorded his simple and altogether satisfactory treatment of the elevations without such aids or "distractions."—Yours faithfully,

FREDERICK CHATTERTON, A.R.I.B.A.

GYPSUM.

To the Editor of The Builders' Journal.

Exeter.

Sir,—Under this heading, in No. CCXLI., page 103, "Student" asks: "Is gypsum used for any other purposes besides making plaster of Paris?" And this query has produced the very remarkable answer: "Gypsum is used by brewers in some districts to soften the water used for making beer. A coarse kind of gypsum is also used as a fertiliser in districts where the raw material is cheap." Gypsum, as everyone knows, is alabaster, and has been largely used in this country for the internal beautification of churches and large buildings ever since the time of the Norman Conquest, and probably long before. The old alabaster used within Westminster Abbey was quarried at Chellaston, near Derby, in the eleventh century, and I have had admirable blocks from the same place myself in recent times. The best comes from Derbyshire and Staffordshire. Blocks can be obtained of almost any size—certainly up to 26ft. long. Italian alabaster runs very much smaller—2ft. by 2ft. is a goodly size—and these foreign blocks are always misshapen, and hence wasteful in use. White Italian alabaster, however, is purer in its colour than is anything to be obtained in England. Most of our native alabaster is richly veined. The white variety is rare. The largest block of English white I ever had was just over 6ft., widest measurement. I have had blocks of grey alabaster from Luxemburg, Germany, of medium size (4ft. by 6ft., and thereabouts), but this variety seems to be more used in Belgium than in this country. Somersetshire alabaster is not worth speaking about. I quarried some at Blue Anchor, on the north coast of that county, in 1876, at the suggestion of the late Mr. G. E. Street, R.A., and used it largely in the restoration of the Mohun Chapel at the east end of Dunster Church, the renovation of which we had in hand at the time, but I have never cared to obtain alabaster from the same neighbourhood again, as it is not good enough for architectural or sculptural purposes. — Yours obediently,

HARRY HEMS.

IS OUR PRESENT SYSTEM OF EXAMINATION A FAILURE?

To the Editor of The Builders' Journal.

Harpenden.

Dear Sir,—I quite agree with your correspondent, Mr. Gloyn, that nervousness is a great drawback, but so are many other physical weaknesses, and they must be regarded in the same way. There are cases where nothing can be done to strengthen the nervous; but this is the exception, not the rule (the same with any other weakness). The system of examination must meet the requirements of the rule, not exceptions.

Furthermore, a very nervous man is not generally the one best suited for any particular post, though he may be the cleverest. This is especially the case with the Architectural profession and other occupations connected with the building trade. If a man is so nervous when he is before an examiner, what will he be should he be in the Law Courts? Little can now be done without an occasional dispute.

Some students will, no doubt, always resort to cramming, but this, I think, is minimised when a series of examinations is adopted, this insuring to some extent a course of study. The fact that similar questions are asked from year to year simply shows that the same course of study should always be followed. The questions asked at an examination cannot be arranged to suit the requirements of any particular class of students. It is, therefore, better to ask too much than too little, and so meet the requirements of all. What may apply to one examination may not apply to others. It is, therefore, difficult to discuss the system of examination in general.—Yours, &c.,

A. H. S.

MODEL ANSWERS TO EXAMINATION QUESTIONS.

Answers to Questions set in the Examination held by the Society of Architects in April, 1899.

By G. A. T. MIDDLETON and R. W. CARDEN, Associates R.I.B.A.

(Continued from page 105, No. CCXLI.)

IV.—CONSTRUCTION.

(Part I.)

1. *A church has to be built on light soil, and there is some doubt whether detached foundations for the columns would be sufficient. The columns being of Mansfield stone, 2ft. diameter and 16ft. from centre to centre, show what foundations you would recommend. Scale ½in. to 1ft.*

The nature of the soil is not sufficiently described for the question to be properly answered, nor is the source from which failure is to be apprehended indicated (whether lateral sliding, vertical settlement, &c.). If the soil were of a "pea-soup" consistency, as that near the docks in the East End of London, pile driving might be necessary, or a concrete raft over the whole site with metal joists embedded therein to stiffen it; or, if the soil were rather more solid, making the concrete continuous from one column to the next might suffice. Again, in the case of lateral movements it might be imperative to put inverted arches between the bases of the columns. The foundations as shown (see illustrations) should be sufficient for a detached column on any soil about whose bearing power there is only "some doubt."

2. *A trench, 4ft. wide and 10ft deep, has to be made in average soil. Give sketch of the timbering that should be employed, with figured scantlings. State what difference would be made if the soil were a running sand.*

The boarding (see illustrations) is shown 3in. apart. In a firmer soil the boards might be further apart still. For sand they would be placed close together, and, for very fine sand, the joints caulked roughly. The straining poles are cut rather longer than the space they have to span, and are forced into position so as to remain rigid. This being a "two-throw" excavation, the intermediate staging would rest upon the middle row of straining poles.

3. *Show how the thickness of a brick wall is determined, say for a warehouse, 40ft. frontage, with five floors above ground level and a basement, the heights from floor to floor being 10ft.*

Under the Model Bye-laws this is a building of the warehouse class, 70ft. high and less than 45ft. length, so that the base of the wall must be 22in., or 2½ bricks thick. Also, the uppermost 10ft. must not be less than 13½in. or 1½ bricks (the rule as to no storey having walls less than $\frac{1}{16}$ of the height in thickness does not apply), so that the wall may be as shown:—20ft. at 22in., 30ft. at 18in., and 20ft. at 13½in. There is no empirical rule.

4. *Give sketches to illustrate the following:—Hoop-iron bond, hollow wall ties, herring-bone bond, garden wall bond. How is the thickness of a concrete foundation determined?*

(The following slight notes would really in the examination be added on the sketches.)

Hoop-iron Bond (see illustrations).—There should be two for about each 1½ brick in thickness of wall, and they should be built into every fourth course. To be tarred and sanded. 1in. to 1½in by $\frac{1}{16}$in.

Hollow Wall Ties.—3ft. apart in every fourth course.

Herring-bone Bond.—Not suitable for walls less than three bricks thick, and is rarely used.

Garden Wall Bond.—Used in 9in. walls so as to obtain a fair face both sides, as, with three courses of stretchers to one of headers, only the bricks for heading course need be picked of the same size, the others being brought up fair by regulating the joint in the centre.

The simplest method of arriving at the requisite depth of concrete is that shown—drawing lines at 45deg. to the horizon from the top of footings until they meet perpendiculars dropped from the furthest projection of the base; these points of intersection give the required depth.

5. *The roof of a billiard-room, 30ft. by 20ft., is formed of rolled joists carrying a lead flat, with a lantern light in the centre, 14ft. by 7ft.; give vertical section through one side of lantern, showing connection with roof. Scale 1in. to 1ft.*

(We have assumed a 14in. by 9in. steel joist at each end of the lantern, and shown cross girders from these to frame the opening. The illustration to this question is double the scale of all the others shown on the page.)

(To be continued.)

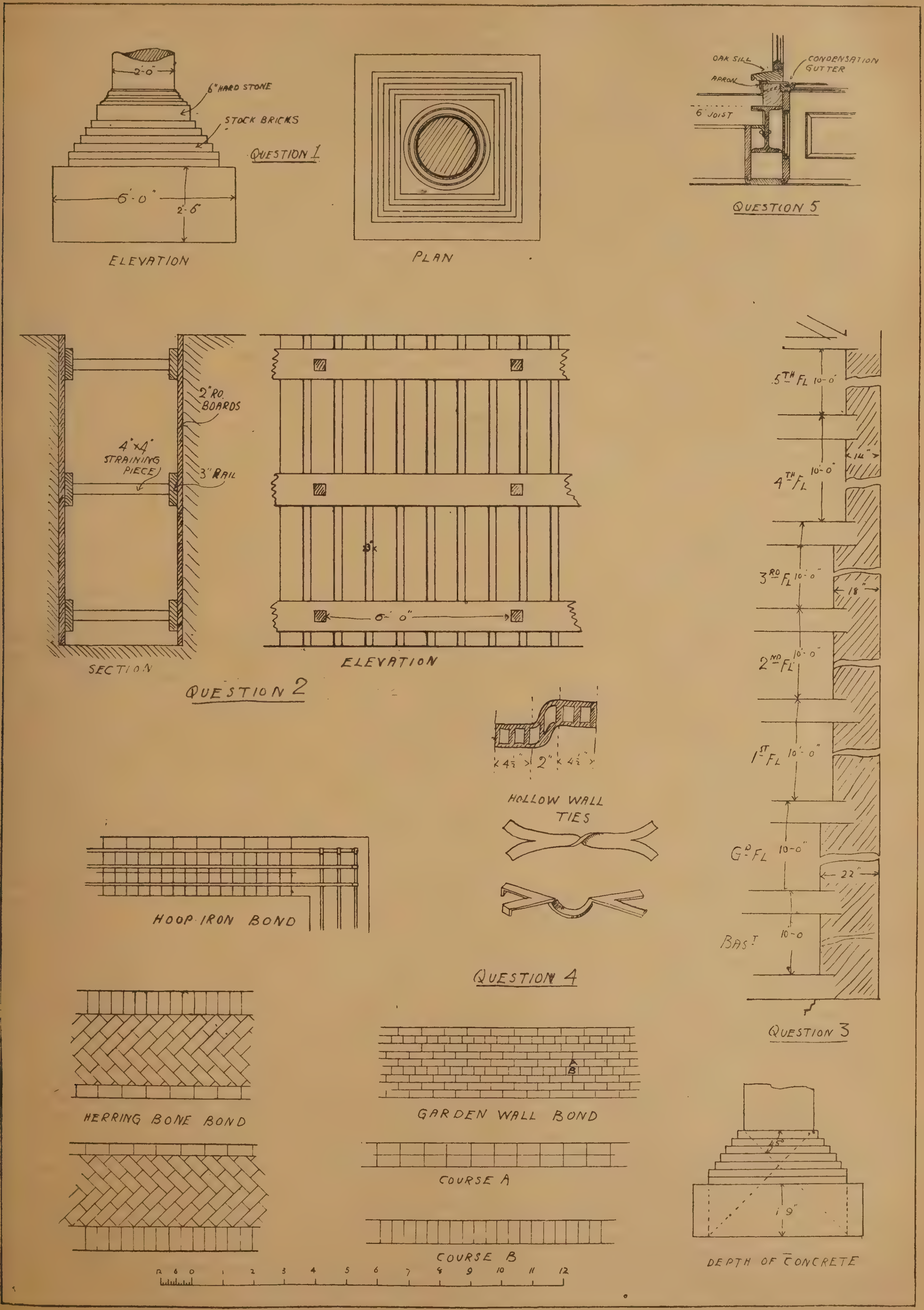
BUILDING TRADE LEGENDS.

Most persons have heard of the legend associated with the erection of cathedral and other edifices devoted to ecclesiastical purposes, that the Powers of Darkness always claim one human life as a sacrifice during the process of building, and there is hardly a cathedral or minster in the world which has not some such sinister legend associated with it. At Shottesbrooke, in Berkshire, the story runs that when the capstone was being fixed on the spire the architect called for wine to drink the health of the king, and that after drinking it he fell down and was killed. A coffin-shaped stone in the churchyard, bearing the letters "O! O!" his exclamation as he fell, is stated to denote the spot where he lies buried. The legend of St. Francis of Assissi, who rescued a poor mason from falling, and that associated with Sir James Thornhill's painting in the dome of St. Paul's are too well-known to need recapitulating.

Some of the legends handed down have reference to disputes among the workpeople. Thus, the church at Minchinhampton, Gloucestershire, is stated to have a portion of its roof formed of old gravestones, because there was a strike among the carpenters, and the woodwork in consequence could not be finished. Chesterfield Church is said to owe its distorted spire to the perversity of the builder, who built the church without adding a spire. Being compelled to finish the work, he constructed the spire in such a way that it has remained a curiosity ever since.

History gives us many legends of persons who, after being engaged in the construction of secret chambers, have been put to death to prevent their divulging the secret, while at other times it was the architect who was so treated to prevent him setting up any other building equally beautiful. Thus in the Church of Gouda, between Utrecht and Amsterdam, there is a beautiful window of stained glass, the tradition concerning which is that on its completion the artist's eyes were put out for fear any other church should have a window so grand.

W. N. B.



ILLUSTRATIONS TO ANSWERS TO EXAMINATION QUESTIONS 1 TO 5.

Bricks and Mortar.

Aphorism for the Week.

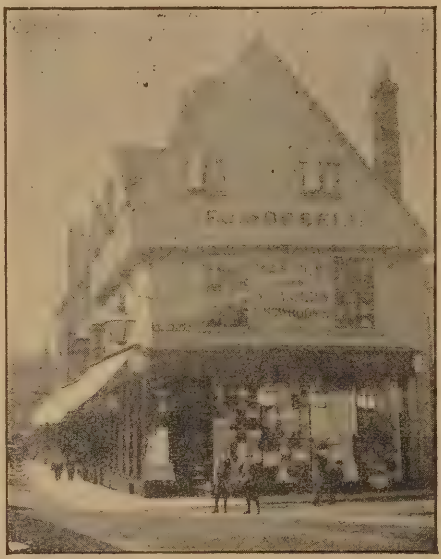
"Das einfach Schöne soll der Kenner schätzen;
Verziertes aber spricht der Menge zu."
—Goethe.

Lych Gate at Dovercourt. The lych gate erected by the Queen at Dovercourt Parish Church has been opened. The church has been thoroughly restored, and stained glass has been placed in every window except two. One of these is to be erected by the German Emperor, in memory of some men of the German Legion who died at Dovercourt after the Walcheren expedition, and were buried in the churchyard. The Queen's lych gate is to the memory of British soldiers. It is built of carved English oak, and is very massive. Messrs J. E. K. and J. P. Cutts, of London, are the designers, and Mr Edward Saunders, of Dovercourt, is the executor of the work. It bears the following inscription: "Erected by Her Majesty Queen Victoria, Empress of India, to the memory of British soldiers buried in this churchyard, particularly those who died from disease contracted during the Walcheren Expedition, 1809—1810." These words surround the Imperial Crown, and on the reverse side of the gate is the Royal coat of arms. Upon the cross in the front is also carved, "Blessed are the dead which die in the Lord," and "A.D. 1899."

Old Vauxhall Bridge. The demolition of Old Vauxhall Bridge is now completed almost to the water level. While at work on the abutment on the Westminster side Messrs. Pethick, the contractors for the work, came upon the foundation-stone. In the stone was a pocket containing a glass case. Inside this was a solid slab of silver, measuring 8in. by 5¼in. and weighing just 3lb.. on which the promoters of the bridge had inscribed their record. John Rennie, the architect of the bridge, also carried out Waterloo Bridge at a cost of nearly £1,000,000, against £259,681 spent on Vauxhall. The old Vauxhall Bridge was the first iron bridge built over the Thames, and Sir A. Binnie's design which is to replace it will be the first concrete bridge over the river. The old bridge has been found by Messrs. Pethick to have been most solidly and enduringly built. The overhead cable trucks have proved of the greatest service in removing material, and the contractors, who have also to reconstruct up to the springing line, contemplate using a double set of cables for the work of erection. Before the superstructure comes to be built it is to be hoped that the London County Council will allow architects some voice in altering the design regarding which so much dissatisfaction has been expressed.

Reconstruction of Thetford Town Hall. The work of reconstruction of the Thetford Town Hall revealed that the foundations of the County Court were so bad that it was necessary to take out the soft soil upon which it had been built and lay in a solid concrete bottom. At one of the corners of the building a concrete column has been sunk to a depth of 23ft. and steel girders have been laid. When the walls and floors of the large court and council chamber were cleared of plaster, it was found that the joists and timbers of the floor and the bond timbers were very much gone. In some cases the oak beams are to a great extent gone to powder. The walls appear to have been built of any material that came to hand—old chalk, tiles, brick on edge, and bond timbers—and are loose and cracked in all directions. In fact, there is very little sound work in the whole building, and it is quite clear that the jerry builder was known in the seventeenth century as well as at the present time. Several members of the committee charged with the work of reconstruction met the architect and clerk of the works, and made a very careful and minute inspection. After hearing the report of the architect, Mr. Green, it was unanimously resolved to take down the great court walls to the ground level. Mr. Green was instructed to go through his plans and see what modifications could be made consequent upon this decision. In the course of pulling down and removing two closets at the top of the first flight of stairs and at the rear of the big chimney, there was found, very many feet below, a large cesspool, and just above, on a piece of plaster work, was the inscription "G. B., January 31, 1800," these being the initials of George Burrell, a son of George Bird Burrell, a distinguished townsman and antiquarian of that period.

A Threatened Beauty Spot. On this page we give a picturesque view in the market place of St. Albans. This view is threatened to be marred by the alteration of the present shop in the centre. The block of tenements, of which this particular house forms the northern extremity, is rightly considered as the most picturesque relic of mediæval St. Albans, and the old plaster gable, with its overhanging upper story fronting the Market Place and St. Peter's Street, imparts to this portion of the town a character at once so quaint and beautiful that its destruction would prove most lamentable from an artistic and archæological standpoint. The building bears date 1637, but is probably earlier than that date. On the right of our illustration is French Row, with the gables and high-pitched roofs of the "Old Christopher"; in the centre the Clock Tower rises above chimneys and dormers; while dominating these is the grand old Norman tower of the Abbey Church. On Saturdays, the pictorial effect is enhanced by the ever-moving crowds of market people, and by the primitive hooded stalls laden with merchandise. A petition, signed by, amongst others, the Lord Bishop of St. Albans, Sir Arthur W. Blomfield, and the Mayor of St. Albans, has been sent to Messrs. Boots and Co. Limited, wholesale chemists, of Nottingham, who have bought the premises. The petition expresses the hope that in carrying out the alterations the firm will endeavour to preserve the characteristic features of the building, especially the north and east fronts, as they now exist. The managing director of the firm has replied courteously, promising to meet the petition if possible.



OLD ST. ALBANS: HOUSES THREATENED WITH DEMOLITION.

Preserving Ancient Monuments. It is to be hoped that the bill introduced in the House of Commons last session, "to amend the Ancient Monuments Protection Acts," will be passed without delay, for the above incident provides an instance of the need of such a measure. The object of the Bill is to empower the Council of any administrative county, if they think fit, "to purchase by agreement any monument (by which is meant any ancient or mediæval structure, or remains thereof) situate in such county or in any adjacent county," the same Council consenting, at the request of the owner, to become the guardians of any such monument, and undertaking or contributing towards "the cost of preserving, maintaining, and managing any such monument, whether they have purchased the same or become the guardians thereof or not." Another clause provides that "a monument of which the Commissioners of Works or any County Council have been constituted guardians shall not be assessed or rated to any county, or borough, or parochial, or other local rate or cess, or to income tax, or any other Imperial tax, and no such monument shall be chargeable with estate duty or any other duty, leviable on or with reference to death."

In Need of Preservation. The whole of the Monmouthshire estates of the Beaufort family have been in the market for private sale since last year. The property is only 26,000 acres in extent, but is remarkable for the large number of historic ruins it contains. It lies in a district of singular beauty, in that half of the country which is bounded by the Usk, the Wye, the Severn, and the Monnow. Perhaps its best known feature is the remains of Tintern Abbey, but besides this the estate embraces nearly every old castle of repute in the shire, which, being a border county, is rich in remains of early British stonework, Norman keep, and fortified Tudor hall. Tintern Abbey remains unsold, although several attempts have been made to secure it for the public. Usk Castle, said to date from Roman or Roman-British times, was sold by auction this last spring. The castle is mainly feudal in character, and still survives in its walls and towers, its inner keep, and in the more or less distinctly indicated baronial hall, and other living apartments. It has fortunately passed into private hands, from whom appropriate treatment may be expected. Within an easy ride of Usk is Monmouth Castle. The remains of the old Saxon fortress are now principally to be found in the cellars and foundations of the houses of Monmouth, the present building dating mainly from the time when the Dukes of Lancaster made it their seat. Further up the valley of the Monnow are the castles of Skenfrith and Grosmont, while at an angle with these on the road to Abergavenny is White Castle, by the village of Llandeilo. The Castles of Chepstow and Raglan are better known but have a comparatively modern history. Chepstow Castle will be offered for sale to-morrow. Near Raglan is Troy House, the work of Inigo Jones. The sale of these remains seems like the dispersion of a celebrated library or picture gallery, but there is the difference that there is a certain organisation to which the tax-payer makes direct contribution for the acquisition of rare books and noted works of art. A beautiful historic ruin is of interest to thousands of persons, whereas a rare manuscript interests but few; yet the National Trust, formed but recently, is the only organisation for the preserving of such relics, and this is purely voluntary.

The New Cathedral. London is the place of great undertakings. Reference has already been made in these columns to the new Roman Catholic Cathedral in course of erection at Westminster; but now that it has been carried roof-high, the general body of the structure and the character and size of the building can be viewed from the streets surrounding the site. When it is completed this huge Byzantine Cathedral will become one of the sights of the metropolis, and will no doubt be given a prominent place in the guide books, enabling ravaging sightseers to rush in and repeat book-read opinions about the building in the same way as Mark Twain's pilgrims. Cathedral building is always a slow process, and it is impossible to say exactly when this one will be completely finished; but it is anticipated that it may be opened for worship on September 29th, 1900—the golden jubilee of the Roman Catholic Hierarchy in England. The roofing has been begun, and will probably be completed by the end of the year; some of the minarets and domes are almost finished; and the lofty tower, which will form a striking feature of the building, has been carried to about half the intended height. The nave is the largest in England, having an area of 14,040 square feet, as compared with the 13,244 square feet of York Minster. During the recent Greco-Turkish war some exquisite Grecian marble columns were seized in Thessaly by the Turks; these have been brought over, and will be used for dividing the nave from some of the chapels of the new cathedral.

A Big Scheme. The vice-president of the import section of the Cardiff Chamber of Commerce (Mr. J. Kyte Collett) comes forward with an improvement scheme on a very liberal scale, so liberal, in fact, that it is considered to be impracticable for the present. Here are the chief features of it:—(1) The making of an underground self-working double canal from the West Bute Dock to the Crown Patent Fuel Works; (2) the levelling up of the supplanted canal for thoroughfares and building sites; (3) the widening of the river Taff, and the formation of an embankment on its west side; (4) the building of a western sewer on a system to combine the services of a sewer gas consumer, a refuse destructor, and an electricity generator; and (5) the opening up of the Leckwith Moors for manufactories. Mr. Collett claims that by this plan Llandaff, Penarth, and Cardiff would be brought nearer to each other, with the idea of forming one large city. A Napoleon may re-organise a continent, and Mr. Collett may propose gigantic improvements, but, unfortunately, all these things require an immense amount of money, and as the town of Cardiff is already committed to several costly schemes, this new one will, we fear, be received with much head-shaking when those in authority see the number of figures at the bottom of the estimate.

Prospective Fire Tests. The arrangements of the British Fire Prevention Committee for the winter session will again include a comprehensive series of fire tests, to which it has also been decided to invite distinguished guests from abroad, the almost international interest accorded to the work having led to a number of applications from foreign officials, architects, and engineers to attend the experiments. In October there will be further investigations with doors of various materials, with floors, patented partitions, and non-flammable materials. The operations of the testing station will then probably be extended to experiment with automatic fire alarms. An entrance fee will be shortly instituted, in addition to the annual one guinea subscription. Membership will henceforth also give the right to copies of of the reports of the testing station beyond the ordinary publication of the committee. Special arrangements have been made by which local authorities can take up membership if represented by an individual member or official, and several local authorities have already availed themselves of this facility. Mr. Geo. E. Monckton has again resumed his duties as secretary to the committee, which he had to relinquish in February last owing to ill-health.

St. Leonard's Church, St. Andrews. The ruin of St. Leonard's Church is claimed by the heritors to be a repairable church. The church consisted of a nave 86ft. long by 20ft. 7in. wide internally, a western tower standing on ground about 25ft. 6in. by 15ft. all over, a sacristy about 24ft. by 9ft. 6in. internally, and possibly a small south transept or porch, which could not have exceeded 12ft. in size from east to west. The existing structure measures internally 80ft. by 20ft. 7in. The church had the roof taken off about the year 1763, and has remained in that state ever since. At the same time all the interior woodwork was removed. The tower of the building was demolished in the latter part of last century by Principal Watson. In 1840 Sir David Brewster was permitted to take possession of 9ft. of the west end of the church, agreeing to restore the space if ever the church was rebuilt. Part of the north and south walls was also taken down by him, by which operations the nave of the church was shortened by, it is thought, 6ft.

The Sacristy. The church possessed a sacristy or session house, an old building in the shape of a "tofall," against the north wall. It communicated by a door through the wall, now built up, on the session house side. It is this sacristy that the heritors' agent (Mr. J. Ritchie Welch) stated to the sheriff recently that the heritors were willing to acquire. The University Court have agreed to contribute £1,000 towards the restoring the old church. If it is decided that a church must be built elsewhere than on the site of the old one, the heritors will lose the benefit of this sum, besides being forced to build an entirely new church at a cost of between £4,000 and £5,000, whereas the cost of repairing the old church, according to Mr. Ritchie Welch, would only be about £1,400.

Statue of the Duc d'Aumale. The equestrian statue by M. Gerôme of the Duc d'Aumale has been completely cast in bronze, and has been conveyed to Chantilly, where it will be erected at once, and unveiled in about a week's time. The Duke, in full uniform, is saluting with outstretched arm, hat in hand. The figure is rendered with extreme finish of detail, but at the same time with great breadth and simplicity. The charger is a fine piece of sculpture, and the animal, which has been brought to an abrupt halt, is wonderfully natural. The statue, the bronze material of which has been finely gilt, will be erected in the Park of Chantilly. The artist has plainly striven to give the impression of life and motion in the figure of the soldier, and in the charger which he is riding.

Prodigious! In many parts of New York there are what might be called forests of lofty structures; but a building has just been raised which must surely overtop all the others. It is the Park Row Syndicate building to which we refer. This building is somewhat irregular in plan, having a frontage of 104ft. on Park Row, and extending backward a distance of 178ft. Buildings of twenty storeys spring up like mushrooms in New York, but this one runs up to twenty-six storeys from the ground level to the main roof, five storeys in each of two towers at each side, and one storey in each dome. In addition there are a tenement and sub-cellar below ground, making a total of thirty-four storeys in all. The height of the building is 424ft. Pile foundations are used throughout, and the total weight of the building is estimated to be about 65,000 tons.

Model Flats. A French syndicate has been formed to construct model flats in New York that will be leased at a price within the means of working men. All the plans have not yet been drawn, but to some extent ideas will be followed which are introduced in the model tenements now almost constructed in the Broux with money invested by the Baroness de Hirsch. In the de Hirsch apartments the suites of rooms vary from three to six, and the rental has been fixed at from 6dols. to 15dols. a month. Every suite has a private bathroom, and opens either on the street or a wide courtyard. All have steam heat and electric light. On the ground floor are a model meat shop, grocery store, and bakery, at which the lowest prices are to be charged that will make the stores a little more than self-supporting. The company is capitalised at 10,000,000dols., and expects that between six and eight per cent. interest will be obtained on the money invested.

Carisbrooke. Since the end of last year, Mr. Thomas Cochrane, the Deputy Governor of the Isle of Wight, and Mr. Percy Stone, F.S.A., have been superintending the restoration work at the Royal Castle of Carisbrooke, and the castle has now recovered some of its old dignity. Carisbrooke, it is truthfully said in the "Daily Graphic," is one of the most beautiful of ancient ruins, and all who know the Isle of Wight will be glad to hear that it is being gradually rescued from the degraded state into which it had been allowed to fall. A movement is now in progress to restore the Church of St. Nicholas-in-the-Castle, which was rebuilt by King II. in 1738, on the site of the ancient church endowed in 1806. In 1860 the roof of the church was taken off and the seats removed. It is now proposed to restore the ruined church in memory of King Charles the Martyr, who was imprisoned in the castle.

Preservation of Footpaths. The preservation of the footpaths in England and Wales is a big undertaking, and the National Footpath Preservation Society should always be helped and never hindered in its work. There are numbers of these footpaths, says the annual report of this society, "yearly closed for want of enlightened opinion. Instances are constantly accumulating in the Society's record where effective advice might have secured to posterity rights which, once lost, can only with the greatest difficulty be ever regained." There is little chance of successfully protesting against the closing of a path in which there is a common interest, when once the opportunity has been lost, without incurring serious outlay in law costs. The secretary of the society points out, in an appendix to the report, that if a Parish Council is satisfied that any right of way within its area has been obstructed it can appeal to the District Council, or, if necessary, the County Council, to take proceedings. The Parish Council can also repair gates or stiles on a public footpath, although they may form part of a private fence.

Clare Church Tower. One of the most beautiful churches in Suffolk is that in the parish of Clare. The tower of this church has been for some time in a most perilous condition, the core being practically rotten about 10ft. from the base. The lower part of the tower is thirteenth century work, and the upper part is of fifteenth century construction. It was evidently originally contemplated to hang only one or two bells in the belfry, and the hanging of a peal of eight bells, in a slovenly manner, subjected the tower to an overwhelming strain. Deep fissures appeared on every side, the buttresses cracked and bulged, while the turret was separated as if by a knife from the rest of the building. The keystone of the fifteenth century window in the front of the tower was cut right in half, and the weight of the tower consequently resting on the window instead of on the arch, it was a wonder that the whole did not collapse.

Its Restoration. The tower was inspected by architects, who pronounced it to be in a hopeless state, and that the best thing to do would be to pull it down and re-build it. The Rev. James Vatcher, the vicar, did not follow this advice, but consulted Mr. Detmar Blow, the architect of the Society for the Protection of Ancient Buildings. Mr. Blow promised that he would preserve the building without any injury to its external appearance. This he has done, and the tower is now in a substantial condition. The tower, which is 77ft. in height, and 4ft. thick at the base, tapering to three at the summit, was built of flint and rubble. The work of restoration involved the scooping out of the old core and the insertion of concrete blocks of Portland cement and tiles, which were solidly united to the outer shell by the pouring of grout in the interstices. The strength of the structure has been further increased by bonds of the best blue Staffordshire bricks, which line it in places, and also secure the turret to the tower, and the latter again to the church. Altogether, it is estimated that 43,000 bricks have been used, besides all the old flints which have been put back. The work was commenced on July 4th of last year, and has just been concluded at a cost of £1,160, £300 more than was estimated, the excess being partly due to an increase of masons' wages by 12 per cent., and partly to the fact that the old wall turned out to be rotten to a greater extent than was thought. The blue bricks were supplied by Messrs. J. Knowles and Co., of London; the red bricks by Mr. Garrett, of Cavendish; the tiles by the Burham Brick and Tile Company; and the cement by Messrs. Gibbs and Co., of Grays.

St. Bartholomew's, Birmingham. The Church of St. Bartholomew, in Masshouse Lane, Dale End, has been considerably beautified under the superintendence of Messrs. Franklin, Cross, and Brookes, architects, Temple Row, Birmingham. Three stained glass windows have been placed in the east end, which have been recently removed from St. Peter's, Dale End. The subject of the centre window is "The Ascension." The side windows represent a chalice and a dove respectively. The windows were originally designed by Mr. F. Pemberton, of Birmingham, and have now been adapted, with slight alteration, and fixed in their new positions by Messrs. J. R. Lee and Co., Limited, Paradise Street, Birmingham. The appearance of the interior of the church is greatly enhanced by the addition of the windows. A handsome font has been presented to the church by several persons who have been baptised there. It is of Bath stone, and stands on four square columns, with Ionic carved capitals in Caen stone. The base and step are in Darley Dale stone; the bowl is octagonal in shape, and is moulded and fluted. The font has been designed to harmonise with the style of the east end of the church.

Reconstitution of Pompeii. The Paris correspondent of the "Times" writes that the Chevalier Pesce, the architect of the Italian Embassy in Paris, proposes to reconstitute, at the Universal Exhibition, Pompeii—not the Pompeii of the familiar ruins, but the brilliant city as it existed before the stream of fire from Vesuvius buried it from sight. This project has been in preparation for the past two years, and the most eminent men in all branches of Art and Science, have unhesitatingly promised their support to M. Pesce. "He proposes to restore to us the life of the forum, the camp, the gladiators, the Temple of Isis, the theatre bordering on the forum, the numerous shops and public baths, and all those houses, squares, and open spaces where formerly were concentrated the life, the activity, the pleasures, the celebrations and public spectacles which made this watering place by the Mediterranean one of the most attractive spots in the Italian peninsula. No detail in the life of Pompeii known to archæology in the period before the disappearance of the ancient town seems likely to be neglected in this magical evocation, and the spectator wandering across the city will find himself suddenly in the midst of that ancient life which, without this artificial aid, it would be so difficult even for the most learned imaginations to evoke. Numerous actors, in costumes archæologically accurate, will give to the city its former animation."

Ptolemaic Monuments. The shaft of a handsome rose granite column was discovered at Alexandria about twenty years ago, and presented to the municipality, but no use was made of it until recently. Dr. Schiess Bey, director of the Government hospital, offered to erect it on a prominent site near the hospital, from which it is visible far out to sea, taking upon himself the responsibility for all risks and expenses. His excavations resulted in finding the capital almost uninjured at 30ft. distance from the shaft. The length of shaft is over 34ft., with a diameter of 3½ft., and a weight of 27 tons. The base, a separate piece, is 2ft. 4in. in height by 5ft. 5in. in diameter, and the capital, which consists of two pieces, is 4ft. 6in. in height by 7ft. 9in. in diagonal breadth. One side of it is not carved, but has cuts made for inserting metal cramps, as though it was originally attached to a building, the capital considerably overhanging the base of the column. The monument when completed will measure 55ft. 7in. from the ground to the summit. The column is believed to have belonged to the temple of Saturn, which early in the fourth century was transformed into the Church of St. Michael. An inscription stating that it has been erected in commemoration of the fall of Omdurman and Khartoum, on Sept. 2, 1898, has been placed on a scroll deposited in the pedestal of gray stone, built to support the column. Another monument, also due to the initative of Dr. Schiess, is a beautiful marble column with a composite capital of green granite which he discovered during his excavations in ground belonging to the hospital. This column he erected in 1897 to commemorate the Queen's Jubilee. It stands on a knoll in the hospital garden overlooking the sea, and bears on the pedestal the following inscription: "Victoriae Britt. Reg. Fid. Def. Ind. Imp. Ivn. xxii a.d. mdcccxcvii."

The Church of the Sacred Heart, Paris. The last column of the cupola surmounting the Church of the Sacré Cœur, Paris, was placed in position on Sunday morning, last week. The edifice externally is now practically finished, with the exception of the erection of the huge cross that is to crown the central dome. The foundation stone of the building was laid in June, 1875. The interior decoration of the church is hardly begun, and it is said that it will take twenty years to complete it. Up to the present time about 1,300,000 francs have been spent on the basilica, and it is thought that as much again will have to be spent before it is definitely finished. The bulk of this sum has been supplied by private subscriptions and gifts.

A Chance for a British Firm. At the time of the recent plasterers' strike the Americans thought of sending metal walls and ceilings, which do away, to a great extent, with the use of plaster, and remove the unsightly cracking and damp stains which very often appear. Mr. Consul Powell, in his report on the trade of Philadephia in 1898, says that "the plated ceilings also, besides being extremely decorative, are a very great protection against fire. I venture to hope that before these American metal walls and ceilings can be placed on the market in Great Britain some enterprising British firm may be equal to supplying the requirements of the British public. I am informed that there is a firm in this country who are turning out large quantities of paper tiles, which are used for roofing, but I am unfortunately not in a position to give details as to the process of manufacture. They are reported to be very hard and tough, and the glazing appears to be of the nature of Japanese lac. They are reported to be exceedingly cheap, and can be fashioned in any colour or shape to suit the purchaser."

Barrow Conservative Club. The new Conservative Club at Barrow-in-Furness, which has been erected by Sir Charles Cayzer at a cost of about £10,000, was opened recently. The building, which has been designed on the lines of the architecture of the seventeenth and eighteenth centuries, has a handsome and imposing appearance. The main entrance opens into a vestibule and large entrance hall, from which wide corridors lead to the reading room, smoke room, billiard room, bar, and lavatories. The reading room, when occasion arises, may be used as an assembly hall. From the entrance hall a wide stone staircase leads to the first floor, where there are the secretary's office and committee rooms, from which there is access to a balcony. From the corridors on the ground floor entrance may be had to the Queen's Hall, a room capable of seating over 500 persons. A large gallery faces the platform or stage, on which there is sitting room for about eighty persons. It is a lofty room, well lighted by a spacious lantern roof and heated with hot water pipes. This hall may be made entirely independent of the club premises, and from the platform there is a retiring room, and below the stage are cloak and dressing-rooms.

Professional Practice.

Aston.—A new church, which has been erected at the corner of Frederick Road and Whitehead Road at a cost of £5,000, was opened recently by the Bishop of Worcester. The nave of the new structure is 83ft. long and 21ft. wide, and divided from the aisles by arcades each of five arches. The aisles are 72ft. long and 13ft. 6in. wide; width of church inside from north to south, 52ft.; north and south transepts 32ft. 6in. wide. The chancel, which is apsidal, is 32ft. by 19ft. 6in., and there are north and south chancel aisles; that on the north is used as an organ chamber. There is a well-proportioned chancel arch. The church is very bright and cheerful, and has a large west window and clerestory window, and the effect generally is good and substantial looking. The building is faced inside and out with white Leicester bricks, with bands of red Leicester bricks. The windows and columns of arcades and copings are of Bath stone. The work has been well executed by Mr. John Webb, of Villa Road, Handsworth. Messrs. J. A. Chatwin and Son, of Birmingham, are the architects; Mr. Meredith, of Aston, was clerk of works; the heating apparatus was supplied by Benjamin Parker, Limited; and Messrs. Thomason and Co., of Graham Street, made the gas pendants, &c.

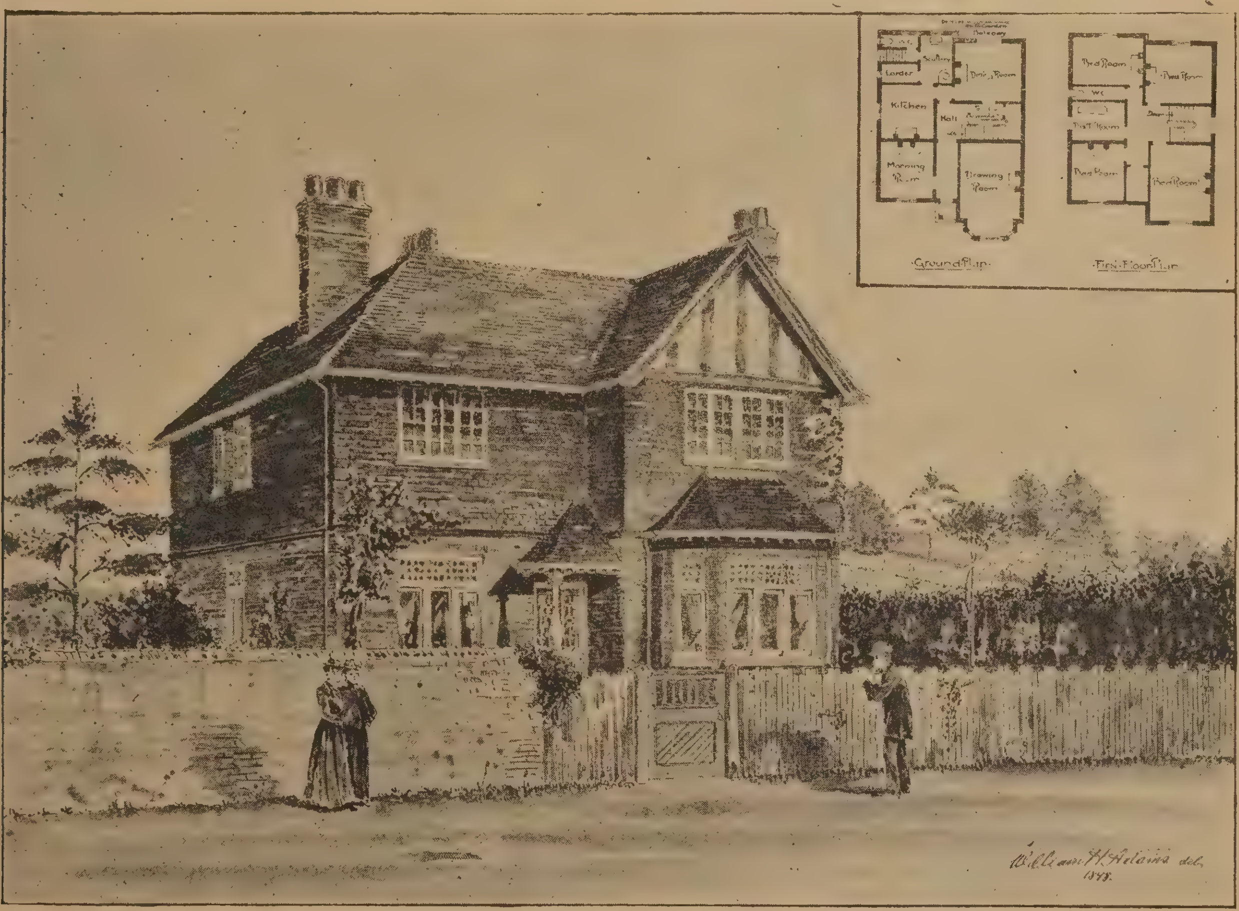
Dorking.—The small house illustrated on the next page has recently been completed for Mr. R. Adams at Dorking, on rising ground commanding a good view of the surrounding hills. Owing to the levels extensive cellerage is obtained. The materials used were red sand faced bricks of a good colour, and the upper part hung with tiles, with portions in rough cast. The builder was Mr. J. Pledge, and the architect Mr. William H. Adams.

Edinburgh.—The plans have been passed for the John Usher Institute of Public Health, which is to be erected, at a cost of £20,000 (provided by Sir John Usher, of Norton), on a site facing Warrender Park Road. A continuation of Spottiswood Street to the south will run alongside the building on the east side, and a new street—Lauderdale Street—will bound the ground on the west. The front of the building will stand back a considerable distance from the street. The building will consist of three storeys, in which will be provided a museum, large chemical and bacteriological laboratories, a lecture theatre, reading-room, and numerous rooms for scientific purposes. The extract ventilation from the rooms and fittings will be taken direct to the roof by means of fans and the building generally will be heated by hot water. The flooring throughout will be fireproof. The Institute has been planned after careful examination of similar buildings in this country and on the Continent. The walls of the principal elevations are to be built of grey stone ashlar from Doddington Quarry, lined with hollow brick inside. The exterior has been designed in a phase of classic Renaissance, taking the form of two end blocks connected by a recessed centre part. The roofs are to be covered with red tiles. The contracts having been arranged, the work will be commenced at once. A considerable portion of the ground, which altogether is about 250ft. long. and 110ft. broad, will be reserved for extensions. The architects are Messrs Leadbetter and Fairley Edinburgh.

Newcastle.—On September 29th the Bishop of Newcastle consecrated the new church of St. Gabriel's in Heaton Road. It is to take the place of the present iron church, which was erected at the east end of Rothbury Terrace in 1890, and has for long been entirely inadequate to meet the wants of the neighbourhood. Only about one half of the scheme in connection with the new church has been carried out, the cost of the structure dedicated being about £5,000. The completion of the full design, including tower, &c., is estimated to raise the total cost to about £10,000. An Order in Council, which will be made in November, will create the new parish of St. Gabriel's. The new church, when complete, will consist of nave, with north and south aisles, transepts, chancel, morning chapel, baptistry, organ chamber, vestries, &c. The design includes the erection of a fine tower on the north side of the church. The complete church will accommodate 1,000 worshippers. The dimensions will be: Length from east to west, about 150ft.; breadth across the naves and aisles, 55ft.; breadth across the transepts, 114ft. The nave arcade is of moulded stone, with shafts joining a hammer beam roof. The clerestory and other principal windows are worked in open tracery. The baptistry, situated immediately to the west of the south porch, is apsidal. The morning chapel, situated at the east end, is also apsidal, and will be fitted with inclosing oak screens, as also will the arcading between the chancel and the ambulatory. The floor is of solid concrete covered with wood. There are five doors to the church for ingress and egress. The whole edifice will be built of stone, and the roofs covered with green slating. The interior wood fittings, and especially the benches and screens in the chancel, morning chapel, and baptistry, are intended to be in oak—marble, alabaster, and bronze being used for other fittings. These, with stained glass windows (which are at present glazed with plain glass), will afford abundant opportunity for individual generosity. The church is designed in the style of architecture which prevailed in England in the fourteenth century. Immediately to the west of the church, the vicarage will be erected, and space has been allotted on the church site for a parish room, &c. Considering the very fine site these buildings will occupy, they should form a very dignified and picturesque group. The portion of the church as already built consists of nave, south aisle, and porch only, and will accommodate 500 worshippers. The short chancel and vestries are temporary. The stone of which the church has been built has been obtained from several quarries, chiefly from Burradon and Blaxter on Ottercaps. The internal fittings are all of the most temporary nature, all resources having been devoted to the permanent building. Mr. Frank W. Rich, of Newcastle, is the architect.

Sunderland.—On December 8th, 1897, after several years' consideration, the Sunderland Town Council decided to erect a technical college. The site in Green Terrace was purchased in March, 1896, for £3,150. Mr. J. M. Brydon, the architect for the new Government offices at Whitehall, was nominated by the President of the R.I.B.A. to adjudicate on the plans, and upon his recommendation those of Messrs. Potts, Sons and Hennings were selected and secured the first premium of £100. For the building and part equipment of the college, the tender of Mr. John White, of Sunderland, amounting to £18,560, has been accepted. The building has been designed in the English Renaissance style and so that all the departments of the college may be readily reached and be under the easy supervision of the officials. The main corridor will be 8ft. wide and the examination hall 50ft. by 30ft. Over the large hall is the chemical laboratory, 71ft. by 30ft. There is a clear space in this room of 29ft. to the ceiling, which contains a turret covering an extract ventilator to convey fumes from the benches. Space is provided here for eighty-four workers, while the chemistry lecture theatre is designed to seat sixty students. The physical laboratory, the preparation room, and the physics lecture theatre are situated in the basement. The corner block has been carried up as a dwarf tower, providing an observatory. The college will have an extensive curriculum. The authorities of Durham University have been approached with a view to a connection being established between the two institutions that would enable the students at the Sunderland college to take the Science of Arts and Letters degrees with the least possible trouble and expense, and it is probable that an application for affiliation will be made by the Sunderland authorities, to be followed by incorporation if the requirements of the Durham senate are complied with. In the latter case Sunderland students will be as favourably placed, so far as science degrees are concerned, as their brethern at the Newcastle College of Science. The foundation stone of the new building was laid on September 27th, and the work is expected to be finished in the spring of 1901.

Wolverhampton.—A new swimming bath has been built at the side of the old baths in Bath Place by Messrs. Wilcock and Co., of Wolverhampton, from designs by Mr. Bradley, the borough engineer. The bath itself is 81ft. by 31ft., and is roofed over with a single span, and lighted by a skylight of rough plate glass. On the sides of the bath there are windows provided, in which electric lamps will be placed to light the bottom—an ingenious contrivance. There is a gallery on three sides of the building. The prominent feature of the main elevation is a large gable with circular windows. The building is built of brick with terra-cotta dressings.



A HOUSE AT DORKING. WILLIAM H. ADAMS, ARCHITECT.

The Crystal Palace School of Art has just commenced its fortieth session. A more extensive suite of rooms than those previously occupied has been set apart in the south wing for the students.

The Smithfield Martyrs' Memorial, which was erected at St. Bartholomew's Hospital in 1870, and provided by the Protestant Alliance, has been renovated, and was recently unveiled by Mr. B. Nicholson, of the Executive Council of the Alliance.

Keystones.

A New Church at Brynmaen, Colwyn Bay, has been built, at a cost of £10,000.

The temporary Bridge at Kew will not be opened before October 16th.

A Bunyan Memorial Window is shortly to be erected at St. Saviour's, Southwark, S.E.

A New Church at Woolmer Green, Herts., is being erected at a cost of between £3,000 and £4,000.

A New Station at Stannergate, Dundee, is being erected by Messrs. D. P. How and Son, at a cost of £7,000.

A Crematorium at Leeds is proposed to be built, and a committee is now gathering information on the subject.

Medmenham Abbey, Bucks., is for Sale, after being restored at a cost of £10,000. It was founded by the Cistercians in 1200.

A handsomely-carved Oak Pulpit has been removed from Curzon Street Chapel, Mayfair, W., to the parish church at Penn, Bucks.

Kirkstall Abbey, Leeds.—A waiting-room, a tramway office, a lodge, and an ornamental gateway are to be erected near the tram terminus at Kirkstall Abbey at a cost of £2,833.

A New Organ at the Church House, Westminster, S.W., has been erected in the Great Hall, and Sir Walter Parratt will give a recital on it on October 7th. It has 1,774 pipes, and is enclosed in an oak case designed by Sir Arthur Blomfield.

A New Wesleyan Church at Penarth is being erected at a cost of £7,000. Messrs. Jones, Richards, and Budgen are the architects, and Messrs. Jones Bros., of Cardiff, are the contractors. The foundation stone was laid on September 27th.

Big New Wharf on the Thames.—The Dundee, Perth, and London Shipping Co. are now building a new wharf at Limehouse, E., at a cost of £100,000. It will take between two and three years to complete.

Proposed Improvements at Nottingham.—It is proposed to set back the building lines of High Street, so that this street will be more than double its present width. The proposal has been under consideration for years, but is now coming to a head.

A New Theatre at Berndorf, erected a year ago by Herr Arthur Krupp, for the workmen employed at his huge metal factories, was opened on Wednesday. The theatre is in old German style and is decorated in excellent taste, the prevailing colours being white and gold. There is accommodation for 500 persons.

A Diminutive Village is that called Perivale, which lies two miles north of Ealing. It is 626 acres in extent, and consists of thirty-four inhabitants, who occupy five houses which have at sundry times been built. The village boasts of a church, which is a quaint-looking edifice, picturesquely surrounded by trees.

The Loan Collection of the Artists' Guild Exhibition, to be held at Albert Hall in November, under the patronage of her Royal Highness Princess Christian of Schleswig-Holstein, is under the direction of Lady Agneta Montagu, who will be extremely obliged if anyone willing to contribute eighteenth century plate, miniatures, snuff boxes, Battersea enamels, or other *objets d'art*, will communicate with her immediately at 69, Eaton place.

The Doge's Palace at Venice.—A correspondent to the "Times" points out that the statement made by the Rome correspondent of that journal to the effect that Cavalieri Boni, director of the Forum excavations, restored the Doge's Palace at Venice is incorrect. Signor Yendrasco, of the Public Works of the Kingdom of Italy, did the work, Boni being a young draughtsman under him. It is a stupendous piece of civil engineering, probably the best piece of restoration ever done.

York Minster.—Nearly £12,000 has now been received towards the cost of restoring this Minster.

Frome St. Quinton Church has been restored from designs by Mr. J. Nicholson Johnston, architect, of Yeovil.

The Smoke Nuisance.—For causing black smoke, about eight Manchester firms were fined on September 27th.

The Statue of Daniel Owen, the Welsh novelist, is to be executed by Mr. Gosforth John. The model is now nearly finished.

The Famous Muckross Estate, embracing the Lakes of Killarney, will be put up for sale by public auction on November 28th next.

Mr. Geo. Pearson, architect and surveyor, formerly of 32, Finsbury Pavement, E.C., has removed to new offices at 58, Moorgate Street, E.C.

The Jules Simon Statue.—The French sculptor Frémiet has completed his sketch of this work, which is to be set up in the Place de la Madeleine.

The New Blea Tarn Reservoir, to supply Lancaster and Morecambe, is now nearing completion. It will hold 120 million gallons, and is costing £60,000.

Building Accident.—At Dunoon, on September 26th, a wall about 15ft. high collapsed (on account of the wet weather), burying two workmen, both of whom were injured.

Westminster Bridge is being painted at a cost of £4,000. The metal grooves running alongside each kerb are to be removed and concave channels will replace them.

A Fire at a Kilmarnock Brickworks, belonging to Messrs. Gilmour, Morton and Co., Ltd., occurred on September 28th. About a thousand pounds' worth of damage was done.

Two New Piers for Floating Fire-engines—one near Blackfriars Bridge, the other at Deptford—are now being erected for the London County Council at a cost of about £1,500.

Bath Abbey.—At a meeting held on September 29th, it was finally resolved to proceed with the restoration of the west front at a cost of £2,000. Mr. Jackson is the architect in charge.

A New Park at Glasgow, called Richmond Park, extending for forty-four acres on the south side of the Clyde, was opened on September 27th. The purchase money was £44,000.

Improvements at Plymouth.—A Local Government Board inquiry was held at Plymouth on September 28th with regard to certain sewage and street improvements, estimated to cost £44,300.

A New London Park.—The Ealing District Council have decided to purchase the Manor House and park adjoining Ealing Green and Lammas Park, at a cost of £40,000. The Manor House is a fine specimen of Inigo Jones's work.

A £300,000 Scheme for Southend.—The Southend Town Council are pressing forward a scheme for widening the Marine Parade, and for constructing a long sea wall to form a marine lake in which a certain depth of water can always be kept.

Another Hampstead Landmark to be Demolished.—The house at the corner of West End Lane, Hampstead, N.W., known as "The Chimes," has been sold with the estate on which it stands. It was built from Pugin's designs for the eccentric Royal Acadamician, J. R. Herbert, who named it after Dickens's famous Christmas story.

A New Paris Art School.—An American School of Fine Arts, Music, Singing, and Declamation will shortly be inaugurated in Paris. The institution is in the Avenue d'Iéna, and has been taken up by the Government at Washington as the result of the efforts of an American lady, Miss Mathilde Smedley. It is stated that forty-five American States will send over ninety students to form the nucleus of the school, and that it is contemplated to build a palace to accommodate five hundred students, at a cost of £200,000.

A Statue to Richelieu is proposed to be raised at either Poitou, where the cardinal received his political education, or at Lucon, the episcopal throne of which he occupied.

A New Organ for St. Augustine's Church, Sheffield, is to be built, at a cost of about £800, by Mr. Albert Keates, of Charlotte Road, Sheffield. The church itself has only recently been erected.

Smoke Prevention in Berlin,—At present there is no Smoke Act in force at Berlin, but it is announced that after January 1st, 1900, reforms will be introduced, and no black smoke will then be allowed.

The Statue of Mr. Gladstone by Mr. Adams Acton, who was commissioned by the Gladstone Memorial Committee at Blackburn, is finished, and will be unveiled by the Earl of Aberdeen early in November.

Alterations to the Royal Vaults at Windsor are now being carried out by command of Her Majesty. They are beneath St. George's Chapel. An arched doorway is being put up at the entrance, and the electric light is being installed.

Belfast Shipbuilding Accommodation.—It is reported that the Belfast shipbuilders are in negotiation with the North British Railway Co. for the purchase of Seafield Docks, Kirkcaldy, and a large area of adjacent land, for the purpose of removing a part of their works from Belfast.

New Thames Lock.—At a recent meeting of the Hammersmith Vestry a report was presented from the conference of local authorities convened to take steps for the construction of a new lock on the Thames below Wandsworth. The proportionate cost to Hammersmith is £29,995, and the cost is estimated at £220,000. It was agreed by the Vestry to contribute its proportion of the cost as specified.

New Seamen's Institute.—The Missions to Seamen Society have purchased what was formerly a public-house, opposite the Board of Trade Shipping Office, near the Victoria Docks, and are converting it into a free institute for sailors and fishermen. Expensive drainage works have been effected, but the necessary alterations and equipment of the building have now been stayed for lack of an additional £200.

New Memorial Window.—A window has been placed in the church at Scrivelsby, Lincolnshire, by Mrs. Dymoke, in memory of her late husband, Francis Seaman Dymoke, the Queen's Champion. Before the time of George IV. it had been usual for the Dymokes, after performing the office of Champion at Coronations, to receive the honour of the Bath, but that custom then ceased.

Opening of a Church at Dunfermline.—About three years ago a dispute arose in the Viewfield Baptist Church, Dunfermline, and as the result a section of the congregation left and have since worshipped in halls. In the interval a church, with 500 sittings, has been erected at the south-east end of Dewar Street at a cost of about £2,000. The edifice, which is to be known as the West Baptist Church, has recently been opened for public worship.

Cheltenham's Art Gallery.—The Earl of Rosebery has provisionally consented to formally open the new Municipal Art Gallery at Cheltenham at the end of October. This building has been erected as a memorial of the Diamond Jubilee, and was presented to the town by Baron de Ferrieres, who has stipulated that one of the galleries shall be reserved for thirty-five works by old and modern masters that will be included in his gift.

Free Library for Keighley.—It is understood that in connection with the scheme for widening North Street, Keighley, the Improvement Committee of the Corporation will probably purchase the whole of the North Villas estate, as well as the vacant land to the south of it, and that a proposal to that effect will come before the next meeting of the Town Council. Although not bought ostensibly for the purpose, it is thought that the surplus land may be utilised as a site for the Carnegie Free Library.

New Patents.

The following abridged description is specially drawn up for THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all Patent matters.*

11,013. Door, &c., Knobs.—Patentee: F. H. Collins, of Cumberland Street, Birmingham. Relates to the introduction of a ball bearing between the neck of the knob and the rose of mortice and rim locks and the like. A groove is made in the rose to serve as a race for the balls. A corresponding race is made in the neck of the knob. The balls are inserted by removing the screwed plate.

11,043. Roofing Tiles.—Patentee: A. Leszynski, of Sackheimrechte Strasse, Konigsberg, Prussia. The lower edges are rounded or bevelled to diminish the resistance to wind and prevent lifting of the tiles, and the upper surface of each tile is made concave to facilitate the discharge of rain water when the roof has only a slight fall.

11,094. Paint, Whitewash, &c., Brushes.—Patentees: W. W. Kinniburgh, of Park Terrace, and W. Barr, of Stirling Street; both in Airdrie. Relates to a device for fixing a brush at a variable inclination to the handle. The handle is fixed in a socket carrying a sector, on which pivots a frame, in which the handle of the brush is clamped by screws. The frame can be fixed at any inclination by the screw engaging with the holes or recesses in the sector.

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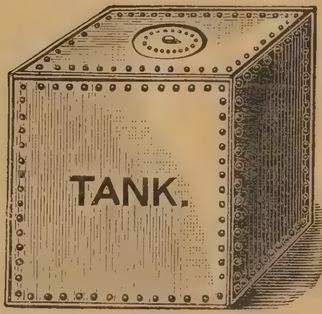

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New Companies.

Kitson Lighting and Heating Syndicate, Limited.

This company was registered on September 15th, by Ingle, Holmes and Sons, 20, Threadneedle Street, E.C., with a capital of £10,000 in £10 shares, to acquire under certain agreements made by this company with A. and E. Kitson and W. Clapham, patent rights relating to improvements in lighting and heating apparatus, and to develop and work the same.

Shoeburyness Brick Company, Limited.

This company was registered on September 19th, by E. F. and H. Landon, 53, New Broad Street, E.C., with a capital of £40,000 in 10,000 cumulative preference shares of £1 each and 30,000 £1 ordinary shares, to acquire, upon the terms of an agreement made by this company with W. Weeks and others, certain freehold and leasehold properties at Great and Little Wakering and Barling, in Essex, and to carry on the general business of brick, tile, and pipe manufacturers. There are to be not less than three nor more than seven directors. Qualification, £500. Remuneration to be fixed by the company.

Societe Generale Des Ciments Portland Sestao, Limited.

This company was registered on September 23rd, by H. B. Brandreth, 9, Jermyn Street, S.W., with a capital of £40,000 in £4 shares, to adopt an agreement made August 31st by Paul Lafarge, for this company, with G. Maurel, and to carry on the business of cement, brick, tile, and pipe manufacturers; to explore, work, manage, and control quarries or properties containing chalk, limes, phosphates, &c.; to carry on all kinds of agency and commission business; to acquire, develop, and work any patents, patent rights, &c. The directors are to be elected by the signatories. Qualification not specified. Remuneration to be according to profits.

Chorlton Land and Building Company, Limited.

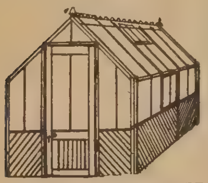
This company was registered on September 15th, by Waterlow Brothers and Layton, Limited, Birchin Lane, E.C., with a capital of £10,000 in £1 shares, to adopt an agreement made by this company with E. Nicolas and J. Beresford, and to carry on the general business of builders and contractors, joiners, plumbers, glaziers, gasfitters, brick and tile makers, financial and general agents, carriers, &c.

J. Whitehead and Co. (Peckham Wharf), Limited.

This company was registered on September 22nd, by Wickes and Champion, 7, Union Court, Old Broad Street, E.C., with a capital of £10,000 in £1 shares, to acquire the business of brick, lime, cement, and timber merchants, as now carried on at Peckham Wharf, Peckham, Surrey, together with all or any of the properties, stock-in-trade, assets, and liabilities thereof, to develop the said business, and to carry on the business of builders and contractors in all its branches; to acquire and turn to account any patents, &c., and as house and estate agents. Registered without articles of association.

Giddings and Dacre, Limited.

This company was registered on September 8th, by Messrs. Crowders and Co., 55, Lincoln's Inn, with a capital of £90,000 in £10 shares (5,000 preference, 4,000 ordinary), to adopt and carry into effect two several agreements, each made between A. Giddings of the one part and this company of the other part, for the acquisition by purchase or otherwise, as a going concern, of the business of engineers, &c., as now and hitherto carried on by Messrs. Giddings and Co., at 19, Chapel Street, Salford, near Manchester, to develop and extend the same, and, generally, to carry on in all or any of their respective branches the businesses of manufacturers of and dealers in chemical lead, sheet lead, lead and composition pipes; as sanitary engineers, manufacturers of and dealers in every description of sanitary ware and appliances, glass embossers, cutters and engravers, glass painters and stainers, lead light makers, lead, glass, brass, iron, copper, and zinc merchants, plumbers and glaziers, builders and contractors, ironmongers, ovenmongers, bar fitters, lock and bolt makers, boiler makers, lacquerers, bronzers, gas engineers and gas fitters, gas meter makers, manufacturers of tanks, cisterns, gasfittings, oils, colours, varnishes, boiler and roofing felts, stoves, grates, and all kinds of heating apparatus, agricultural implements of all kinds, lightning conductors, wire drawers and workers, wheelwrights, indiarubber manufacturers, tin-plate makers and workers, stone and marble masons, picture frame makers, pump makers, electro-platers, gilders, window-blind makers; as chemists and druggists, drysalters, drug grinders; as electrical engineers, producers and suppliers of electricity for the purposes of light, heat, or power; manufacturers of cables, wires, lamps, meters, and other electrical apparatus and appliances; as metal founders, forgemen, iron and steel converters, engine and boiler makers, mechanical engineers, machinists, fitters, metal workers, wire drawers, tube makers, smiths, builders and contractors, or any other business capable of being carried on in connection with the above businesses or any one of them; to develop the resources of land by clearing, draining, planting, farming, or building thereon. The signatories (each one share) are Messrs. A. Giddings, S. Dacre, S. Giddings, F. W. Holmes, J. E. Perkins, L. Giddings, and F. Giddings. The first directors (of whom there shall be not less than three nor more than five) are Messrs. A. Giddings, F. W. Holmes, and J. E. Perkins. Qualification, £2,000. Remuneration, £15 per annum each.



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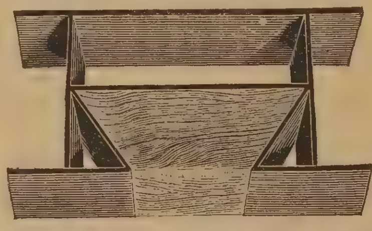

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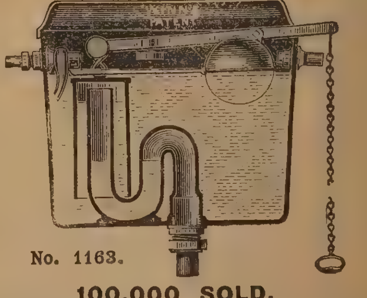

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COMING EVENTS.

Wednesday, October 4.

Sanitary Institute.—(Lectures for Sanitary Officers.)—Mr. Herbert Manley on "Sanitary Law; English, Scotch, and Irish; General Enactments, Public Health Act, 1875; Model By-laws, &c." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting. 8 p.m.

National Association of Master House Painters.—Fifth annual convention at the Shire Hall, Hereford. (Second day.)

Thursday, October 5.

National Association of Master House Painters.—Fifth annual convention at the Shire Hall, Hereford. (Last day.)

King's College, London.—Michaelmas Term opens.

Friday, October 6.

Architectural Association.—Annual general meeting. President's address and distribution of prizes. 7.30 p.m.

Sanitary Institute.—(Lectures for Sanitary Officers.)—Mr. F. J. Waldo on "Public Health Statutes; Orders, Memoranda, and Model By-laws of the Local Government Board, and By-laws in Force in the Administrative County of London." 8 p.m.

Saturday, October 7.

Sanitary Institute.—(Demonstrations for Sanitary Officers.)—Inspection and Demonstration at Wimbledon Sewage Works. 3 p.m.

British Institute of Certified Carpenters.—Meeting at Carpenters' Hall. 6 p.m.

Monday, October 9.

Worshipful Company of Carpenters.—At the Carpenters' Hall, London Wall, E.C. Commencement of evening classes in architectural and constructional drawing, quantities, surveying, &c., and lectures on architectural construction at the University College. Particulars can be obtained from the Secretary at the College, or from Mr. S. W. Preston at Carpenters' Hall.

Wednesday, October 11.

Society of Architects.—Examination in architecture and building construction, &c., at St. James's Hall, Piccadilly, W. (First day).

Thursday, October 12

Society of Architects.—Examination in architecture and building construction, &c., at St. James's Hall, Piccadilly, W. (Second day).

Friday, October 13.

Architectural Association (Discussion Section).—Debate on "The Registration of Architects," opened by Messrs. A. R. Jemmett and G. A. T. Middleton. 7 p.m.

Society of Architects.—Examination in architecture and building construction, &c., at St. James's Hall, Piccadilly, W. (Last day).

Saturday, October 14.

Royal Institute of Public Health.—Last day of Health Exhibition at Blackpool.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 4 0
Sainfoin mixture	do.	3 15 0	4 7 6
Clover, best	do.	3 10 0	5 0 0
Beans	per qr.	1 10 0	—
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 3 4	1 6 10
Colza Oil, English ...	per cwt.	1 4 6	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 9 0	—
Linseed Oil	per cwt.	1 2 2	—
Petroleum, American ...	per gal.	0 0 7	—
Do., Russian ...	per gal.	0 0 5 5/8	—
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 4 0	1 5 0
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 17 9	—
Glue	per cwt.	1 14 0	2 18 0
Lead, white, ground, carbonate	per cwt.	0 19 0	—
Do. red	per cwt.	0 18 1½	—
Soda crystals	per ton	3 10 0	—
Shellac, orange	per cwt.	3 2 0	—
Pumice stone, ...	do.	0 8 9	—

METALS.

Copper, sheet, strong ...	per ton	88 0 0	—
Iron, bar, Staffs. in London	do.	8 10 0	9 0 0
Do. Galvanised Corrugated sheet ...	do.	13 10 0	14 0 0
Lead, pig, Spanish ...	do.	15 12 6	16 0 0
Do. do. English common brands	do.	16 3 9	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	16 10 0	16 12 6
Do. pipe	do.	17 5 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	do.	9 15 0	10 15 0
Tin, Foreign	do.	149 15 0	150 5 0
Do. English ingots ...	do.	153 0 0	154 0 0
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	29 10 0	—
Do. Spelter	do.	22 0 0	22 5 0

TIMBER.

Soft Woods.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Do. Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	do.	4 0 0	6 10 0
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd.	do.	12 10 0	12 15 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	10 10 0	16 0 0
Do. do. 2nd „	do.	10 10 0	12 0 0
Do. do. Unsorted „	do.	8 10 0	10 15 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	10 5 0	16 15 0
Do. White Sea	do.	13 0 0	—
Do. Quebec Pine, 1st...	do.	20 0 0	23 15 0
Do. do. 2nd	do.	13 15 0	15 15 0
Do. do. 3rd &c.	do.	7 15 0	9 15 0
Do. Canadian Spruce, 1st	do.	9 0 0	10 5 0
Do. do. 3rd & 2nd	do.	6 5 0	7 15 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	8 5 0	11 0 0
Flooring Boards, 1 in. prepared, 1st	per square	0 11 3	—
Do. 2nd...	do.	0 10 3	0 11 3
Do 3rd &c.	do.	0 7 9	0 8 0

Hard Woods.

Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4	—
Do. Honduras	do.	0 0 3½	—
Do. Tobasco	do.	0 0 2¼	0 0 3¾
Elm, Quebec	per load	4 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 23/32	—
Do. African ...	do.	0 0 4 1/32—4 15/16	
Do. St. Domingo ...	do.	0 0 5¼	—
Do. Tobasco ...	do.	0 0 3¼	0 0 8¼
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	9 5 0	15 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 2 6	0 4 0

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

BRISTOL.—For the erection of new branch offices, for the Star Life Assurance Society. Mr. A. Blomfield Jackson, architect, 26, Mecklenburgh-square, London:—

E. Walters	£16,535	Stephens and Bastow	£14,749
J. Perkins	16,100	G. Humphreys	14,600
W. Cowlin	15,859	A. J. Beaven*	14,200

* Accepted.

BAKEWELL (Derbyshire).—For the erection of Infirmary, &c, at workhouse, for the Union Guardians. Mr. E. M. Longdon, architect, Town Hall, Bakewell. Quantities by architect:—

Geo. Knowles, Matlock	£6,491
Cox, Wilson and Sons, Ashford, Bakewell* ...	6,167

* Accepted.

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BIRMINGHAM.—For the erection of casual wards at the workhouse, Selly Oak, for the King's Norton Guardians. Messrs. C. Whitwell and Son, architects, 23, Temple-row, Birmingham. Quantities by Mr. T. H. Mansell:—

Hunt Bros.	£6,438	F. Nicholls	£5,712
Fincher and Co.	6,400	Harley and Sons	5,597
Moffat and Sons	6,250	T. W. Halward	5,567
Beach and Co.	6,000	W. S. Seamark	5,555
E. J. Charles	5,991	R. M. Hughes	5,492
Freeman and Sons	5,989	W. Bishop	5,477
Bowen and Sons	5,840	Whitehouse and Sons, Birmingham*	5,469
T. Loud	5,795		
W. H. Gibbs	5,787		

*Accepted.

BRISTOL.—For re-building a factory, Fairfax-street, for Messrs. Pannall and Sons, Limited. Mr. William Paul, architect, Wells-road, Bristol. Quantities by the architect:—

C. A. Hayes	£3,343	Wilkins and Gosling	£2,869
Wm. Church	3,169	R. F. Ridd*	2,825
Cowlin and Son	3,164		

* Accepted.

BURES ST. MARY (Suffolk).—For the erection of a malt kiln. Mr. C. J. Hair, Bugle-street, Southampton, and Mr. G. H. Page, Trinity-chambers, Colchester, joint architects. Quantities by Mr. J. F. Crook, 39, Cambridge-road, Southampton:—

E. West	£1,150	Grimwood and Sons	£1,099
F. Dupont	1,137		

DEVONPORT.—For the erection of five blocks of buildings for artisans' dwellings for the Town Council. Mr. J. F. Burns, Borough Surveyor, 30, Ker-street, Devonport:—

T. King	£11,375 11	Wakeham Bros.	£8,354 0
R. G. Jenkins	8,990 0	Goad and Co.	8,297 0
C. and W. C. Rowell	8,950 0	H. Skinner	8,202 0
T. May	8,628 0	Lethbridge and Son	7,998 0
A. N. Coles	8,500 0	S. Roberts, Plymouth (accepted)	7,094 8

GRAYS.—For alterations for the Capital and Counties Bank, Limited. Mr. Christopher M. Shiner, architect, 3, Bond-court, Walbrook, E.C.:—

Davey Bros.	£1,930	H. R. Rous	£1,750
Potter	1,800	J. Brown	1,655

GREENWICH.—For the erection of offices, &c., for the Directors of the East Greenwich Mutual Benefit Building Society. Mr. Alfred Roberts, architect, 18, Nelson-street, Greenwich, S.E.:—

F. J. Gorham	£1,450	Henry Bridel	£1,280
Hayter and Son	1,375	F. P. Smith	1,274
W. Mills	1,363	E. Mills*	1,191
Jones and Groves	1,339		

* Accepted.

LEICESTER.—For erection of new schools, Narborough-road, Leicester, for the Free Christian Church. Mr. Chas. Kempson, architect. Quantities by the architect:—

Herbert and Son	£1,298	H. Bland	£1,145
Bentley and Co.	1,206	Bradshaw Bros.	1,134
W. Haddon	1,205	W. Jayes	1,099
J. R. Tebbett	1,168	F. Elliott*	1,068
E. J. Rudkin	1,146		

* Accepted.

LEICESTER.—For the erection of a house near Leicester for Mrs. Turner and Miss Pettifor. Mr. Edward Turner, architect, Bank-buildings, Leicester:—

Johnson and Son	£1,308 10 0	J. Pipes	£1,205 0 0
Bentley and Co.	1,225 0 0	F. E. Elliott	1,193 0 0
T. Herbert	1,224 4 6	G. Holt*	1,124 0 0

* Accepted.

LONDON.—For shop front, &c., at the West Ham Brewery, Romford-road, Forest Gate, E., for Mr. R. W. Reeve. Mr. Fred A. Ashton, architect, 177, Romford-road, Stratford, E.:—

I. and H. Cocks	£1,149	A. E. Symes*	£1,125
G. J. Hosking	1,139		

* Accepted subject to modification.

TRURO.—For the construction of cast iron water mains, for the Rural District Council. Mr. R. Hansford Worth, C.E., 42, George-street, Plymouth. Quantities by engineer:—

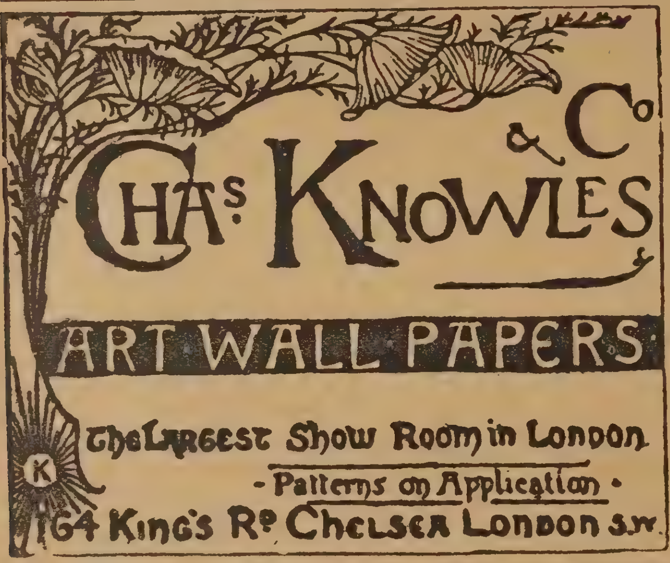
J. Thaddock	£6,923 7 3	R. J. Thomas	£5,831 0 0
E. Duke	6,319 13 0	Hooper Bros. & Roberts, St. Agnes*	5,743 11 10
R. H. B. Neal	6,090 0 0	A. Delbridge	5,700 0 0
H. E. Skinner	6,076 16 3		
Hawking & Best	5,953 5 10		
W. C. Thaddock	5,841 0 0		

* Accepted.

TUNBRIDGE WELLS.—For the erection of first portion of parish room and institute, St. John's. Messrs. H. H. and E. Cronk, architects, Mount Ephraim-road, Tunbridge Wells. Quantities by architects:—

G. Hudson	£3,692	Strange and Sons	£3,113
Turner and Co.	3,449	Crates and Son	2,970
J. Jarvis	3,380	Bowman and Sons, Stamford*	2,900
Padgett and Son	3,293		
Davis and Leaney	3,239		

* Accepted.



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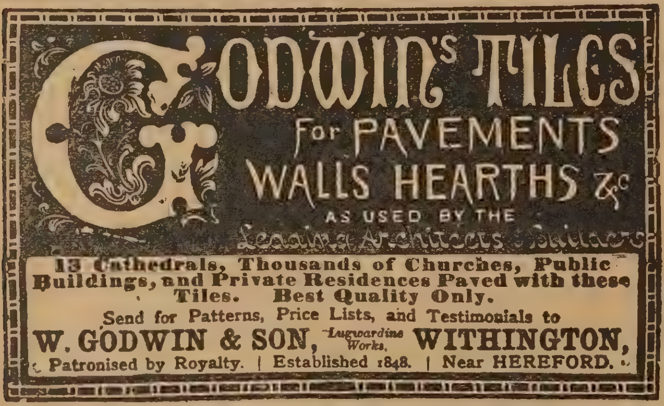

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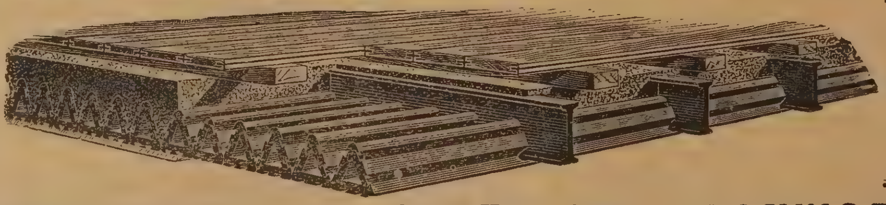

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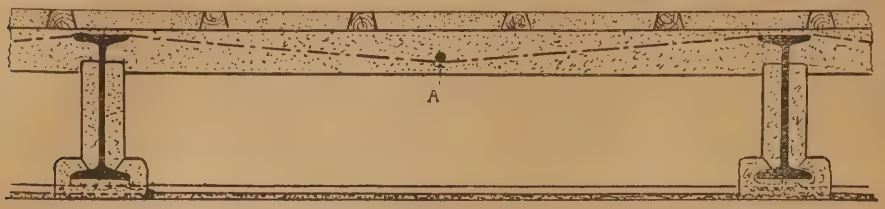

FIG. 1.

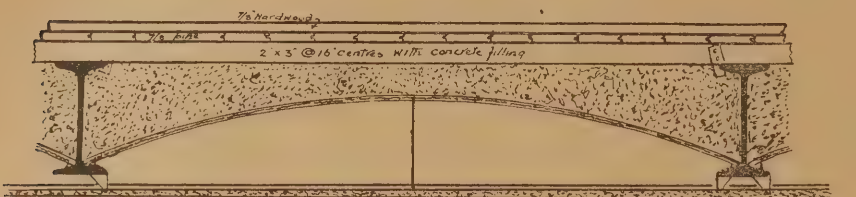

FIG. 2.

FIREPROOF CONSTRUCTION IN AMERICA.—I.

BY J. RAWSON GARDNER, OF MONTREAL.

FIREPROOF construction has become a most important feature in nearly all large modern buildings, and therefore forms a subject for serious study to all those interested in building.

The methods employed to make a structure fireproof are numerous, but they may be classified, as a rule, under two headings:

1. Concrete construction.
2. Hollow tile construction.

In both these forms of construction there are several important conditions to consider and weigh well before deciding on their respective merits. These may be arranged for convenience in the following order, as they apply equally to both forms of construction:

1. The materials used must be fireproof and able to withstand both fire and water simultaneously.
2. The constructional iron or steel must be entirely covered and sufficiently protected.
3. The material covering the steel or iron must not radiate sufficient heat to injure the metal.
4. The weight of the floor.
5. The depth of the floor.
6. The cost.

All these items should be carefully considered before deciding definitely on the relative merits of a system of fireproofing. It will, however, be the purpose of this paper to point out some of the various methods in use on this side of the Atlantic, rather than the pros and cons. of the different systems.

Let us take, then, the four following systems, which will show somewhat the field embraced by concrete construction.

1. Metropolitan system.
2. Roebling system.
3. Expanded metal system.
4. Ransome system.

I. The "Metropolitan" system (formerly called the Manhattan) is erected by the Metropolitan Fireproofing Company of Trenton, New Jersey. The usual floor construction (shown at Fig. 1) is constructed as follows:—A $\frac{3}{4}$in. iron bar (marked A) runs the length of the floor in the centre between the steel beams; under this bar and over the upper flanges of the beams is a network of twisted wires placed $\frac{7}{8}$in. to $1\frac{1}{2}$in. apart, according to span, of two No. 12 galvanised iron wires twisted. Centres are then erected 1in. below the iron bar A, on which a composition or concrete composed of plaster of Paris, 75 per cent.; wood chips, 20 per cent.; and cocoanut fibre and asbestos, 5 per cent., is filled in, after being mixed with water to the consistency of ordinary mortar. This is brought up to a level of $\frac{1}{2}$in. over the beams, so as to protect the wires. The webs of the beams are protected with 2in. slabs of the same material, and the lower flange with a 2in. covering of composition, held in place by $\frac{3}{4}$in. by $\frac{1}{4}$in. flat iron bars, spaced about 16in. centres, which are fastened to the beams by metal clips. If a flat ceiling is required, patented wire lathing is stretched across from beam to beam, and plastered.

II. The Roebling system, as erected by the John A. Roebling Sons Company, of Trenton, New Jersey, is shown at Fig. 2, which gives the usual floor construction erected. The concrete used is what is commonly called "cinder" concrete, composed of one part best Portland cement to two and a half parts of sand and six parts of ashes from steam boilers.

The chief distinctive feature in this system is the $\frac{1}{4}$in. steel rib woven in the wire lathing which forms a centreing for the segmental arch between the steel beams.

The partitions erected by this firm are similar to those built in concrete or plaster by other firms, and are as usual in practice. Fig. 3 shows the construction for a solid plaster partition finishing 2in. thick. The weight is about 20lb. to the square foot.

The studs consist of $\frac{7}{8}$in. channels or 1in. by $\frac{3}{16}$in. flat iron spaced 16in. centres, and securely fastened at floor and ceiling. Across this studding painted wire lathing, stiffened with $\frac{1}{4}$in. steel ribs woven every $7\frac{1}{2}$in., is laced to studs with galvanised wire, the stiffening ribs running crosswise over the studs. All necessary wood furrings are set in position and fastened to studding.

A solid fireproof partition, finished 4in. thick when plastered, is shown at Fig. 4. As the cinder concrete will receive nails, &c., no wood furring is necessary in this form. A similar partition is often erected with the concrete core left out, and a hollow partition thereby made with wood strips or blocks inserted where necessary for nailing wood trimmings. The solid partition weighs about 32lb., and the hollow one about 22lb., per square foot.

III. The expanded metal system is shown at Fig. 5, and is a form of stamped steel lathing stretched over the upper flanges of steel beams, and as is claimed in a pamphlet issued by the makers: "The introduction of metal in the lower part of a concrete plate is strict construction, as concrete and steel have practically the same changes under like thermal conditions. Steel embedded in a non-porous concrete is practically imperishable. The cohesion between steel and concrete is nearly five times the tension of concrete, and the relation of tension to compression in concrete is practically one to ten. Finally, concrete is an excellent material in compression."

It is somewhat on these lines that the next system, the "Ransome," is based.

IV. The "Ransome" system was invented by Ernest L. Ransome, who has studied and worked out the theories of concrete construction (as well as erected work) as much, perhaps, as any man. The method employed by him of embedding a square or twisted steel bar in the tensile area of the concrete beam, instead of the usual rolled steel beam in the other three forms of construction, marks out this system entirely from the others. Mr. Ransome claims that by doing away with the upper section of the steel beam, and by placing the concrete not required in the lower (or tension section) into the upper (or compression) section, you will use both the iron and concrete to the best advantage. The usual floor construction is shown at Fig. 6. Instead, however, of cutting the upper half of the steel beam and leaving a ⊥ in lower half, there is substituted a cold twisted iron bar which is calculated to stand a tensile stress of 10 tons per square inch of sectional area. For the concrete, $\frac{1}{4}$-ton is allowed as the compressive stress; therefore the concrete will be forty times the sectional area of the twisted iron bar. The composition used is made as follows: One part best Portland cement to three parts of aggregate (stone, granite, and gravel). It is very important that the concrete be laid without stopping until the whole thickness of the floor is laid, so that the concrete may be one homogeneous mass. It is claimed that this form of concrete, while giving the best results as to compressive strength, adds considerably to the weight over the cinder concrete, so that the following table may be of interest:

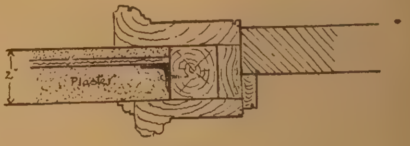

FIG. 3.

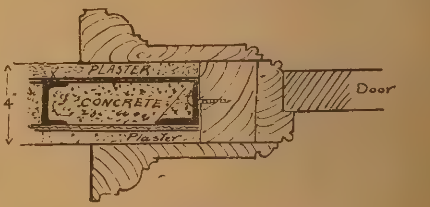

FIG. 4.

Table of Comparative Weight per sq. ft.

Span in feet.	Safe load per sq. ft.	Weight of beam and tile floor.	Weight of Ransome floor.
12	75	35lb.	23lb.
12	125	37lb.	25lb.
16	75	43lb.	27lb.
16	125	46lb.	36lb.
20	75	52lb.	36lb.
20	125	55lb.	44lb.

Which shows about 10lb. per sq. ft. in favour of the concrete "Ransome" system floor.

What can practically be accomplished by this floor construction is shown by the following table, which is taken from a pamphlet issued by the firm of Ransome and Smith Co. The following rule is observed in this table: Thickness of web of concrete beam is three times the section of iron bar, so that with a

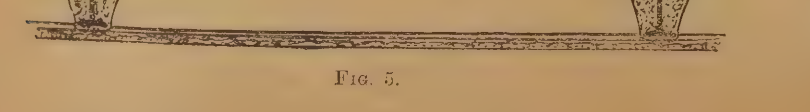

FIG. 5.

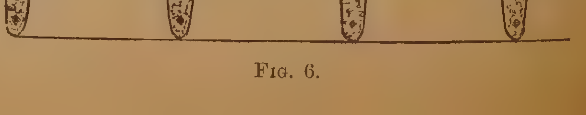

FIG. 6.

twisted bar 1in. square the web of concrete would be 3in. thick.

Safe floor load in lb. per sq. ft.	Approx. weight of floor in lb. per sq. ft.	Size of twisted bars in sq. inches	Thickness in inches of floor plate.	Depth of beam in inches.	
50	18	½in.	1in.	7·5	For 12ft. span.
75	23	¾in.	1¼in.	4·75	
125	25	¾in.	1¼in.	7·5	
250	37	1in.	2in.	8·25	
50	25	¾in.	1¼in.	6·5	For 16ft. span.
75	27	¾in.	1¼in.	9·0	
125	38	1in.	2in.	8·75	
250	46	1in.	2in.	14 5	
50	29	¾in.	1¼in.	10 75	For 20ft. span.
75	33	¾in.	1¼in.	14·75	
125	45	1in.	2in.	13·25	
250	62	1¼in.	3in.	16·	
50	48	1in.	2in.	10·5	For 30ft. span.
75	54	1in.	2in.	22·0	
125	71	1¼in.	3in.	22·5	
250	130	1¾in.	5¼in.	27·0	

"Depth" of beam in the above table means the distance between the upper side of the floor plate and the twisted iron bar. The total depth of floor will, therefore, be twice the size of the iron bar, added to the "depth," this being the rule for the amount of concrete below the bars.

The above notes will give, it is hoped, some idea of the methods employed in the States and Canada for concrete fireproof construction. In a following paper it is purposed to give a few examples explaining some systems of hollow tile construction.

(To be concluded.)

Surveying and Sanitary Notes.

Sewage Scheme at Baildon, Shipley.—The Blaidon District Council propose to carry out extensive sewage works at a cost of £9,060. A Local Government Board inquiry has been held.

Jarrahdale. — The authorities of the Greater Britain Exhibition have awarded a gold medal for jarrah to the Jarrahdale Jarrah Forests and Railways Limited. The firm has just received a supply of 1037 loads.

The Climax Ventilating and Heating Co., Ltd., of 93, Hope Street, Glasgow, have supplied Cousland's improved "Climax" patent natural exhaust ventilators for the accountants' department at the General Post Office, Dublin.

Are Boulders "Rock?"—Mr. Charles Jackson, engineer, Manchester, the arbitrator appointed by the Court of Appeal, has published his award in the action of Braithwaite v. Ilkley District Council. The plaintiffs are contractors carrying on business in Leeds, and sued the Ilkley District Council for work done in connection with the new sewage works at Ben Rhydding. The point in dispute was whether the plaintiffs were entitled to be paid extra for the excavation and removal of blocks of stone or boulders, and also for certain alterations and deviations made in the contract. The defendants contended that though the plaintiffs were entitled to be paid extra for "rock," boulders of the kind described did not come within that term. They also denied that there had been any deviation. The arbitrator has found in favour of the plaintiffs' contention and awards the sum of £616 7s. 7d., defendants to pay all costs.

PUBLIC HEALTH CONGRESS.

FULL particulars of the opening of this congress at Blackpool on September 21st, and of some of the papers read on the two following days, were given in our issue for last week. Excursions and visits were made on Saturday, Sunday, and Monday, but on Tuesday, the 26th, work was resumed. At the conference of sanitary inspectors Dr. Vacher, the president of that section, traced the history of sanitary laws, and, reaching to our own times, enumerated the grievances of those interested in sanitary progress. It was inconceivable, he said, how such a wicked system sprang up as that which made sanitary officials dependent for reappointment at short intervals on the goodwill of the local authority. They had not even what the police possessed—a system of superannuation. Their salaries were inadequate—in many cases not more than £70 a year. There was no provision for technical instruction, and they had no representation on the examination board.

Any prototype of the medical officer of health or sanitary inspector he had failed to find, unless it were in the beadle (or bidder), who seemed to have exercised some functions as a nuisance inspector, to have required the removal of garbage, and to have superintended the lighting of fires after outbreaks of plague and low fever—called bonfires, "for the virtue that a great fire hath to purge the infection of the air." He trusted that the health officer and sanitary inspector was as great an improvement on the beadle of past centuries as the general practitioner was the superior of the apothecary familiar to us in the pages of some old dramatists. He drew a vivid picture of the dreadful state of things in the middle ages—the times of incredible mortality, because people then lived in conditions of great filth, and the physicians ascribed epidemics and endemics to astral and telluric influences, and prescribed for their patients accordingly.

In the Engineering and Building Construction Section Mr. A. H. Tiltman, of London, read a paper on "Public Baths and Washhouses." He confined himself entirely to the changes, generally and in detail, which he considered to be necessary in the distribution, classification, and arrangement of these establishments. M. W. P. Liernur, of Paris, read a paper upon the "Disposal of Sewage," in which he explained the Liernur system of town sewering by evacuation process, adopted in Trouville and other continental towns. A paper on "The Sanitation of Agricultural Buildings" was contributed by Mr. Albert Simpson, J.P., of Garstang. The attention of the authorities, he said, had of late years been given to the sanitation and construction of all classes of buildings, and the condition of our agricultural buildings was found to be very imperfect. His remarks were directed wholly to the important question of ventilation without draughts where cattle were housed, and he submitted a large model of a shippon which provided for a perfect system of ventilation without the slightest draught. The last paper submitted to this section was one by Mr. J. H. Brierley, borough surveyor of Richmond, Surrey, upon "Artisans' Dwellings." Mr. J. A. Priestley read a paper on "The Anomalies of Public Health Law," and contended that the legislature should extend, amend, and consolidate the public health statutes.

At a general meeting of the Congress held in the Grand Theatre (Lord Lorne presiding, and being supported by Sir Matthew White Ridley, the Mayor of Blackpool, and Sir Charles Cameron), the work done during the week by the various sections was put together and given the official stamp of the Institute. The Congress ratified resolutions, calling upon the Government to undertake the control of the smoke nuisance, emphasising the necessity for the efficient examination of sanitary inspectors, expressing the opinion that cremation is the most sanitary method for disposing of the dead, and that crematoria should be erected in populous districts, protesting against the Local Government Board for fixing time limits for the repayments of loans without proper regard for the permanence of the undertakings for which the loans were raised, and calling for the Local Government Board to bring about remedial legislation in regard to the present unsatisfactory state of the law as to sanitary conveniences.

More excursions were indulged in on Wednesday, Sept. 27th, and the Congress broke up on the following day, after doing a week's good work.

Builders' Notes.

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied their patent Manchester grates to the Convent, Norwich.

The New Workhouse Hospital, Sunderland, is being warmed and ventilated by means of Shorland's patent Manchester stoves, some single fronted and some double fronted, with descending smoke flues, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Foreign Cement.—Large quantities of foreign cement are now being imported into the United Kingdom, including some of very poor quality, adulterated with slag. It is often sold to buyers as English cement, and bears the name of "Portland," often without any indication that it is made abroad. Some of the English makers have asked that the authorities should forbid the importation of this foreign cement until the bags bear a title or mark that will enable the consumer to know that the cement is made abroad.

Charge against a Paisley Builder.—At a special meeting of Paisley Dean of Guild Court last Thursday—Bailies Wilson, Galbraith, and Allison on the bench—a petition was presented at the instance of the Procurator-Fiscal against Daniel Gold, builder, with regard to a four-storey tenement at present being erected by him at Underwood Lane, Paisley. The petitioner claimed an interdict penalty and expenses against Mr. Gold, alleging that he had deviated from the lining granted to him by the Dean of Guild Court, in so far as the walls of the building, which were half-way erected, were constructed in an insufficient and untradesmanlike manner, so as to seriously endanger the stability of the building. The petitioner also asked that the walls be directed to be taken down and re-erected to a certain extent. Respondent denied the charges made in the petition, and the case was adjourned till Wednesday next to allow of answers being lodged. It was explained by the Fiscal that interim interdict had been granted against Mr. Gold proceeding with the building. Respondent's agent asked that this interdict be recalled except as regarded the east wall. Mr. Lees, master of works, said he did not think it would be wise to allow Mr. Gold to go on with any part of the building. In fact, he insisted on its being stopped until the whole matter was settled. The interdict was accordingly maintained until the further hearing of the case.

A Big Cumberland Water Scheme, which is estimated to cost £22,000, is now under consideration by the Wigton Rural District Council.

Extension of Gloucester.—The Gloucester City Council have received a report on the extension of the city boundaries in all directions, for which purpose nearly seven thousand acres of country territory would be taken. The rateable value of the town would be increased from £180,000 to £225,000, and seven thousand five hundred persons would be added to the present population of forty-three thousand. The Council instructed the Committee to prepare a further report, with a view to an application being made to the Local Government Board.

Engineering Notes.

At the India Office a complete installation of electric light is being provided.

Emanuel Church, Exeter.—Messrs. John King, engineers, Liverpool, are now fitting their latest hot-water heating apparatus, and patent tubular exhaust ventilators in this church.

Electric Tramways Objected to.—The "Celestial Empire," published in Shanghai, announces that the Yokohama jinrickisha men, numbering 4200, have formed a league to avert the introduction of electric tramways in that port.

A big Tramway Scheme for Leeds.—The Leeds Tramway Committee passed a resolution on September 25th recommending the city council to adopt the overhead electric system for about seventeen miles of streets. The estimated cost is £160,000.

Electric Lighting at Lerwick.—It is proposed to introduce the electric light into Lerwick, and to obtain the necessary power from the surplus water from the Sandy Loch, which at present supplies the town. This surplus water would give 80 h.p. for six hours a day, the gross fall being 220ft. It is recommended that a turbine house should be built at the Loch Clickimin and connected with Sandy Loch by 2000yds. of 16in. pipe. The total cost of the undertaking is estimated at £9260. The present price of gas at Lerwick is 7s. 6d. per 1000ft.

Mr. Edward Case, C.E., whose system of groyning is well-known, has recently died. He first came into prominence in 1890 in connection with Romney Marsh, the sea wall of which was then in a very dangerous condition. Between 1872 and 1890, £90,000 was spent in maintaining the wall, but the efforts were unsuccessful. Mr. Case then came forward with his system and there are now 170 groynes, varying from 350ft. to 1000ft. in length, and extending a total length of ten miles. The effect of this has been to raise the foreshore in some places as much as 8ft., and an average of 4ft. 6in. throughout.

Tramway Extensions at Manchester.—At a meeting of the Manchester Tramways Committee, held on August 26th, it was decided to recommend the council to obtain borrowing powers for the following purposes and amounts: £250,000 for the reconstruction of the permanent way, £150,000 for the overhead equipment, £360,000 for the purchase of 600 cars, £90,000 for certain lands and the erection of a car shed in Queen's Road, and £10,000 for other preliminary expenses. The total amount required up to now is £860,000, and this is but an instalment of the committee's ultimate requirements.

The Leeds Association of Engineers held their first meeting of the winter session last Thursday evening. An address was delivered by the President, Mr. Joe A. Tempests, in which, after alluding to the Association's improved premises, he congratulated members on the prosperous state of the engineering trade. Referring to the increase in the cost of raw materials, he expressed the hope that the demand for the finished product would justify firms in asking such advanced prices as would cover the extra cost of production. The President described the latest engineering industry introduced into the city by Messrs. Greenwood and Batley, Limited, viz., the manufacture of the De Laval steam turbines, turbine dynamos, turbine pumps, turbine fans, &c., for which purpose special works are being erected, having an area of nearly an acre entirely under cover.

Masters and Men.

Engineers at Le Creuzot, France, have struck. The following are their demands:—(1) Recognition of the Union by the Creuzot Administration; (2) suppression of sub-contracting; (3) liberty of conscience; and (4) moderation of the insulting language used by the overseers.

The Scotch Steelmasters' Association met last week in Glasgow, and decided that, considering that the price of pig-iron is at present the same as it was in July last when the men obtained an advance of 10 per cent. on their wages, a further increase was not warranted.

Navvies' Strike in Paris.—A strike has just been been declared among the men working on one of the most important branches of the new Metropolitan Underground Railway in Paris, that of Vincennes. The miners engaged in tunnelling operations made the first move, and the navvies have since thrown in their lot with them. The men ask for pay at the rate of 7½d. per hour, but the contractors only offer 6d., and are, it is stated, determined upon making no concessions.

The Newport Building Trades Dispute has now reached about the sixth month of its existence, having been commenced by the masters locking out the local plasterers in obedience to orders from London as long ago as the end of April. The offer of the masters to give an increase, dating from the 1st inst., has not led to any settlement, although efforts have been made in that direction. The block in the way is one of the rules as to the employment of free labour with union men. Over forty bricklayers and walling masons have left Newport for work in London, Manchester, Bristol, and elsewhere. Less than one hundred men of all ranks of the building trades now remain idle.

Proposed Amalgamation of Woodworkers' Unions.—An effort is being made to secure the fusion of the Amalgamated Society of Carpenters and Joiners' with the Alliance Cabinetmakers. The necessity of this course being adopted is shown by the fact that in many instances the work of cabinetmakers overlaps that of carpenters. Men of one class have been in the habit of accepting jobs at lower rates than their brethren in the other society. The Alliance Cabinetmakers have long been anxious to amalgamate, but hitherto difficulties have arisen which have proved to be insurmountable. A ballot is now being taken on the question, and it is hoped that the result will be made known next month. There are now four carpenters' societies, each overlapping the other in some way or other.

A Building Trades Conciliation Board has now been established. It will consist of fifteen members of the National Association of Master Builders of Great Britain and Ireland, and fifteen representatives of the Amalgamated Society of Carpenters and Joiners, the General Union of Carpenters and Joiners, the Associated Joiners of Scotland, the London Order of Bricklayers, the Manchester Unity of Bricklayers, the Operative Stonemasons' Society, the Operative Plumbers' Society, the National Society of Ship and House Painters, the Amalgamated Society of House Painters, the Amalgamated Society of Mill Sawyers and Wood-cutting Machinists, the United Builders' Labourers' Union, the Gasworkers' and General Labourers' Union, and the United Order of General Labourers. In addition to the representatives from employers and workmen, there are also to be district committees, the numbers to be decided locally. Disputes are at present in progress among joiners and carpenters at Hull, Halifax, Newport (Mon.), Londonderry, Oswestry, and Fleetwood.

The State of the Building Trade Dispute at Bristol has not changed since the men came out last Saturday week. Mr. Davis, secretary of the local branch of the Plasterers' Society, has made a statement concerning the position of the men. He states that when the lock-out occurred in March last, the men received a formal notice from the Master Builders' Association of Bristol, and they considered the whole of their working rules were broken. When the lock-out ceased on June 17th, he wrote to the masters on the 19th of the same month asking them to arrange a conference at the earliest possible date. Instead of granting that, the masters kept them about until the 6th of July. The plasterers had arranged to have a meeting, but that had to be put off, and at the last moment a notice came from the masters to the effect that they could not attend. When the men met them on 13th July they submitted a code of working rules, and asked for compensation, stating that they required a lump sum or a halfpenny per hour advance. The masters asked for a fortnight to consider the matter. This was granted, but it is said that no reply was received until August 25th, when the men received a notice practically declining to meet them, or to discuss the question. The men then gave them eleven clear days' notice. Eight days elapsed before they arranged to meet them at all, so that there was no alternative but for the men to give them the two hours' notice. Mr. Davis further stated that more than half the men were at work for non-federated firms, who had agreed to pay the men what they required, and that they hoped shortly to send away sixty men out of Bristol for employment elsewhere. On the part of the masters, it is asserted that the two hours' notice does not apply to a strike, but merely to the termination of employment in the ordinary course. The course the men should have followed is said to be defined in the fifth of the rules drawn up between the master builders and operative plasterers in May last. This rule reads as follows:—"In the event of a dispute arising on any job or works, the district officials of the N.A.O.P. shall send written notice to the local Association of Master Builders, who shall inform them whether the said builder is a member of that body. If so, a strike shall not be sanctioned by the N.A.O P. until six clear working days have expired from the receipt of such notice, during which time the matter shall be considered by the employers and the representatives of the workmen, with a view to an amicable settlement. Failing a local settlement, reference shall immediately be made to a central joint committee of the two associations, and until five days have expired from the date of this reference, no strike or lock-out shall be sanctioned either by the N.A.O.P. or by the National Association of Master Builders." With regard to the alleged refusal of members of the N.A.O.P. to work with workmen who may not belong to a trade union, it is understood that the men the operative plasterers object to work with are defaulters and other men who have been shown to the employers to have made themselves specially objectionable to the union men.

Hull Building Trade Dispute—Another attempt is to be made to settle this dispute, which has now been continued for over thirty weeks. Last Wednesday a conference was held between the Hull Master Builders' Executive and representatives from the respective operative societies, under the presidency of Mr. W. G. Bray. The employers submitted the following new proposals for a settlement:—

1. That all men return to work on the old rules. 2. That a joint board of conciliation be formed, consisting of an equal number of employers and employed, and that any difficulties, both present and future, shall be dealt with by such board prior to any stoppage of work. The board to be called together within forty-eight hours of any dispute occurring. It was mutually agreed that the proposed terms of settlement be forthwith brought before the members of each interested association, and a vote (for or against) taken. There is good reason to believe that these terms

will be accepted by the men, and a speedy termination of the unfortunate dispute will take place. The proposals now put forward by the masters that the men shall return to work on the old terms is practically a concession of the principle that the men have been fighting for. With the exception of the joiners, who asked for an extra halfpenny per hour, which the masters on several occasions have expressed their willingness to grant, the dispute has all along had its foundation in the proposed revision of rules, the principal one of which was that unionists should agree to work amicably with non-unionists. There were other points as to starting places and walking delegates, which were, however, of minor importance compared with the other proposal, which the men, who embrace all branches of the building trade, have successfully resisted. The continuance of the dispute has only rested with the local Master Builders' Association for some six or seven weeks past, since the Yorkshire Federation decided to withdraw their lock-out notices, this action of the federation causing the dispute to be localised. Hull being left to fight its own battle. It has been arranged that the ballot of the joiners on the new proposals shall be taken to-morrow, and of the bricklayers to-day, at the St. George's Hall, Hull. The struggle has cost the joiners about £1,500 and the bricklayers between £2,000 and £3,000, whilst many works, both public and private, have been stopped.

Trade and Craft.

WELSBACH GAS FITTINGS.

The Welsbach Incandescent Gas Light Co. ave last week at their showrooms, York treet, Westminster, an exhibition of their ew goods for the coming season. There was most bewildering collection of all manner of lain and ornamental brackets and chandeliers uitable for all classes of houses. Perhaps he most noticeable amongst them was the ew "Surprise Pendant," which can be moved any direction, and which when fitted with n ornamental silk shade has a charming soft fect. These pendants have recently been troduced by the Prince of Wales into andringham House. There was also on xhibition an ingenious arrangement known the Automatic Gas Lighter, which dispenses tirely with the use of matches and tapers r lighting, and is therefore most invaluable minimising the risk of fire. It can be fitted any of the Welsbach burners, and by its e the gas can be switched off and on conveniently as electric light. Its use o allows the Welsbach burners to be hted without explosion, and so increases the life of the mantle. Another novelty was the Anti-Vibrator Burner, which has been adopted for use where there is a heavy traffic. By the fixing of a spring inside the burner no amount of vibration affects the mantle. Hitherto the Welsbach fittings have been used almost entirely for gas, but they have now been adapted to oil lamps, and in the "Era" lamp a most brilliant effect is obtained. It is claimed for this lamp that a light of fifty candles can be obtained while consuming only one-third of the amount of oil of an ordinary lamp giving the same light, besides throwing off less heat. We are informed that the goods of this company are coming more and more into general use, and each season shows an increased demand.

FIREPROOFING AND SOUND-PROOFING.

Of late years a very healthy interest has been shown in all methods of fire prevention in buildings and in appliances for the protection of life. The rapid decline in the partiality for concrete systems has induced Messrs. Frederick Jones and Co., the Silicate Cotton and Plaster Slab Works, Perrin Street, Kentish Town, N.W., to place before the architectural world a few facts concerning their patent British-made silicate cotton. These facts are contained in an interesting little pamphlet entitled "Fire-Proofing and Sound-Proofing," which says that silicate cotton, or "slag wool," is a pure mineral fibre, blown from slag or other vitreous substance of a similar nature. The work enumerates the principal virtues of silicate cotton, which is one of the finest non-conductors of heat, cold, and sound. It is perfectly sanitary, as it does not contain anything which will assist in generating or harbouring vermin. The fireproof qualities of this material are well known. In conjunction with plaster it forms an excellent protective jacketing for iron girders, &c., and for rendering ceilings fireproof. Messrs. Jones, who, besides their works in London, have depots at Manchester, Leeds, Middlesbrough, Newcastle-on-Tyne, Glasgow, and Swansea, will be glad to furnish samples of, and further particulars concerning their patent silicate cotton upon application.

ARMOURED FIREPROOF DOORS.

Until 1895 the Associated Fire Insurance Offices of the United Kingdom, and even the various Building Acts stipulated that all fireproof doors must be constructed of wrought iron; but experience proved that such doors were only partially suited for fire-resisting purposes, as, when under a fire test, owing to unequal expansion, they invariably "buckled," and sometimes tore themselves away from their hangings, thus allowing the fire to get through the door openings, and not preventing its spread. By a circular dated April, 1895, however, the British Fire Offices officially recognised armoured timber fireproof doors, and practically stipulated that in cases where a fireproof door is to slide from side to side, it must be of this construction, and not of iron at all. The idea of constructing fireproof doors of timber originated in America, and Messrs. Dowson, Taylor and Co., the proprietors of the Grinnell Automatic Sprinkler, are the manufacturers in this country of the patent self-closing armoured fireproof doors. These doors are constructed of two, three, or four thicknesses (according to the area of the opening) of well-seasoned pine boards, planed, tongued and grooved, and nailed together with wrought iron nails, driven flush, and clenched on the other side. They are completely covered with tinned steel sheets, put on in such a manner that whilst free to expand they exclude the air and cannot become detached. By excluding the atmosphere from the wood, combustion is prevented, and an exposure of several hours to the flames only results in the timber becoming carbonised to the depth of a fraction of an inch; in fact, at a fire at the works of the Anaglypta Company, Limited, at Darwen, although the iron girders forming the roof were bent and twisted into all manner of shapes, and the roof fell in, an examination of an armoured door which had been manufactured by Messrs. Dowson, Taylor and Co. showed that the wood had been simply charred to a depth of about one-eighth of an inch. In several other instances have the armoured doors of this firm effectually excluded the flames. The armoured doors are less than half the weight of iron ones, and when fitted with the frictionless pulley hangers, supplied by the firm, they run along the rails with the greatest freedom. Sliding, hinged, or folding doors are supplied, if required, fitted with the patent automatic apparatus for self-closing in case of fire. The London address of the firm is 14, Victoria Street, S.W. They also have offices in Manchester, Leeds, Glasgow, and Birmingham.

A Bust of François Chabas, the eminent Egyptologist, has been erected in the new public gardens at Chalsu-sur-Saône on an obelisk appropriately decorated with hieroglyphics and a crouching sphinx. Curious to relate, this great Egyptologist never went to Egypt, his only excursion abroad being that to some Italian museums in 1869.

The Proposed Purchase of Dollis Hill.—Colonel A. C. Smith, Local Goverment Board Inspector, has held an inquiry into the application made by the Willesden Council, London, N.W., for sanction to borrow £50,000 for the purchase of the Dollis Hill Estate, which it is proposed to utilise as public parks and pleasure grounds.

COMPLETE LIST OF CONTRACTS OPEN.

ATE OF LIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—		
t. 6	Dublin—Addition to National Gallery of Ireland ...	....	H. Williams, Office of Public Works, Custom House, Dublin
6	Ynysybwl, Wales.—Classroom	Llanwonno School Board	A. O. Evans, Architect, Pontypridd.
6	Worksop—Alterations to Station	Great Central Railway Co.	Engineer, London-road Station, Manchester.
6	Thornton—House for Station Master	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
6	Birmingham—Goods Offices	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
6	Scotby—Six Stone Huts for Platelayers	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
6	Leixlip, Ireland—Four Cottages	Celbridge Rural District Council ...	L. A. McDonnell, 33, Kildare-street, Dublin.
7	Dewsbury—Bathrooms, Lavatories, &c., at Hospital ...	Corporation	Borough Surveyor, Town Hall, Dewsbury.
7	Hatfield, Herts—Bridge Widening	County Council	U. A. Smith, 41, Parliament-street, Westminster, S.W.
7	Sale—Entrance Lodge, &c., at Recreation Ground ...	Urban District Council	A. G. M'Blath, 2, Montagu-road, Sale.
7	Stainland, Yorks.—Three Houses	....	C. F. L. Hoosfall and Sons, Architects, Lord-street-chambers, Halifax.
7	Cardiff—Branch Library	Corporation	Feather and Wilson, Andrews-bldgs., Queen's-st., Cardiff.
7	Whitchurch, Devon—Repairs to Vicarage and Glebe ...	....	Vicar, Whitchurch, Devon.
7	Horsham—Additions and Alterations	....	C. H. Burstow, 6, West-street. Horsham.
9	Burnley—Extension of Workhouse	Union Guardians	S. Keighley, Architect, Nicholas-street, Burnley.
9	Crook, Durham—Minister's Residence	Primitive Methodist Society	F. H. Livesay, Architect, North-Eastern Bank-chambers, Bishop Auckland.
9	Pentre, Wales—Alterations, &c., to School	Ystradyfodwg School Board	J. Rees, Architect, Hillside Cottage, Pentre.
9	Yardsley—Public Offices, Fire Station, &c.	Rural District Council	A. Harrison, Queen's-chbrs., 88, Colmore-row, Birmingham.
10	Barking, Essex—Greenhouse	Urban District Council	C. J. Dawson, Council's Surveyor, Public Office, Barking.
10	Brighton—Engine and Boiler Houses, Chimney Shaft &c	Corporation	F. J. Tillstone, Town Clerk, Town Hall, Brighton.
10	Birkenhead—Electricity Generating Station	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
10	London, W.—Post Office Savings Bank	Commissioners of H.M. Works	H. Tanner, Office of Works, Storey's Gate, S.W.
10	Dublin—Bridewell and Offices	....	H. Williams, Secretary, Office of Public Works, Dublin.
10	Ystrad, Rhondda, Wales—Hospital Blocks	Rhondda Urban District Council ...	W. D. Morgan, 23, St. Mary-street, Cardiff.
11	Ashton-in-Makerfield—Alterations, &c., to Council Offices	Urban District Council	J. W. Liversedge, Surveyor, Offices, Ashton-in-Makerfield.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Oct. 11	Bishop Sutton—Infant School	....	M. Froud, 1, St. Stephen's-street, Bristol.
,, 11	Devonport—Parochial Offices	Guardians of the Poor	H. G. Luff, 64, Chapel-street, Devonport.
,, 11	Elland, Yorks.—Engine Room, Boiler House, &c.	....	W. C. Williams, 29, Southgate, Halifax.
,, 11	Tooting, S.W.—Asylum	Metropolitan Asylums Board	A. and C. Harston, 15, Leadenhall-street, E.C.
,, 11	Hackney, N.E. Alterations, &c., to Public Baths	Vestry	Gordon, Lowther&Gunton,Finsbury-ho.,Bloomfield-st.,E.C.
,, 11	London—Works, Repairs, and Materials	War Department	Royal Engineer Office, 41, Charing Cross, S.W.
,, 12	Wolverhampton—Workhouse Infirmary	Union Guardians	A. Marshall, Architect, King-street, Nottingham.
,, 12	South Normanton—Girls' School	School Board	R. C. and E. R. Sutton, Architects, Bromley House, Angel-row, Nottingham.
,, 12	Ilford—Erection of School	School Board	C. J. Dawson, 7, Bank-buildings, Ilford.
,, 13	Skerton, Lancaster—Church	....	Rev. P. O'Bryen, Slyne-road, Skerton, Lancaster.
,, 13	Leicester—Cemetery Buildings, &c.	Corporation	Goddard and Co., 6, Market-street, Leicester.
,, 14	Bootham, York—School Blocks	....	W. H. Thorpe, 61, Albion-street, Leeds.
,, 14	Winchcombe—Police Station	Gloucester Standing Joint Committee	M. H. Medland, 15, Clarence-street, Gloucester.
,, 14	Watford—School	School Board	W. H. Syme, 4, High-street, Watford, Herts.
,, 16	Wimbledon—Ten Workmen's Dwellings	Urban District Council	C. H. Cooper, Surveyor to Council, The Broadway, Wimbledon.
,, 16	Barking—School Classrooms	School Board	C. J. Dawson, Architect, East-street, Barking.
,, 16	Kingwood Hill, near Bristol—Engine House and Foundations.	West Gloucestershire Water Co.	E. D. Marten, Engineer, The Birches, Codsall, Wolverhampton.
,, 17	London, S.E.—Alterations, &c., to Workhouse	St. Olave's Union Guardians	Newman and Newman, 31, Tooley-street, E.C.
,, 18	Isleworth—Workhouse	Brentford Union Guardians	W. Stephens, Clerk, Union Offices, Isleworth, W.
,, 18	Isleworth—Mortuary at Infirmary	Brentford Union Guardians	W. H. Ward, Architect, Paradise-street, Birmingham.
,, 24	Romford—Isolation Wards at Hospital	Joint Hospital Board	— Whitmore, 17, Duke-street, Chelmsford.
,, 25	Swansea—Extension of Workhouse	Union Guardians	G. B. Haynes, 8, Fisher-street, Swansea.
Nov. 7	London, W.—Female Staff Home, &c., &c., at Infirmary	St. George's Union Guardians	E. T. Hall, 57, Moorgate-street, E.C.
	ENGINEERING—		
Oct. 6	Celbridge—Pump Well, &c.	Rural District Council	L. A. Macdonnel, Architect, Council Offices, Celbridge.
,, 6	Blackpool—Extension of Jetty	Pier Company	J. Walker, Secy., Old Bank-chmbrs., Talbot-sq., Blackpool.
,, 6	West Bridgford, Notts.—Septic Tank	Urban District Council	W. Pare, George-road, West Bridgford.
,, 7	Cork—Sinking Wells and Erection of Pumps	District Council	J. Cotter, Clerk, Board Room, Workhouse, Cork.
,, 7	Bridgwater—Waterworks	Rural District Council	W. J. Press, Engineer, Town Hall, Burnham, Somerset.
,, 7	Whitehaven—Dredging Sand, &c.	Harbour Commissioners	E. E. Stiven, Harbour Engineer, Queen's Dock Quay, Whitehaven.
,, 9	Tynemouth—Reservoir	Corporation	J. Mansergh, 5, Victoria-street, Westminster.
,, 9	Rotherham—Electric Lighting	Corporation	H. H. Hickmott, Town Clerk, Rotherham.
,, 9	Swansea—Electrical Plant	Corporation	Kincaid, Waller, and Manville, 29, Great George-street, Westminster, S.W.
,, 9	Aberavon—Esplanade	Earl of Jersey	T. Williams, Estate Office, Briton Ferry.
,, 9	Birkenhead—Salt Water Storage Tanks and Filter	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
,, 10	Glasgow—Switchboards, Travelling Cranes, &c.	Corporation	J. Young, 88, Renfield-street, Glasgow.
,, 10	Wapping—Alterations to Swing Bridge	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
,, 10	Londonderry—Waterworks	Council	J. J. S. Barnhill, 1A, Strand, Londonderry.
,, 10	London, S.W.—Alteration of Bridge Swinging Gear	London County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
,, 10	Londonderry—Extension of Waterworks	Council	J. J. S. Barnhill, 1a, Strand, Londonderry.
,, 10	Glasgow—Reconstruction of Tramways	Corporation	J. Young, 88, Renfield-street, Glasgow.
,, 11	Warminster—Pipelaying	Urban District Council	A. F. Long, Town Engineer, Warminster.
,, 11	Manchester—Passenger Elevator	Improvement Committee	City Surveyor, Town Hall, Manchester.
,, 12	London, S E.—Hot Water Supply and Pumps at Baths	Lambeth Vestry	J. Buley, 5, Lawrence Pountney Hill, E.C.
,, 14	Tiflis—Tramways Concession	Town Council	Managing Department of Council, Tiflis, Transcaucasus.
,, 14	Milford, Ireland—Sinking Well and Erecting Pump	Rural District Council	S. Walters, Clerk, Council Offices, Milford.
,, 14	Warrington—Steam Engines at Waterworks	Corporation	J. Deas, Engineer, Bank House, Warrington.
,, 16	Great Farrington—Waterworks	Corporation	B. Latham, 13, Victoria-street, Westminster.
,, 18	Leeds—50 Electric Tramcars	City Council	T. Hewson, City Engineer, Municipal Buildings, Leeds.
,, 18	Purton, Wilts—Waterwoks	Rural District Council	F. Redman, Engineer, Newport-street, Swindon.
,, 24	Barking, Essex—Light Railway Plant	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
,, 30	Port Elizabeth—Railway	....	General Manager of Railways, Capetown.
Nov. 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
Jan. 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
	IRON AND STEEL—		
Oct. 7	Edinburgh—Cast-iron Main Pipes	Gas Commissioners	W. R. Herring, 25, Waterlow-place, Edinburgh.
,, 7	Bridgwater—Water Main	Rural District Council	W. J. Press, Engineer, Town Hall, Burnham, Somerset.
,, 9	Manchester—Railway Stores	Lancashire and Yorkshire Railway Co.	Stores Department, Osborne-street, Manchester.
,, 9	Belfast—Stores	Harbour Commissioners	G. F. L. Giles, Harbour Engineer, Harbour Office, Belfast.
,, 10	Birkenhead—Rails, Fishplates, &c.	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
,, 11	Warminster—Pipes	Urban District Council	A. F. Long, Town Engineer, Warminster.
,, 11	Walthamstow—Wrought Iron Principles, &c.	Urban District Council	Works' Manager, Site of Electric Lighting Station, Priory-avenue, Hoe-street Station, Walthamstow.
,, 18	Christiania, Norway—Steel Rails and Fishplates	State Railways Administration	Commercial Department, Foreign Office, S.W.
	PAINTING AND PLUMBING—		
Oct. 7	Totnes, Devon—Painting Work at Workhouse	Guardians	W. F. Tollit, Surveyor, Gate House, Totnes.
,, 7	Ballinasloe, Ireland—Plumbing, Gasfitting, &c.	Committee of District Asylum	J. Young, Clerk of Asylum, Ballinasloe.
,, 9	London, S.E.—Cleaning and Painting Water Tank	St. Leonard's Guardians, Shoreditch	R. Clay, Clerk, 213, Kingsland-road, N.E.
	ROADS AND CARTAGE—		
Oct. 6	London, S.W.—Laying out Estate	....	W. N. Dunns, 1, Bucklersbury, E.C.
,, 9	Croydon—Road Repair	Corporation	Borough Road Surveyor, Town Hall, Croydon.
,, 10	Cleethorpes, Grimsby—Road Works	Urban District Council	E. Rushton, Surveyor, Poplar-road, Cleethorpes.
,, 11	Fulham, S.W.—Making-up and Paving Streets	Vestry	C. Botterill, Town Hall, Walham Green, S.W.
,, 18	Balby-with-Hexthorpe, Yorks.—Forming, &c., Streets	Urban District Council	G. Gledhill, Surveyor, High-road, Balby.
,, 23	Little Hulton, Lancs.—Road Improvement Works	Urban District Council	C. C. Hooley, 34, Brazenose-street, Manchester.
	SANITARY—		
Oct. 9	Jarrow—Building Manholes	Sanitary Authorities	Borough Surveyor, Grange-road, Jarrow.
,, 9	St. Marychurch, Devon—Sewers	Urban District Council	R. H. Worth, 42, George-street, Plymouth.
,, 9	Leatherhead—Sewerage Works	Urban District Council	F. Beesley, 11, Victoria-street, Westminster.
,, 9	Hendon, N.W.—Bacteria Bed, Portland Cement, &c.	Urban District Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
,, 10	Rawtenstall—Scavenging	Corporation	Sanitary Inspector, Municipal Offices, Rawtenstall.
,, 11	Warminster—Laying Sewers	Urban District Council	A. F. Long, Town Engineer, Warminster.
,, 11	Greenwich, S E.—Making Entries into Sewers, &c.	District Board of Works	J. Spencer, Clerk, 141, Greenwich-road, Greenwich, S.E.
,, 12	Whiston, Prescot—Lancs.—Pipe Sewers	Rural District Council	J. T. Wood, 3, Cook-street, Liverpool.
Nov. 10	Darton, Yorks.—Sewerage Works	Urban District Council	W. H. Radford, Pelham-chambers, Angel-row, Nottingham.
No date.	Dartford, Kent—Laying Main Sewer	....	C. E. Vaughan, 11, Adam-street, Strand, W.C.
	TIMBER—		
Oct. 7	Spezia—Firwood, &c.	General Direction of Arsenal	Commercial Department, Foreign Office, S.W.
,, 23	London, E.C.—Telegraph Poles	Post-Master General	C. E. Stuart, Controller of Stores, General Post Office, London.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct. 16	Paignton, Devon—Pavilion on Recreation Ground	£15, £5	G. Barnston, Clerk to U.D.C., Town Hall, Paignton.
,, 17	Blackpool—School for 1000 Children	....	T. Loftos, Clerk to School Board, Town Hall, Blackpool.
,, 28	Elland—Baths	2nd Premium £20, 3rd Premium £10	Clerk to Urban District Council, Offices, Elland.
Nov. 30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *vid* New York.

Property and Land Sales.

FREEHOLD BUILDING ESTATE, fronting on main road and close to golf links and Highgate Woods, seven minutes' walk from Muswell Hill and East Finchley stations. To be LET on lease or SOLD n plots. Liberal advances to responsible builders if equired. For plans and particulars, apply to Mr. George H. Paine, Architect and Surveyor, 6, Stoke Newington-road, N. 3

TO BUILDERS AND OTHERS.—LOXFORD HALL ESTATE, ILFORD.—In a very important position, within easy reach of Ilford and Barking Stations, with their unrivalled rail facilities to the City, and in close proximity to the Ilford and Barking public parks, 50 Plots of thoroughly eligible FREEHOLD BUILDING LAND, having important frontages to Ilford-lane, Hampton, Henley, and Mortlake roads, with good depths, and absolutely ripe for the immediate erection of shops and villa residences, for which the demand at Ilford is so increasingly keen. Free conveyances. Payment by instalments.

MESSRS. KEMSLEY will SELL the above by AUCTION at the Angel Hotel, Ilford, on WEDNESDAY EVENING, OCTOBER 4th, at SEVEN 'clock precisely.

Particulars of Messrs. Paterson, Sons, and Candler, olicitors, 26, Bouverie-street, E.C.; and of the Auc-ioneers, 41, Bishopsgate-street-within, E.C., and at Woodford Green and Romford. 1

nique Sites for Docks and Shipbuilding, extending from Chepstow Station to River Wye.

MESSRS. DRIVER, JONAS, and CO. beg to announce that they are honoured with in-tructions from his Grace the Duke of Beaufort to ELL by AUCTION, at the Beaufort Arms Hotel, hepstow, on THURSDAY, OCTOBER 5th, at 10.30 .m., in One Lot, 40 acres of valuable FREEHOLD AND, similarly situate to the Llanarth Docks, New-ort, Mon., having a frontage of about half-a-mile to e River Wye, and forming the entire block between e river and the Great Western Railway. The hepstow Station is on the property, which has direct cess from the town by the Station-road, and is espe-ally suited for new docks, shipbuilding yards, engi-eering modern manufactures, or other large industrial nterprise, for using the tidal power, here the second ghest in the world, the exceptionally favourable rcumstances of which are seldom found in large orts. It includes the Chepstow Cattle Market, bonded rd, landing stage, and rich meadows, all let, at £140.

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Date, 1899.	Lecturer.	Subject and Synopsis.
Thursday, Oct. 12th	Professor T. ROGER SMITH, F.R.I.B.A.	**Site, Foundations, and Sanitary Requirements.** What is needed to make a Building a healthy one. Sanitary precautions as to Healthiness of Site and the sufficiency of Air Space about Buildings, Light, &c. Construction of Foundations, especially when the bottom is bad or under water.
Thursday, Oct. 19th	Professor HENRY ROBINSON, M. Inst. C.E.	Sanitary Arrangements of Buildings, the construction of Water Closets, Privies, and Dry Closets, Water Supply, Water Tanks and Services, and Plumbers' Work. The Essentials and Details of Good Drainage; the various kinds of Pipes, Pipe Laying; Ventilation of Drains and Testing of Drains; Dealing with old Drains.
Thursday, Oct. 26th	THOMAS BLASHILL, Esq., F.R.I.B.A.	**Sanitary Construction, Warming, and Ventilation.** The Properties and Qualities of Building Materials and modes of using them. Timber: its decay and preservation.
Thursday, Nov. 2nd	KEITH D. YOUNG, Esq., F.R.I.B.A.	Principles of Ventilating and Warming Buildings.
Thursday, Nov. 16th	JAMES BARTLETT, Esq., M.S.A., Demonstrator, King's College.	**Setting Out Work and Bye-Laws.** Principles of Calculating Areas, Cubic space; Interpretation of Drawings to Scale; Methods of Setting out Work, Checking Levels. Knowledge of the Acts of Parliament relating to Buildings. The Model Bye-laws issued by the Local Government Board, so far as they relate to the subjects of the Examination.

These Lectures are primarily intended for Candidates for the present or future Examinations, and are Illustrated by Take-to-pieces Models, large Diagrams, Photographs, and Specimens of Materials.

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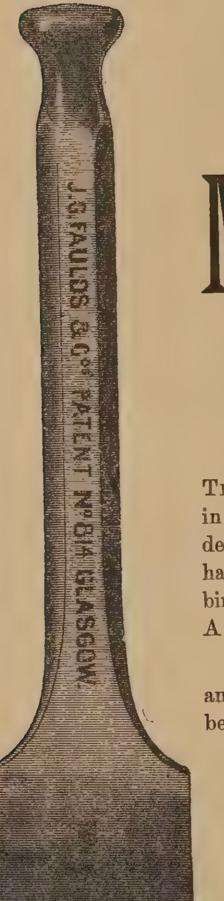
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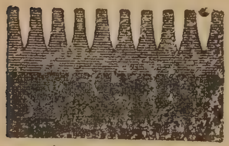

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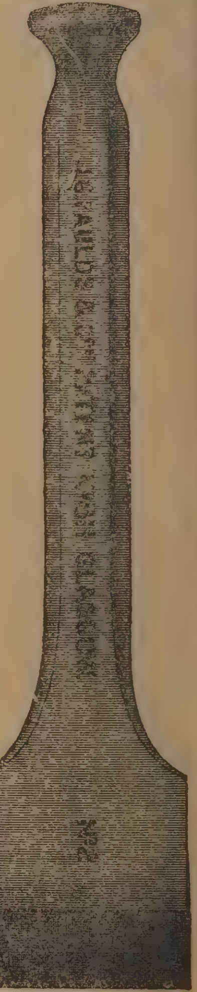
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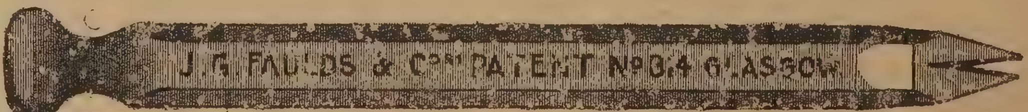
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Continuation of **Specification.** *Joiner.*

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Per foot super.	2½in. framed, ledged, and braced door, covered with 1in ploughed and tongued and V-jointed both sides match boarding	0	11	0	2	10
Each.	Cutting ends of ledges and letting into frame ...	0	3	0	0	3

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Per foot super.	1in. square framed, one panel door	0	5½	0	0	11½
Per foot super.	1in. bead butt, or moulded and square, one panel door	0	5¾	0	1	1
Per foot super.	1in. bead flush and square, one panel door	0	6	0	1	1
Per foot super.	1in. bead butt and moulded, one panel door	0	6	0	1	2
Per foot super.	1in. square framed, two panel door	0	6	0	1	1
Per foot super.	1in. bead butt, or moulded and square, two panel door	0	6½	0	1	1½
Per foot super.	1in. bead flush and square, two panel door	0	7	0	1	1½
Per foot super.	1in. bead, butt and moulded, two panel door	0	7	0	1	2½
Per foot super.	1¼in. square framed, one panel door	0	5	0	1	2
Per foot super.	1¼in. bead butt or moulded and square, one panel door	0	5½	0	1	3
Per foot super.	1¼in. bead flush and square, one panel door	0	6	0	1	3
Per foot super.	1¼in. bead butt and moulded, one panel door	0	6	0	1	4
Per foot super.	1¼in. stop chamfered and square, one panel door ...	0	5	0	1	3
Per foot super.	1¼in. square framed, two panel door	0	6	0	1	3
Per foot super.	1¼in. bead butt or moulded square, two panel door ...	0	6½	0	1	4
Per foot super.	1¼in. bead flush or square, two panel door	0	7	0	1	4
Per foot super.	1¼in. bead butt and moulded, two panel door	0	7	0	1	5
Per foot super.	1¼in. stop chamfered and square	0	6	0	1	4
Per foot super.	Any of above, with bolection mouldings, extra ...	0	0	0	0	2

TWO PANEL DOORS.

		s.	d.	£	s.	d.
Per foot super.	1in. deal, square framed ...	0	3	0	0	10
Per foot super.	1¼in. deal, square framed ...	0	3½	0	0	11
Per foot super.	1¼in. bead butt and square	0	4	0	1	0
Per foot super.	1¼in. bead flush and square	0	5	0	1	1
Per foot super.	1¼in. moulded and square	0	6	0	1	1
Per foot super.	1¼in. bead butt both sides	0	6½	0	1	1½
Per foot super.	1¼in. bead butt and bead flush	0	7½	0	1	2
Per foot super.	1¼in. bead flush both sides	0	8	0	1	2½
Per foot super.	1¼in. bead flush and moulded	0	8	0	1	3
Per foot super.	1¼in. stop chamfer and square	0	6	0	1	1
Per foot super.	1½in. deal, square framed ...	0	4	0	1	0
Per foot super.	1½in. bead butt and square	0	5	0	1	1
Per foot super.	1½in. bead flush and square	0	6	0	1	2½
Per foot super.	1½in. moulded and square ...	0	6	0	1	3
Per foot super.	1½in. bead butt both sides ...	0	6½	0	1	3
Per foot super.	1½in. bead butt and bead flush	0	6½	0	1	4
Per foot super.	1½in. bead flush both sides	0	7½	0	1	4
Per foot super.	1½in. bead flush and moulded	0	8	0	1	5
Per foot super.	1½in. moulded both sides ...	0	7	0	1	4
Per foot super.	1½in. moulded one side, bead butt other	0	7	0	1	4
Per foot super.	1½in. moulded one side, bead flush other	0	8	0	1	4½
Per foot super.	Any of above with raised panels, extra	0	1	0	0	1½
Per foot super.	Any of above with bolection mouldings, extra ...	0	1	0	0	2
Per foot super.	Doors of any of above descriptions, but with three panels instead of two, should be priced extra to the above prices ...	0	2	0	0	2

Two Panel Doors in Woods other than Deal.

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		Pitch Pine.		Sequoia.		Honduras Mahogany.		Walnut.		Teak.		Spanish or Cuba Mahogany.	
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Per foot super.	1in. 2-panel square framed doors	1	2½	1	6	2	8	2	10	3	0	3	5
Per foot super.	1in. 2-panel bead flush and square doors ...	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super.	1in. 2-panel moulded and square doors ...	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super.	1in. 2-panel moulded and bead flush doors ...	1	5	1	8	3	1	3	3½	3	6	3	10
Per foot super.	1in. 2-panel bead flush both sides, doors ...	1	5½	1	8½	3	1½	3	5	3	7½	4	2
Per foot super.	1¼in. 2-panel square framed doors	1	4½	1	7	2	10½	3	1	3	4	3	9½
Per foot super.	1¼in. 2-panel bead flush and square doors ...	1	5	1	8	3	1½	3	5	3	7½	4	2
Per foot super.	1¼in. 2-panel moulded and square doors ...	1	5½	1	8	3	1½	3	5	3	5½	4	2½
Per foot super.	1¼in. 2-panel moulded and bead flush doors ...	1	6	1	8	3	2½	3	5½	3	10	4	2½
Per foot super.	1¼in. 2-panel bead flush both sides doors ...	1	8	1	10½	3	4	3	7	3	11	4	5½

FOUR-PANEL DOORS.

		Labour only.		All materials and labour.		
		s.	d.	£	s.	d.
Per foot super.	1in. deal, square framed ...	0	3½	0	0	11
Per foot super.	1¼in. deal, square framed ...	0	4	0	1	0
Per foot super.	1¼in. bead butt and square	0	4½	0	1	1
Per foot super.	1¼in. bead flush and square	0	5½	0	1	2
Per foot super.	1¼in. moulded and square	0	6½	0	1	2
Per foot super.	1¼in. bead butt both sides ...	0	7	0	1	2½
Per foot super.	1¼in. bead butt and bead flush	0	8	0	1	3
Per foot super.	1¼in. bead flush both sides	0	8½	0	1	3½
Per foot super.	1¼in. bead flush and moulded	0	8½	0	1	4
Per foot super.	1¼in. stop chamfered and square	0	6½	0	1	2
Per foot super.	1½in deal, square framed ...	0	4½	0	1	1
Per foot super.	1½in. bead butt and square	0	5½	0	1	2
Per foot super.	1½in. bead flush and square	0	6½	0	1	3½
Per foot super.	1½in. moulded and square ...	0	6½	0	1	4
Per foot super.	1½in. bead butt both sides	0	7	0	1	4
Per foot super.	1½in. bead, butt and bead flush	0	7	0	1	5
Per foot super.	1½in. bead flush both sides	0	8	0	1	5
Per foot super.	1½in. bead flush and moulded	0	8½	0	1	6
Per foot super.	1½in. chamfered both sides	0	7	0	1	2
Per foot super.	1½in. stop chamfered and square	0	7	0	1	3
Per foot super.	1½in. stop chamfered both sides	0	7½	0	1	3½
Per foot super.	1½in. stop chamfered and moulded	0	7½	0	1	3½
Per foot super.	1½in. moulded both sides ...	0	8	0	1	5
Per foot super.	Any of above with raised panels, extra	0	1	0	0	2
Per foot super.	Any of above with bolection mouldings, extra ...	0	1½	0	0	2
Per foot super.	Any of above with upper panels quirk-moulded, extra	0	1½	0	0	2
Per foot super.	2in. square framed doors ...	0	5½	0	1	3
Per foot super.	2in. bead butt and square ..	0	6	0	1	4
Per foot super.	2in. bead flush and square...	0	7	0	1	5
Per foot super.	2in. moulded and square ...	0	7	0	1	5½
Per foot super.	2in. bead butt both sides ...	0	7	0	1	5½
Per foot super.	2in. bead butt and bead flush	0	7½	0	1	5½
Per foot super.	2in. bead flush both sides ...	0	8	0	1	7
Per foot super.	2in. bead flush and moulded	0	7½	0	1	8
Per foot super.	2in. chamfered both sides ...	0	7½	0	1	3
Per foot super.	2in. stop chamfered and square	0	6½	0	1	4

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REDUCED *FAC-SIMILE* PAGE OF SPECIFICATION FOR CHIMNEY SHAFT.

Continuation of **Specification.** *Architect.*

The concrete foundation for the shaft is to be 38ft. square and 10ft. thick, laid perfectly level. Should the Engineer think fit either to increase or diminish the dimensions of the concrete foundation or excavations such variation will be measured and valued at the schedule rates of prices to be filled in by the Contractor at the end of this Specification.

Cement Concrete.

The cement concrete shall be composed of washed or clean sharp sand and *clean* screened gravel ballast or broken stone and Portland cement in the proportion of 1½ parts of sand and 4½ parts of gravel ballast or broken stone by measure to 1 of cement. As previously specified, if sand and gravel be obtained in excavating for the foundations, so much of it as is approved by the Engineer may, after being washed and screened to his satisfaction, be used in making the concrete.

Broken stone.

The broken stone to be used in the concrete must be hard clean stone that will break into cubical forms, and not into flat, flaggy, or flaky shapes, and all dirty, soft and earthy stones must be thrown aside and removed from the works. No stone or fragment of stone is to be used which will not pass all ways through a 2in. ring, or which will not be retained all ways by a ¾in. ring.

Gauge boxes.

In preparing the concrete the proportions are to be accurately guaged in suitably constructed wooden guage boxes, and is to be mixed on clean timber stages or bankers in quantities not exceeding one cubic yard at a time, and deposited in layers to proper levels.

Mixing of concrete.

The sand and cement shall be turned over three times in a dry state, when the broken stone or gravel ballast shall be added, and the whole mass shall be turned over sufficiently to insure a proper mixture of the gravel ballast or broken stone with the sand and cement before water is added and again turned over as often as may be necessary to mix the materials thoroughly together, and such concrete must be deposited as quickly as possible after mixing in its intended position in the Works in regular layers.

Laying concrete.

The concrete is not to be dropped into the excavation, but it is to be shot down a wooden shoot, the lower end of which shall not be more than 3ft. above the surface upon which the concrete is to be laid.

The concrete is to be deposited in layers 9in. in thickness, to be well rammed and carefully levelled and finished with a fairly uniform surface at each layer. After the laying in of the concrete has been commenced it shall be followed on with continuously throughout the day, and the concrete last placed in the foundations shall not be allowed to set before the next layer is added, in order that the whole block of concrete may thus be keyed and bonded together. At the end of each day's work the layer of concrete last laid in is to be left perfectly level, but with a deeply corrugated surface, so as to form a key for the layer next to be added upon resuming work. Before putting in a new layer upon the layer last laid on the previous day, the old surface shall be thoroughly well moistened with water and a brush, so that the new material shall properly adhere.

The finished surface of the concrete is to be made perfectly even and level to receive the brickwork foundations.

The Contractor is to provide all profiles, close plankings, etc., required to keep the sides of the concrete vertical, and to remove same when the concrete is properly set.

MORTAR.

Lime Mortar.

The mortar for the brickwork is to be composed of one part of fresh well burnt blue lias lime, measured before slacking, to three parts of best *clean sharp* sand free from all impurities.

The lime is to be brought direct from the kiln in such quantities only as may be required for immediate use.

The lime mortar is to be prepared upon the site of the works in a mortar mill. The lime and sand are to be thoroughly well mixed, and incorporated with a sufficiency of water, and to be of a tough consistency.

The mortar is to be used perfectly fresh, and no mortar will be allowed to be used in the works which may have been mixed on the previous day.

Cement Mortar.

The cement mortar shall be composed of one part of Portland cement to two parts of *clean sharp* sand accurately gauged by measure; to be well and evenly mixed together, care being taken not to put too much water to the mortar while mixing. The cement mortar must be used fresh, and none that has commenced to set will be allowed to be used.

SAND AND GRAVEL.

The sand and gravel to be used in the work for mortar grout or concrete, shall be sharp and washed thoroughly clean in a suitable washer constructed for the purpose, and shall be washed until they are entirely free from impurities or foreign substances.

BRICKWORK.

General Work.

The whole of the bricks for the general work throughout are to be good, sound, approved, hard, properly burned square, ringing stocks, of approved manufacture, and equal to a sample which may be seen deposited in the offices of the Engineer and Surveyor to the Council, at the Town Hall, Leyton.

Facings.

The facings are to be of the best quality, handpicked pressed reds, equal to a sample deposit as above.

Angle Bricks.

The octagon is to be maintained internally and externally with purpose made angle bricks.

Octagonal Brick Quoins.

The quoins of the outside angles of the octagon are to be special made pressed reds as described above for facings equal to a sample deposited as above.

Blue Bricks.

The blue brick cornices, string-courses, quoins, and plinths are to be of Staffordshire pressed blue bricks of the first quality of approved manufacture, and equal to a sample deposited as aforesaid.

The blue bricks for the quoins in base and plinth are to be "bull-nosed," and a blue brick plinth course 1ft. in depth, and splayed at an angle of 45deg. is to be fixed as shown.

Bricks to be approved.

The Contractor shall obtain all the bricks from approved yards, and any bricks brought upon the works not of the first quality of their respective kinds, and not satisfactory in all respects to the Engineer, will be rejected, and must at once be removed by the Contractor and others substituted of approved quality.

Before commencing to use any bricks the Contractor must first submit fair samples of each class to the Engineer at his office, and must obtain his approval of such, before commencing the use of same upon the works.

All bricks shall be carefully handed from the carts and stacked, and no broken bricks or bats are to be brought upon the ground.

Watering Bricks.

The whole of the bricks are to be totally immersed and well saturated with water, in tubs provided for the purpose. The tops of the walls where left off are to be well wetted before recommencing them, and as often as the Engineer may deem necessary.

The whole of the brickwork throughout, including footings, walls, arches, string courses, cornices, etc., is to be built and carried up in accordance with the drawings, and is to be of the various thicknesses, heights, etc., or other dimensions as shown thereon, finishing at the top length of 19ft., which is to be 1ft. 2in. in thickness and is to be set in Portland cement mortar.

Bond.

All brickwork except where otherwise specified is to be built in lime mortar and in old English bond.

All the walls are to be carried up uniformly all round and no part is to be left more than 3ft. lower than any other. Each course is to be carried up to a uniform level throughout, and the whole of the work is to be built true and the perpends strictly kept.

Two arched openings are to be formed (6ft. by 9ft.) in the base of the shaft, as shown, for the connection of the main flues thereto. The semi-circular arches over openings to be turned in three 4½ rings of brickwork carefully bonded in mortar and lined with fire brick.

Form sunk panels in each side of the square pedestal base of the dimensions, and after the manner shown upon the drawings.

Granite Tablet.

Provide and fix, as shown, in one side of the base a well-polished approved Aberdeen granite tablet (approximate size 7ft. by 5ft. 8in.), not less than 6in. in thickness, and properly build in same as shown on the drawings.

A 3in. cast iron pipe (water main strength), with a screw hexagonal cap and spanner, is to be placed through the brickwork in the position shown upon the plan, for the purpose of inserting testing apparatus, &c.

Two blue brick cornices are to be constructed in the topmost 19ft. length of the shaft, and are to be of the depths and projections shown upon the plans. They are to be thoroughly well bonded together and set in cement, and if considered necessary by the Engineer are to be further secured with metal cramps run in with lead.

In the topmost length of the shaft, and between the two projecting blue brick cornices above mentioned, five projecting ribs are to be formed of facing bricks on each side of the octagon, as shown on the drawings. These ribs are to be spaced 4½in. apart in the clear, are to be 4½in. in width on the face, to project 3in. from the face of the shaft, and are to extend 9ft. in length. They are to be properly corbelled out at the bottom and finished at the top with splayed blue bricks. All to be set in Portland cement mortar.

Jointing.

The brickwork is to be built with neat close joints not exceeding ¼in. in thickness, and no four courses of

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An Architectural Causerie.

Esher Old and New Churches. ESHER is attracting some attention just now, by reason of the proposals of the vestry to sell some landed property owned by the church, property which, according to the delicate, but somewhat tardily-awakened, conscience of the inhabitants, it is scandalous that the Church should derive any benefit from. It seems that what is still known as the "new" church of Esher, a large and imposing edifice built in 1852, was erected from funds which had accumulated from the rents of a large piece of land bequeathed to the church nearly three hundred years ago. This land has long formed the greater portion of Sandown Racecourse, and the proposals of the Vestry, which, of course, require the sanction of the Charity Commissioners, are to sell the land outright for £12,000, and with this sum to purchase two and a-half per cent. annuities. It is a singular fact that the land bequeathed so long since by an inhabitant of Esher was once the site of the quite vanished Priory of Sandown, which would appear to have never been revived after the Prior, with all the brethren, perished in that great pestilence, the "Black Death," which swept over England in the Middle Ages.

There is some unconscious humour in this attempt of the Esher church people to remove what they consider to be the stigma attaching to their ownership of so ungodly a thing as a racecourse. They are unwilling to bear the discredit of it, but not unprepared to retain the monetary advantage. How disingenuous, this shuffling!

The church, built forty-eight years ago, is worth seeing, if only for the Royal Pew, designed to accommodate the royalties of Claremont, overlooking the chancel, high above the heads of the common herd in the body of the building. Even in the House of God is pride of place made to assert itself. The proper corrective of this ostentation and pomp is seen in the humble old church, hidden away behind that old coaching inn, the "Bear," on the other side of the village street. Closed now for nearly half a century, it is only used as a mortuary chapel, and is given over to spiders, dust and decay. The interior of this little building is rendered theatrical by the mouldy old Royal Pew built on the south side, and looking very much like a box at the opera. It was built for Princess Charlotte and her husband, who lived at Claremont for a very brief period at the beginning of the century. The Princess Charlotte was the only child of George IV., and had she lived would in due course have become Queen of England, instead of the Princess Victoria. But she died in 1816, and Claremont was deserted and the Royal Pew here unoccupied. In its dusty and threadbare state, and thickly covered with cobwebs, it preaches an eloquent sermon on the fleeting nature of earthly pomps. The addition made to the south side of the church for the purpose of building this pew and a separate entrance to it, apart from the way by which the plebeians came to worship, is seen in the accompanying sketch.

C. G. H.

ESHER OLD CHURCH. DRAWN BY C. G. HARPER.

The Avatar of a "Sky Scraper." THE life of the big iron tower that, for the past ten years, has been the principal landmark of Paris to countless thousands of tourists, has been in serious jeopardy of late, not from any insidious internal malady, but by reason of the open attacks of many resolute and well-armed enemies. If it has succeeded in escaping destruction, it may be said to have been almost literally by the skin of its teeth, since to obtain a respite it has had to doff its coat of red and assume one of yellow instead. It was not only the artists, who, on the ground that the continued presence of the tower formed a permanent insult to the people who cherish the "cult of the beautiful," made an onslaught on this materialisation of one of the most grandiose dreams engineer ever had. Arguments appealing far more directly to the vulgar were brought forward by the score. "Leave the tower," chorused in unison architects and builders, despairing of ever surpassing M. Eiffel, "and the Exhibition of 1900 will be but a second edition of that of 1889; everybody's nose will be tip-tilted in the air as it was then, and none of our more lowly *chefs d'œuvre* will receive so much as a glance or, what is perhaps more important, a franc. If it cannot be torn limb from limb as it deserves, let it at least be changed out of all recognition! Alter its shape; cut its head off; lay it on its side; humble it in the dust. Make a tunnel of it, a bridge, a telescope, an aqueduct, what you will! Don't leave it as before."

The tower heard and trembled, as did all its friends scattered over the two hemispheres. It is not for nothing that a particular spot has been one of the favourite pilgrimages of half the well-to-do honeymooning couples in the world, and many a fond souvenir is cherished of the day when *he* and *she* "lost," as a story-writer might say, "'twixt earth and heaven, but strong in each others' affection," looked over the balustrade at the panorama spread out far down below. The tower has won many suffrages also by the liberal policy adopted by the management of tolerating the exercise of some of the most deep-rooted instincts of sight-seeing humanity. So long as the plate-glass windows of the lifts are respected, the visitor, whether he be named John Smith, of London, or Ivan Ivan, of Moscow, may scribble, carve, or paint as much of his family history and private sentiments as he considers will interest subsequent visitors, where he will, or rather where he can. In spite of all these sympathisers, however, the tower was anxious. Philosophers, who, it must be confessed, have very often little or no practical experience of what they preach, declare that the wise man in his prosperity does not tempt Providence by too insolent a parade of his wealth. If possible, envy and jealousy should not be aroused at all; at any rate, they should be conciliated if their presence is unavoidable. Whether right or wrong, these counsels have been adopted by the Eiffel Tower in its hour of danger. After long casting about to discover the best way of making itself as little conspicuous as was consistent with a modicum of self respect, it has borrowed a hint from the chameleon, which, in order to escape detection by its enemies, assimilates its hue as far as possible to that of its background.

The chameleon, however, knows instinctively what colour will best serve its turn while the Eiffel Tower, the first of its species, has no instinct to rely upon but that of self-preservation. The consequence has been that, for several weeks, it presented but a sorry spectacle, experimenting first with one colour and then with another. The only thing clear was that the old fiery red would not do. Now the tower was daubed all over

ESHER CHURCH. BUILT FROM THE RENT OF A RACECOURSE.

with sky-blue, now its nether limbs were as white as the fleecy clouds, now as grey as the river—anon yellow. It is the last colour that finally carried the day, and for some weeks the Eiffel Tower has been clad in a mantle of "degraded" yellow. In order still further to avoid diverting attention from the stucco palaces that cluster round its base, the lower parts of the tower have been painted a very dark shade, the colour gradually becoming lighter and lighter as the summit is approached. After nightfall, however, the tower will have its revenge, for its contour will be outlined by scores of lights. To paint such a structure as the Eiffel Tower is no easy task. The exact number of miles all the girders would stretch to if placed end to end, he whose soul hungers for such details may find clearly set forth in various guide books. It may be more to the point to say that considerably over fifty tons of paint were employed, and the work took over four months. In spite of everything, the Eiffel Tower, even in its "degraded" yellow dress, bids fair to be head and shoulders above all its many competitors for public favour next year. A. A.

"Renaissance."

Mankind, said a famous statesman, are "the slaves of words and phrases." Perhaps there is no word more abused than "Renaissance." The revival of classical learning in Italy led the Italians to revive the classical Architecture, subject, however, to some important modifications, and this, together with the changes of subjects and treatment in sculpture and painting, is collectively known as the Renaissance. In Italy the great masters in art aimed, on the whole, at preserving the dignified simplicity of the ancient designs. So long as the system was confined to Italy it was shown to be suitable to the climate and people of the country; the same could not always be said of it when it had once crossed the Alps.

Beautiful, indeed, as are the French chateaux of Francis the First's time, designed under the influence of Serlio and Primaticcio, quaint as are the buildings of the Low Countries and northern Germany, we can yet understand the reluctance of our forefathers absolutely to give up Gothic. The Italians in their Renaissance were mainly reverting to a national style long forgotten or overlaid by an invasion of Gothic from the north; the northern nations were attempting to adopt Classic forms to Gothic designs. Sometimes the combination resulted in a thing of beauty, but sometimes also in failure, particularly when the columns and architraves of the ancients, carefully designed upon an elaborate system of proportions and corrected by subtle curves, were taken, altered, mutilated, and made to fit as details of northern buildings. A general loosening of architectural conventions began to prevail; inconsistency and incongruity are often found in the works of this period. In our own day the word has become a pitfall for the unwary public, and suburban builders of villas and "high-class" blocks of shops and flats decorate their incongruous creations with odds and ends taken from every known building in Bruges, Amsterdam, and Bremen, gables from Antwerp, œuil-de-bœuf windows from Fontainebleau, and pilasters from Heidelberg. To all criticism as to fitness or harmony there is but one answer vouchsafed, "Renaissance." Yet if the best of the artists who began the various innovations and combinations of that time and founded the national styles of modern Europe in so doing, could speak, they would tell us that the last thing they had in their minds was to interfere with the great harmonies of Architecture by deluging it with a mass of ill-assorted detail. J. C. P.

On Reflection.

The South African Architect.

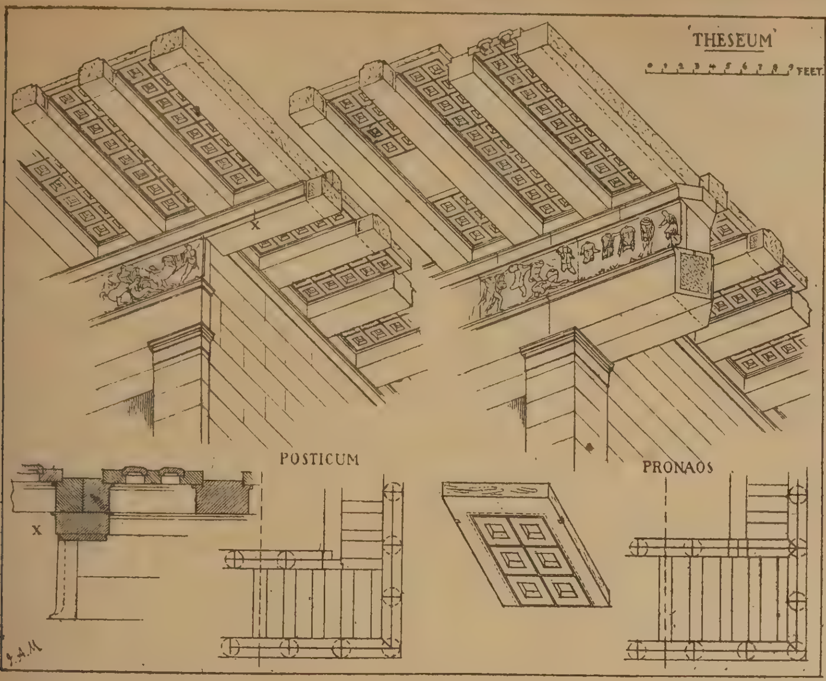
For the past month or so the dread cry of war has been dinning in our ears, now screeching loud, now comfortingly moderated, fitful as a wave; and by the time these words reach our readers, hostilities may have actually commenced. Everybody connected with South Africa has been more or less affected by recent events, and, amongst these, we must especially include those fellow countrymen practising as architects, contractors, engineers, and others similarly employed. These men, and their predecessors, have had a very large share indeed in the building up of the colony. The gold and the diamonds were, of course, the primary power, but the men referred to were those who developed the effects of that power. Johannesburg is an example. This has been called the "city of light heart and open hand." It was not always so. It was rather different from that in 1887, the date of its foundation. At the present time its big edifices are still standing, but the streets present a mournful spectacle, and all building and engineering operations are stopped. Johannesburg grew with amazing rapidity, then slackened its pace a little, and during the last three years has been nearly at a standstill. Some time ago the officials of the great companies, the mining engineers, and almost every educated and expert workman in a position of trust, could obtain a yearly salary which ran into four figures. Nearly one third of the inhabitants of Johannesburg were earning incomes of about £400 a year. A house worth £300 a year a few years ago could this year have been obtained for £120. The building boom came to an end even before the outbreak of the present troubles. Valuable sites were desolate, and near the railway station yawned the excavations for a projected grand hotel. But the war scare and its attendant evacuations have widened the abyss, and there is no saying that Johannesburg *in toto* may not be swallowed up in it. Architects in this country in the midst of a flourishing connection may well sympathise with those whose practice is—until South Africa is again quiet—completely ruined.

A Labour of Love.

Enthusiasm is the power that carries everything before it. Without it obstacles look mountainous; with it they become as mole hills. And for a good example one should pay a visit of inspection to a site a little outside Northampton any Thursday or Saturday afternoon. It appears that a new edifice called Christ Church was opened in the district about a year ago, the work of which has so developed that the present accommodation is inadequate and the congregation are badly in need of a new Sunday school and parish room. They were obliged to get additional accommodation in some way or another, and as they found that they could not afford to pay for the erection of a new building they decided to save the cost of labour and to build it themselves. Now everyone is not of such a practical turn of mind, nor possesses the same zeal as these worthy people. The firm of contractors who built the church seem to have caught the spirit of their would-be clients, for they very generously offered to supply the necessary materials at cost price. This was not all. Among the congregation there is an architect. He prepared the plans for the new building without charge. Nothing could be better, and on the afternoons mentioned the site is now covered by the busy workers, and "gentlemen well-known in the business circles of Northampton" may be seen strutting about with hods on their backs! Such work as can only be done by skilled artisans is done by bricklayers belonging to the church, while the less skilled portion is engaged in operations which, had they been told of it years ago, would have startled them exceedingly. The joiners of the congregation will soon be at work. Meanwhile everything is proceeding merrily. Whilst not advocates of anything that may approach unworkmanlike building, we think that, in the present circumstances, the members of Christ Church are to be congratulated on the practical way in which they have solved their difficulty. When clergymen find that additions are needed to their buildings and funds are short, it is usual for a bazaar to be held, at which people are induced to pay very excessive prices for things. This is a new method, which reminds one of the well-known case of the Cumberland clergyman and his daughters who built their rectory from bottom to top. Another vicar has recently been following their example by painting his schools himself, as money was short. It is a fitting conclusion to say that, in the building operations now going on outside Northampton, the vicar of the church and the master of the grammar school are the two most conspicuous workers.

Ladies as Sanitary Inspectors.

In some cases good results have followed on a man's vocation being adopted by a woman; in other cases the reverse has happened. But the appointment of lady sanitary inspectors, for some purposes, must be admitted to be a beneficial reform. The chief duties of a lady in this position would be to look after the women and children in her district, to give instruction to them, and to see that sanitary conditions were conformed with. Such work it would be impossible for a man to accomplish with the degree of success attained by a lady inspector. The Liverpool Corporation now employs eight lady sanitary inspectors to look after those who live in the slums and poorer parts of the city, and at the recent Health Congress at Blackpool the Medical Officer of Liverpool spoke highly of the work they had done. An expression of opinion of this kind, given after practical experience, is worth all the talk of those who cannot speak from such experience. At the same congress a paper was read by Mrs. Redford on the work of the Women's Health Society, which was started about forty years ago in Manchester and Salford. Nine out of the sixteen Health Visitors at Manchester are paid by the Corporation, while the Salford Corporation also pays for four. The work of the lady sanitary inspector has its chief results in the lowering of the death rate, which is accomplished by a careful supervision of the various homes. This is a great work in itself, but, in addition, the health of the community, as a whole, is improved by such efforts, and it is to be hoped that in the future the position of the lady sanitary inspector will be thoroughly appreciated, and her work responded to. The more general employment of tactful and properly qualified women as sanitary inspectors would, we are convinced, be an important factor in raising the health standard of the community to the highest possible level—an object which it ought to be one of the chief anxieties of every municipality to achieve.



WITH GREEK BUILDERS.

By JOHN A. MARSHALL.

(*Continued from page* 121, *No.* CCXLII.)

V.—THE STONE CEILINGS OF PERIPTERAL TEMPLES.

"AN account which I received from Aristarchus, the Interpreter of Antiquities at Olympia, I must not omit. He said that in his youth, when the people of Elis restored the roof of the temple of Hera, the body of a dead man in heavy armour, who had been badly wounded, was found between the sham roof and the roof on which the tiles lay. This man was a combatant in the battle fought inside Altis, between the Lacedæmonians and the people of Elis. For the people of Elis climbed up to the temples of the gods, and all high buildings alike, for the purpose of defence."

From this statement by Pausanias, who visited Olympia in the middle of the second century A.D., it seems clear that in the early part of the fourth century B.C. the Heraion at Olympia had a horizontal ceiling, apart from the pedimental roof; and it is considered highly probable that this roof and ceiling, superseded, in the seventh or sixth century B.C., a flat roof covered with sun-burnt bricks.

It is noteworthy that the earliest stone ceiling found by the Germans at Olympia was that to the peristyle of the Philippeion, a circular building, erected at the close of the Hellenic age. Nearly all the other buildings, including the Heraion, the great Temple of Zeus, and the Metroon, with their outer colonnades and vestibules, had ceilings of wood throughout.

Generally, in Greek temples of the ordinary type, the wood ceiling was limited to the naos; while the pronaos, the epinaos, and the peristyle, which were exposed to the outer air, had ceilings of stone.

For rectangular compartments, such as the porticoes of the Propylæa and the Erectheion, the arrangement of the beams to support the lacunaria was a very simple matter; but for the outer circuit of Doric peripteral temples it was necessary to resort to some expedient at the angles by which the ceilings at the ends and flanks could be treated independently. In front of the pronaos and epinaos the ceiling was usually continued across the flanks, so as to occupy the full width of the building, and, in the case of the front portico, the separation from the flanks was marked by extending the architrave and frieze of the pronaos to the columns of the peristyle. To meet this requirement it was essential, in setting out the plan of the temple, that the columns and antæ of the pronaos should be placed on the axis of one of the columns on the flanks, in order that the architrave might be received by the abacus of the cap. Generally, this column was the third from the angle, so that the peristyle at this end had somewhat the appearance of a spacious and independent portico.

The Theseum and the temples at Assos, Sunium, and Rhamnus are examples of this arrangement.

At the back of the temple, the architrave and frieze of the epinaos were always stopped at the antæ, and to disconnect the ceiling from the flanks, only the moulded band on the top of the frieze was carried across as a beam. The position of this beam in relation to the columns of the peristyle was not important, seeing that it was placed so much above the level of the caps. Still less was it essential that the ceiling beams should be placed over the columns, although it seems to have been an invariable rule to place one over the central intercolumniation. In Ionic temples, where the ceiling beams rested on the architrave, and were placed over the columns, the antæ of the pronaos and epinaos were placed on the intersection of the axes of the second columns on the ends and flanks. The ceiling beams over these columns thus formed a square compartment at the angles of the peristyle, and the ambulatory was, of course, the same width all round, as at the Temples of Teos and Priene, and probably the Mausoleum. For large temples of the Ionic type, the porticoes were increased in depth by introducing additional rows of columns, but the various colonnades were kept a uniform distance apart, so that the ceilings formed a number of square compartments, coinciding with the intercolumniations.

A few examples may now be described in detail. *The Theseum.*—Here the architrave and frieze of the pronaos are continued across to the third column on the flanks of the peristyle. For the epinaos, the architrave and frieze are stopped at the antæ, and merely the moulded band on the top of the frieze is carried across to take the ceiling beams of the portico. This band being only 8in. deep, an additional thickness is given to that portion which spans the ambulatory, and this extra thickness is notched on the slabs of the sculptured frieze, in a way that seems to indicate an afterthought. (See the casts in the Museum.) The return face of the antæ, unlike that of the pronaos, bears no definite relation to the beam over, but simply serves to stop the mouldings of the cap and architrave, the latter having a projection worked on the return end with this object.

The ceiling beams are 1ft. 8in. wide, about 12in. deep, and 2ft. 9in. apart; the bearing for the front portico is 12ft. 9in.

In setting out the ceilings of the porticoes, a beam is placed, as usual, next the peristyle on the flanks, probably from æsthetic motives, but which also resulted in the practical advantage of keeping the lacunaria stones clear of the roof timbers.

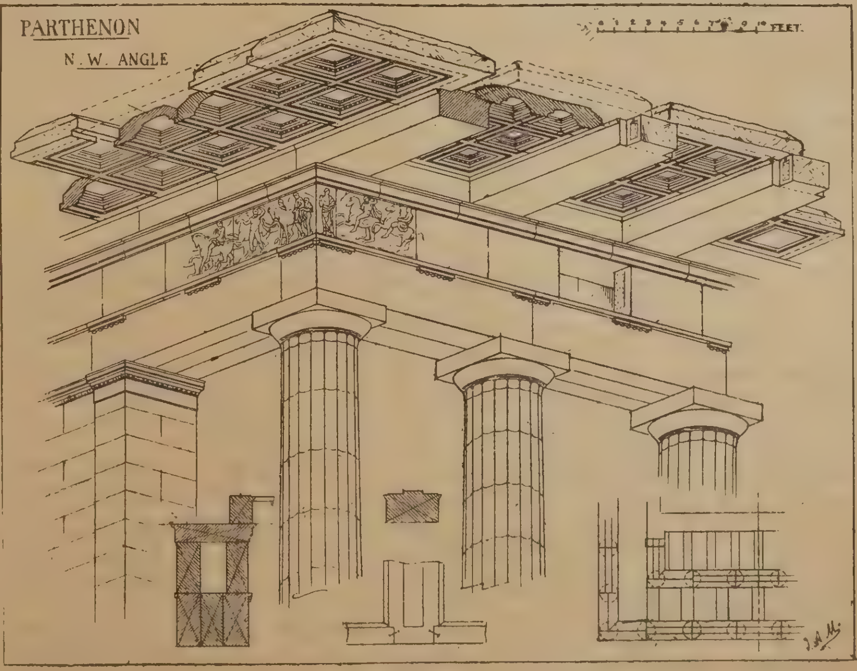
For the rest of the ambulatory, a rafter could be placed in the spaces between the ceiling stones, while every other rafter would probably have to be notched over the latter.

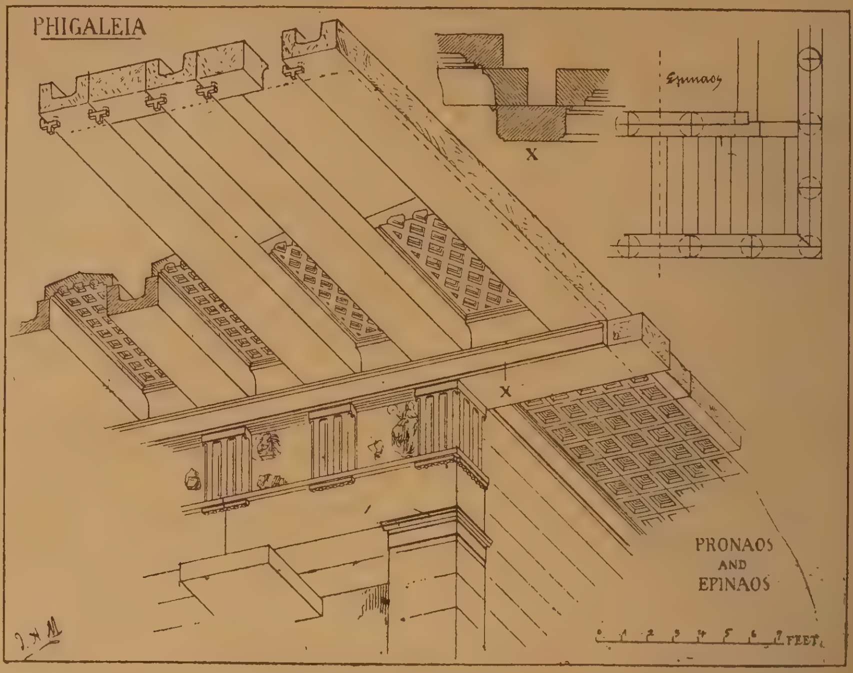
The lacunaria stones rest in rebates, cut along the top of the beams, and the projecting moulding on each side of the beam is relieved of the weight by a slight scamillus.

Plain, square coffers are cut completely through the ceiling stones, and separate covers, 10in. square, are fitted in rebates around the top of each coffer.

The jointing of these slabs, on the soffit, is concealed by a flush bead, which no doubt had its origin in the requirements of wood framing. A lacunaria stone is in the Museum, but its position there has evidently not been selected with a view to the convenience of the inquisitive student. Two cover stones for the coffers are also in the same room.

Temple of Nemesis, Rhamnus.—A smaller structure than the Theseum, and probably of later date, but the general arrangement of the





ceilings is the same. The frieze in front of the pronaos and epinaos was quite plain, but the architrave is of the usual Doric type, with tænia, regulæ, and guttæ. At the epinaos the return face of the antæ is exactly the width of the beam over, which spans the ambulatory, and it only required the introduction of an angle triglyph in the frieze to complete the connection.

The ceiling beams are 1ft. 2in. wide, 9in. deep, and 1ft. 11in. apart; the bearing for the front portico is 9ft. 9in. The lacunaria stones, which are 4in. thick, are cut through for the coffers, leaving the bars of the trellis only 3½in. wide. The slightness of this framing made it impossible to cut a separate rebate around each coffer for the cover stones, so the whole surface is dished, leaving only the outer margin 4in. thick, while the intermediate bars are reduced in thickness to 2¼in.; a small projection, or fillet, was, however, left on the top of the bars to make them stronger, and the bottom edge of the cover stones was cut away all round to overlap the fillets.

The cover stones are 9in. square and 2½in. thick, with sunk panels, enriched with an egg and tongue moulding. These panels being on separate stones, it is evident that the carving could be done with ease.

To fill in the spaces between the ends of the beams on the walls and peristyle, a moulded facia 2in. thick is let into grooves cut in the sides of the beams, the mouldings at the angles being mitred in the usual way. The relation of the roof timbers to the ceilings was probably the same as at the Theseum.

Temple of Apollo, Phigaleia.—Due—if we may credit Pausanias—to the unfettered genius of Ictinus; but whether by Ictinus or not, it must, according to Furtwängler, be later than the Parthenon.

Here the ceilings of the pronaos and epinaos are treated alike. The architrave and frieze are stopped at the antae, and merely the wall plate, or band, above the frieze, is carried across the ambulatory. The frieze is furnished with triglyphs and sculptured metopae (see fragments in the Museum), and these have determined the positions of the ceiling beams, an arrangement that has left a wider space between the beams at each end of the porticoes. The beams are hollowed out on the top, the object being to reduce the weight, and thus increase the strength; and the mouldings, which in other Doric examples are worked along the sides of the beams, are here worked on the lacunaria stones. Another peculiarity is seen in the blocks which fill up the spaces between the ends of the beams; these are moulded independently, and butted against the beams; while to keep them in position they are clamped to the beams on the underside, and a dowel, in the middle of each clamp, is let into the wall plate. There are no beams across the ambulatory, and the ceiling stones here rest directly on the wall plate. They are thus on the same level as the beams of the end porticoes, a position which kept them well clear of the roof timbers; while on the flanks of the porticoes the ceiling stones would be kept clear by the beam placed in the usual way.

It would be interesting to know how the lacunaria stones were jointed, but on this point we have no information to offer.

The Parthenon.—For a Doric temple, the plan of the vestibules is abnormal, and resembles somewhat the later Ionic types of Asia Minor. At each end a secondary row of columns is introduced, and the ambulatory is kept nearly the same width all round the building. The space between the inner colonnade and the naos takes the place of the ordinary pronaos and epinaos.

In arranging the ceiling at each end, the usual method of letting it occupy the full width of the building is here reversed by running the ceiling of the flanks through from end to end, so that the ceilings of the porticoes are restricted to the width of the cella, and the proportions improved.

The wall plate on the top of the frieze is continued around the cella without interruption, but above this, on the flanks, is another moulded band, which is carried across the end porticoes as an ordinary ceiling beam. The intermediate beams are placed 6ft. 6in. apart, with one in the centre; they are 3ft. 3in. wide, and 2ft. deep; the bearing is 10ft. 6in.

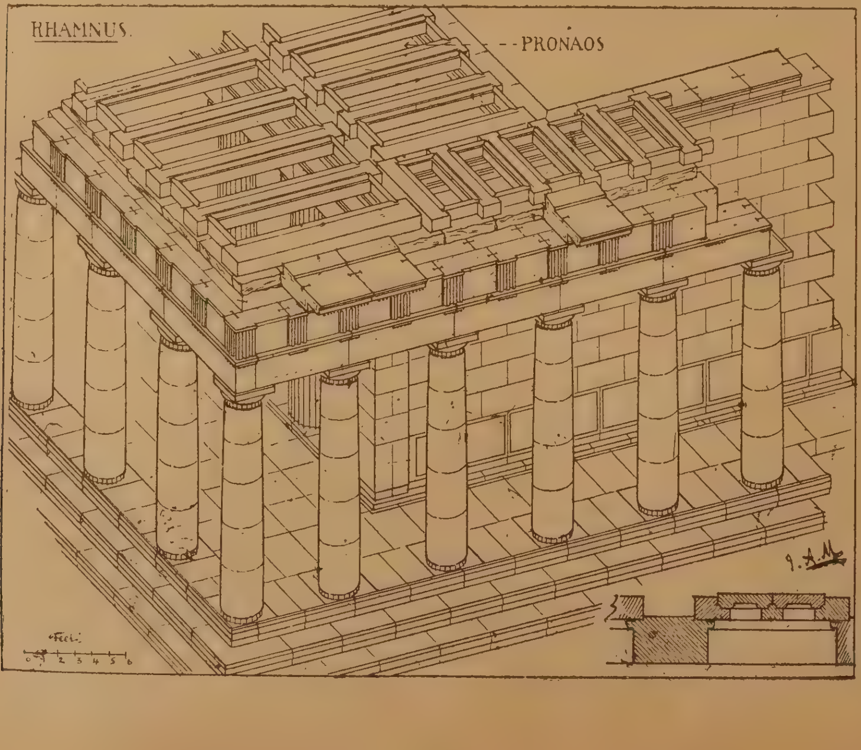
Like the temple at Phigaleia, there are no beams across the flanks, the lacunaria stones being dependent on the cella wall and the peristyle only; additional security was, however, obtained by rebating the stones on to each other at the joints. The lacunaria stones were deeply coffered, very much in the style of the later Ionic. It will be evident that the uniformity in the ceiling of the flanks would result in a corresponding uniformity in the treatment of the roof timbers—but the relation between the stone ceilings of peripteral temples, and the rafters of the roof will be more clearly seen when we come to consider the corona and roof tiling.

The Mausoleum.—Respecting the general arrangement of this ceiling, it is probable that it covered an ambulatory of a uniform clear width of about 7ft. all round the building. The compartments were square, and coincided with the intercolumniations of the peristyle. The architrave was in two thicknesses, laid flatwise, and the ceiling beams were brought into close relation to the columns by notching them into the lower section of the architrave.

The square compartments of the ceiling were gradually covered in by first framing around each opening four wide slabs, mitred at the angles; on these were placed smaller slabs, similarly jointed, and which still further reduced the opening; the central apertures were closed by square panels, which, it has been assumed, were identical with some sculptured panels discovered among the ruins by Sir C. T. Newton (see the restoration in the Museum). The carved mouldings of the ceiling beams and architraves are not, it will be observed, worked out of "the solid," but on separate stones, let into rebates; doubtless a matter of expediency, and suggestive of decadence.

The "Nereid" Monument.—For the ceiling of the ambulatory there are no separate beams, but projecting fillets, or ribs, are worked on one side of each lacunaria stone, and rebated on the top to receive the adjoining stone. The stones in the Museum were probably for the flanks; they are 3ft. long, and 1ft. 9in. wide, and were dowelled together at the sides; two coffers are sunk in each. A model in the Museum shows the general effect of the ceiling, but the arrangement at the angles of the peristyle is, we believe, conjectural.

Pseudo-Doric Temple, Samothrace.—The ceiling for the portico of this building of Hellen-



istic times was essentially Ionic in type. The architrave was jointed in the Doric fashion, but the ceiling beams which rested on it were placed over the columns only. These beams were nearly 20ft. in length and 7ft. 9in. from centre to centre, and to support the massive lacunaria stones (1ft. 6in. thick) they were gradually increased in depth towards the middle, somewhat in the manner of a bow girder.

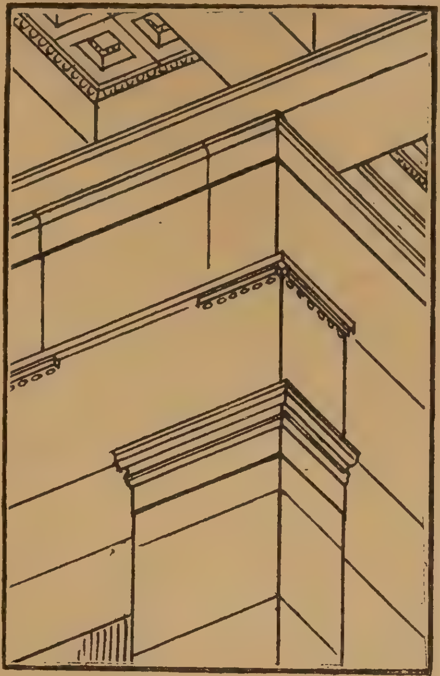
The stone ceilings over the pronaos and posticum of a Greek temple of the ordinary type call for no special comment, seeing that they were generally a counterpart of the ceilings over the end porticoes, already described.

(*To be continued.*)

OUR NEW JOURNAL.

Under the title "A Unique Trade Journal which has a career before it," "The Newsagent" says:—"We hinted a short while ago that in view of repeated representations from leading furniture manufacturers and designers that they and their allied trades were inadequately represented, the proprietors of the Builders' Journal and the Architectural Review had determined to publish a monthly trade journal under the title of the Furnisher. That decision has been put into practice, for the first number of the Furnisher lies before us. In style, appearance, and practicability, it is far and away the best publication of the kind in London or the provinces, and if it has the same amount of originality and studious care that are thrown into the papers already issued from Effingham House, Arundel Street, Strand, it has before it a prosperous future.

"The Furnisher appeals to all interested in furniture, decoration, upholstery, art metal work, stained glass, and electroplate, thus covering a very large field for circulation. Illustrations of a high class are scattered throughout its pages, the paper is of superior texture, and the printing of the best in vogue in London. The publishers are prepared to deal with newsagents on a generous scale. They offer to supply copies at the following rates: carriage paid, 13/12, 4s. 6d., on sale or return. So as to push the sale of their unique journal they have had a circular prospectus prepared, and these can be had simply for the asking for distribution to customers. The price is 6d. monthly. The trade would do well to take our advice and give this new journal, which has a strikingly original embossed cover, a fair trial. Personally, we wish the Furnisher *bon voyage*, and hope it has come to stay."

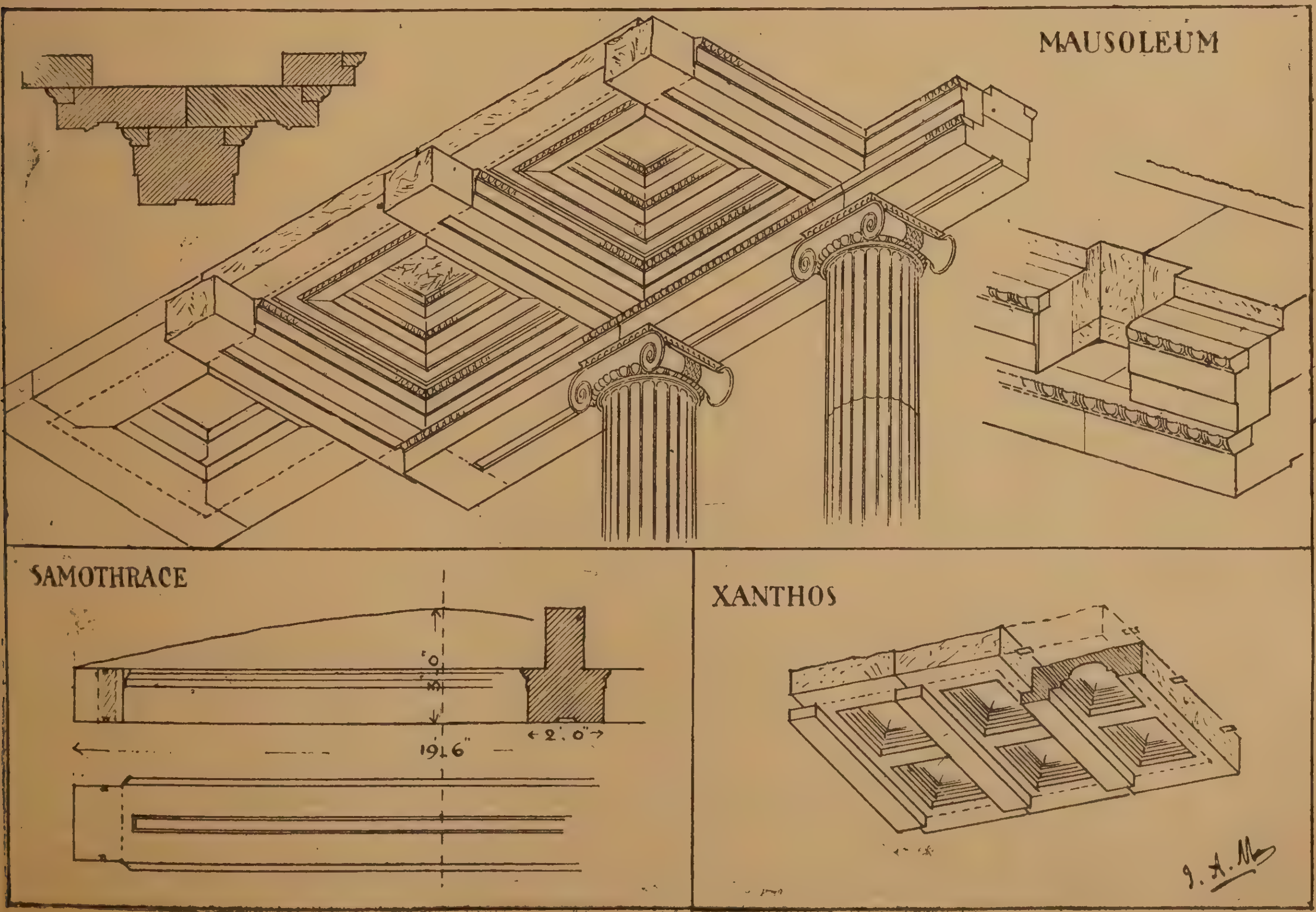


RHAMNUS. ANGLE OF EPINAOS.

ARCHITECTURAL ASSOCIATION.

ANNUAL GENERAL MEETING.

Last Friday evening, the 6th inst., at No. 9, Conduit Street, the Architectural Association opened its present session, when there was a good attendance. Mr. G. H. Fellowes Prynne, F.R.I.B.A., the president of the Association, was in the chair. The minutes of the last meeting were first read by Mr. G. B. Carvill, hon. secretary, and confirmed. The secretary then read a list of nominations. Mr. W. H. Seth-Smith then proposed the adoption of the report and balance-sheet of the year. He said it was always a pleasurable duty when the balance was on the right side as it was this year, and when it was better than last year. In every way they might feel that the Association was in a flourishing condition. Things had been placed upon a good basis, especially with the educational side, and this would assure that the financial condition of the Association would remain stable. There had been an increase in membership to the number of fifty-two. There were several reasons for this, one being that many of the old members had rejoined; there had, of course, been the usual resignations. Payments had been made stricter than they ever were, and this told against the increase of membership. Thanks were due for the very useful grant of £100 again made by the Royal Institute of British Architects. Mr. Seth-Smith, in dealing with other points in the report, expressed thanks for the papers and discussions given during the last session, and he expressed belief that there was no other society in London which provided more valuable papers than the Association did. Mr. Francis G. F. Hooper, in seconding the adoption of the report and balance-sheet, expressed regret that more than one of the prizes had not been awarded, but he thought that the remedy was in the hands of the members; the subjects had been as attractive as they had ever been, but the competition had been so small and the work done of not



sufficient merit to place it in the running with previous work. The report and balance sheet were carried unanimously. Mr. Hampden W. Pratt proposed a vote of thanks to the honorary auditors, who had done so much hard work—the vote was carried unanimously. The president announced that Mr. G. Collins and C. A. Kelley had been reinstated. He proposed Messrs. H. A. Satchell and A. H. Hart again as members of the committee, they having resigned in accordance with the rules as to officials. This was carried unanimously. He then proposed a vote of thanks to the Royal Institute of British Architects, for the grant they had made and for their great services to the Association, which the Association thoroughly appreciated. They, perhaps, had some right to expect these things, as they supplied the Institute with a vast number of students at every examination. The vote was carried by acclamation. Classes and lectures for the session were announced. The awards of the past sessions were then read and the prizes presented; the full list is as follows:—

PRIZE LIST.

The following is the prize list for session 1898-99:—A.A. Travelling Studentship, value £25, and bronze medal, D. T. Fyfe; second prize, value £5, H. Tanner, jun.; hon. mention, H. Farquharson; A.A. medal, not awarded; prize, value £5 5s., H. Tanner, jun.; Andrew Oliver prize, value £5 5s., G. J. T. Reavell; Arthur Cates Scholarship, C. L. Fleming-Williams. Lectures: Division I. —Silver medal and A.A. Scholarship, value £6 6s., P. J. Westwood; bronze medal, A. R. Conder; hon. mention, H. J. Worrow. Division II.—Silver medal, P. J. Turner; bronze medal, H. S. Barrett; hon. mention, R. H. Spalding. Studio: Division I.—Silver medal and one volume of the A.A. Sketch Book, S. V. North; bronze medal, A. A. Carder. Division II.—Silver medal, A. Symon; bronze medal and one volume of the A.A. Sketch Book, G. H. Jenkins; hon. mention, W. J. Davies.

The following is the order of merit:—

Division I. — Greek and Roman Orders— C. H. R. Henman, certificate; S. V. North; P. J. Westwood. Elementary Construction— P. J. Westwood, certificate and book; B. Greig; A. R. Conder. English Architecture—P. J. Westwood, certificate and book; A. R. Conder; G. L. Elkington. Mediæval and Renaissance— S. H. Goodwin, certificate and book; B. Greig; S. Bridges. Elementary Physics, Formulæ, and Calculations—H. J. Worrow, certificate and book; P. J. Westwood; B. Greig. Plane and Solid Geometry—W. A. Jeckells, certificate and book; A. R. Conder; H. J. Worrow.

Division II.—Materials, their Nature and Application—T. G. Chambers, certificate and book; H. S. Barrett; P. J. Turner. Construction—P. J. Turner, certificate and book; R. H. Spalding; A. S. Dorrell. Drainage and Water Supply — P. J. Turner, certificate; P. B. Dannatt; J. E. Franck. Ventilation, Lighting, and Heating—J. E. Franck, certificate; S. H. Goodwin; P. J. Turner. Professional Practice—P. J. Turner, certificate; S. H. Goodwin; J. E. Franck. Elementary Class of Design—First prize, value £1 1s., with silver medal and certificate, R. Knott; second prize, bronze medal and certificate, E. S. Collins; hon. mention, E. Brantwood-Muff. Advanced Class of Design—First prize, value £1 1s., with silver medal and certificate, J. A. Swan.

PRESIDENT'S ADDRESS.

The president then delivered his inaugural address as follows:—Gentlemen, and Fellow-Students in Architecture: My first words in addressing you for the second time from this chair, must be to express my warm appreciation of the honour you have done me in re-electing me as your president for the ensuing year. If when I first accepted this honourable and important position, I felt that the responsibility was a great one, I can assure you that, after a year in office, my sense of that responsibility has increased rather than diminished, and it is with no small diffidence that I again accept the post of president of the Architectural Association. However, the very fact of my re-election leads me to hope that I still have your confidence, and that I may depend upon your help and support during the coming session. I can only promise you I will give in the future, as I indeed have tried to do in the past, my best services and energies to the interests of the Architectural Association, and its grand educational work. Before proceeding with the more formal part of this address, I cannot refrain from first expressing my warmest gratitude to each individual member of the late committee for their unswerving loyalty and support given to me as their chairman during the last session, and especially to the hon. secretaries, Mr. Howley Sim and Mr. G. B. Carvill, and our secretary, Mr. Driver. Nothing could have exceeded the harmony and good will that has existed on all sides. There has, as far as I remember, been

No Single Note of Discord.

All have worked with one end and aim—the good of the A.A.—with the natural result that I think we may fairly congratulate ourselves upon the exceptional — I may say, almost phenomenal—success, both from a working and financial point of view, of the past session. First, as regards membership, I am glad to be able to state that the roll of members is the highest on record, and that the total now exceeds 1,250. That our financial position is equally sound and satisfactory may be judged from the fact that, in spite of necessarily increased expenditure, we are able to carry forward a record balance of not less than £224 odd to our premises and general fund. In my opening address last year it may be remembered that I called special attention to the work of the studio, and more particularly to that branch of its work that most closely binds us with the past work of the Association, and is still most closely allied to the voluntary system of teaching—I mean

The School of Design.

I then pointed out that the committee had been a good deal puzzled to find out the cause for the general falling off in the membership and work of this once popular class, and I expressed my earnest hope that the alterations made as to the fees, and the working out of designs would make the work of that class more really representative of the work of the Architectural Association. My hopes have been more than verified, and it is most satisfactory to find that the efforts of the committee have in a great measure succeeded in making both the elementary and advanced classes of design as they should be, not only the most popular, but one of the most useful classes in the whole system of the work of the Association. As against the numbers of twenty-two and twelve students who joined the elementary and advanced classes of design respectively in the previous session, no less than seventy-eight and seventeen students joined during the last session. This success was, I am glad to say, not confined to numbers only; the work done showed a great advance on that of some previous years, and some designs sent in were of considerable merit.

The Interest and Enthusiasm

was, however, partly perhaps owing to numbers, better sustained in the elementary than in the advanced class. It is hoped that this may be remedied in future years, as the committee, profiting by the experience gained during the last session, have wisely decided to make the subjects in the elementary class somewhat more elementary in character, with the view of inducing all students who join the elementary class in their early years of study, as a matter of course to follow on into the advanced class, which in future will not be an advanced class in name only. I do most sincerely hope that all students who joined the elementary class last session will rejoin the School of Design this year, and continue their studies, either by going on into the advanced class, or remaining for another session in the elementary class of design, as I cannot too strongly urge upon students that it is not by one or two flashy, or perhaps even clever designs, made in a single session, by which their work will best be judged, or that will be of most value to them, but by carefully giving their attention to the smallest details in design, and methodically following on their work stage by stage for two or three sessions. "Do little things now," says

A Persian Proverb,

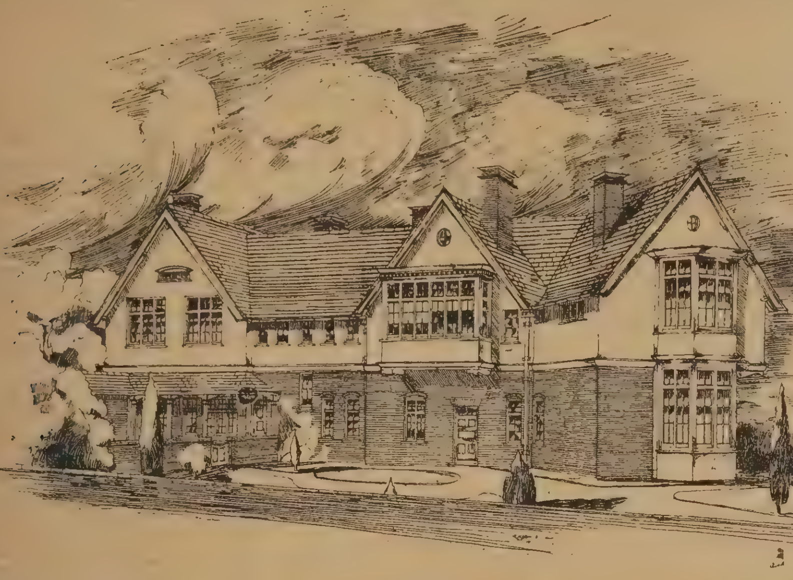
"so shall big things come to thee, asking to be done." It is no small thing for students to be able to get the advantage of criticism upon their early work freely and ungrudgingly given by many of the well-known artists whose names appear on our visitors' list, and I cannot too strongly advise them to get as much out of those visitors as they possibly can while they have the chance. I think those who were present at the first meeting of the studio on October 11th last year will have appreciated the innovation of opening the session with short informal addresses to students, when Mr. Aston Webb and Mr. Cole Adams so kindly gave us their valuable support. It is not too much to say I think that this meeting inspired very genuine enthusiasm amongst the students, old and young, and that Mr. Aston Webb's useful hints on planning, and warm and sympathetic remarks in reference to the class of design, will long be remembered by all who heard them. While mentioning Mr. Aston Webb's name, I cannot refrain from referring to the well-deserved honour bestowed upon him by the Royal Academy. No election made by that body has ever been more popular in the ranks of the A.A. than that of our past president and warm supporter, Mr. Aston Webb, and no congratulations offered to him are more sincere and hearty than those offered by the members of our body. I hope that

The Work of the Present Session

will be opened in a similar manner, and I am glad to be able to state that Mr. Ricardo and Mr. Seth-Smith have kindly consented to give us their help on Tuesday next, October 10th, by short, practical, descriptive addresses. While referring to the studio work, which has been so thoroughly and ably carried forward by Mr. W. G. B. Lewis, assisted by Mr. De Gruchy, I must commend to the notice of students the admirable system of time sketches started during the last session by Mr. Lewis. These sketch designs, made under the direct supervision of the instructor, will be found most valuable, especially to younger students. The system will help in giving them method in their earliest attempts at design, and so render their future efforts in design more direct and effective. Encouraging as the students' work in the studio has been, there is room for improvement. The danger of working with no higher aim than to make drawings sufficiently good for qualification in the R.I.B.A. examinations or for admission to the R.A. is a real one; and the falling off in the attendance towards the end of the session shows a lack of appreciation on the part of some students of the greatness of the work that lies before them, and of the necessity of thoroughness and methodical perseverance in their studies. Another branch of

The Studio Work

that is not receiving the support of students in a manner which the importance of the subject demands, is the modelling class. This is all the more extraordinary, as we still retain the valuable services of our old friend, Mr. F. W. Pomeroy as instructor, who, as I said when addressing you last year, is second to none in his art. I will not again repeat the sentiments I previously expressed as to the immense value of modelling to the architect. It needs no further argument on my part to justify its value in the eyes of all true artists in our ranks. But the committee have, as usual, gone to the root of the matter, and recognising that the argument of £ s. d. is found to be the most clinching of any, have decided to reduce the fees for the modelling class for students attending the studio to less than one-half the original fee, while any other member of the Association can now obtain the best instruction in modelling at the nominal fee of 12s. 6d. Surely a valuable class such as this will not languish in future for members. With regard to the lectures, I am glad to say that the average attendance has been well



DESIGN FOR A COUNTRY HOUSE BY RUPERT C. AUSTIN ("TRY.")

maintained, and that we are fortunate in retaining the valuable services of our many able instructors. In concluding my remarks upon the practical part of the work of the last session, I perhaps ought to mention the fact that

The Land Surveying and Levelling Class

was not held, owing to the small number of entries. But considering the multifarious subjects the architectural student has to face nowadays, one is not surprised that this practical subject of land surveying should, in some sessions, not receive the support it deserves. It must, however, be evident that to a large number of architects a knowledge of the subject is most useful, if not essential. An excellent new level has been purchased for the use of future members of this class. With regard to other useful branches of work, I should like to call attention to that of the Camera Club. It was decided last session to commence a really useful collection of lantern slides of architectural subjects, which would not only be useful to lecturers, but also to readers of papers in illustrating their subjects. Now, any members of the A.A. who are amateur photographers can help us greatly, by either sending to the secretary of

The Camera Club

any good negatives they may have of ancient buildings or of architectural detail; or still better, by sending lantern slides already made. We are anxious that the collection shall be very comprehensive in character, and at the same time good in quality. All negatives or slides sent will go before a sub-committee for careful selection. The great value of such a collection will at once be apparent to any who have had experience in the difficulty of obtaining suitable slides to illustrate papers on art generally and architecture in particular. It will be noticed in the Brown Book that certain alterations have been made with regard to prizes. Medals will not be quite so common as before, and will consequently, perhaps, be more valued, and a larger number of book prizes will be offered. I must call attention to the fact that for some years there has been no competition for the prize of £10 10s., kindly offered by the Architectural Union Company, for the best set of measured drawings. This prize used to be competed for regularly, and the reason for its being neglected now is quite incomprehensible to myself and others. The Architectural Union Company do not offer this valuable prize just for the fun of the thing, we may be sure, and we cannot, therefore, be surprised if the offer of a prize is withdrawn should no competitors be found during the coming session. I do hope I have only thus to bring the matter to the notice of students to secure a good competition in future.

(To be continued.)

BUILDERS' JOURNAL COMPETITION.

DESIGN BY "TRY."

THE following is the description which accompanied the designs submitted in connection with our recent competition by Mr. Rupert C. Austin ("Try"), and which are illustrated in our centre plates:—

The chief difficulties met with in arranging the required accommodation were as follows: Restricted limit of frontage; larger accommodation required on first floor than on ground floor; and the necessity for all best rooms to face north on account of the view.

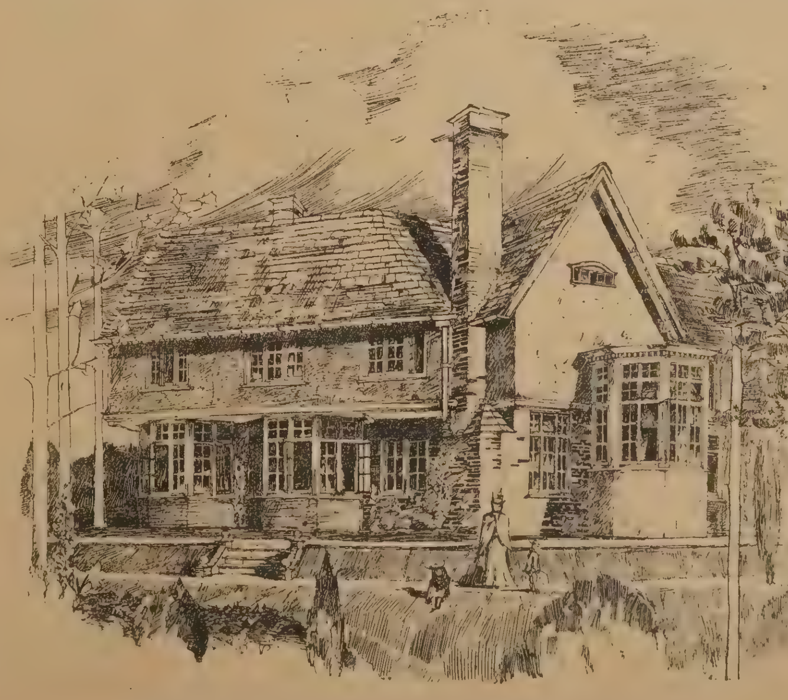
These difficulties were met as far as possible in the following way: The limited frontage was overcome by skewing the boudoir and study wing at an angle of forty-five degrees to the main front, thus avoiding the hillock and sudden drop at the south-east corner of the site; at the same time an excellent view is secured from the study and boudoir, and also a sunny aspect for the latter room. Larger accommodation required on first floor than on ground floor. The necessity for providing nine bedrooms on the first floor without having recourse to attics has proved to be a difficult task, especially as the required gallery running round the hall necessitates an open roof, hence loss of available space; it was found necessary to somewhat sacrifice the dimensions of some of the rooms in order to obtain the requisite number, but it is very desirable that one room at least should be dispensed with entirely, if not two. The necessity for best rooms to face north materially influences the plan, as it is most desirable that the best rooms should command the view. The bedrooms over the boudoir wing are carried out over the bay windows on the ground floor in order to provide a requisite amount of floor space.

General Description.

The front door faces as nearly south as possible, and leads into a vestibule, with lavatory and w.c. on the left and boudoir on the right. The vestibule opens directly into the hall, which is treated as a billiard-room, and also forms the general sitting-room for the house; a cosy corner at the right hand side on entering commands the view, and is also intended to be used for a raised lounge or dais while the billiard table is in use. The staircase is carried up in the large bay window opposite the door from the vestibule; a gallery landing is formed 8ft. 6in. above the ground floor level; from this a flight of five steps leads to the main gallery, which gives access at both ends to the corridors leading to the bedrooms. Off the main hall is situated on the right the study, and on the left the dining-room, with doors of communication opening off the hall; the dining-room also communicates with the corridor which leads to the servants' quarters. From this corridor access is obtained to the pantry opposite the dining-room, the back staircase, boots, storeroom, larder, scullery, kitchen, and servants' hall, and also a direct way to the covered verandah leading to the yard, w.c., and fuel place. The kitchen wing is entirely shut off from the house by means of a door from the hall and also by swing doors in the corridor.

First Floor.

The main staircase from the hall leads to the gallery; the ceiling of the hall is carried up open through the two storeys. The walls are plastered, except where panelling occurs. The roof is ceiled at the top side of the collar beam, and plastered to the upper side of the rafters, all visible timber—namely, trusses, common rafters, panelling, doors, mantel, staircases, &c.—to be of painted deal. Over



DESIGN FOR A COUNTRY HOUSE BY RUPERT C. AUSTIN ("TRY.")

the boudoir wing the two largest bedrooms are situated, one of which has a bathroom and the other a dressing-room in direct communication; the second bathroom and linen-room are also in this wing. Off the gallery opens one bedroom. The main corridor gives access to two fair-sized bedrooms; off a lobby is the w.c., housemaid's sink, and broom cupboard. Close to the back staircase is a door in the corridor which entirely cuts off the servants' wing from the rest of the house; in this wing are two good bedrooms and one small room, forming a total of nine bedrooms in all and one dressing-room.

Outside.

The ground floor and chimneys are to be built of red facing bricks, walls plastered inside, the first floor outer walls to be timber and brick nogging, the outer face to be covered with rough cast, inside walls to be plastered same as ground floor. The roof is to be covered with red tiles. All bay windows to be timber and brick nogging, covered with rough cast where shown on the drawings. Wood block flooring to be used in the hall, tiles in the vestibule, w.c., &c., boarded floors in the dining-room, study, boudoir, bedrooms, kitchen, and servants' hall, boots and store-room, cement floors in scullery and offices.

Correspondence.

"THE FINEST TRADE JOURNAL."

To the Editor of The Builders' Journal.

Burnham.

Dear Sir,—I have purchased your journal from its commencement, and noted with great pleasure and profit its gradual development to what it now is, "the finest trade journal in the kingdom." It is a great boon to country builders of limited means who are remote from centres of civilisation, it brings us into touch with larger men and ideas, and gives us courage to go on in our endeavours to give our customers honest work, notwithstanding that we sometimes have to compete with unscrupulous men in our own line.

I hope your new venture (which I have ordered) will be as successful as your former ones, and that it will deal liberally with the higher branches of the trades, especially joiners' work, which is, in the country at all events, almost an extinct art.—With all good wishes, yours truly, W. J. P.

[We are obliged to our correspondent for his encouraging expressions of appreciation. The first number of our new journal, The Furnisher, is now ready, and judging from the comments that have already reached us it is likely to be as widely appreciated as the Builders' Journal and Architectural Record.—Ed.]

DESIGN FOR A CHURCH AT SOUTHEND.

To the Editor of The Builders' Journal.

10, Basinghall Street, E.C.

Dear Sir,—My attention has been called to a perspective view in your paper of June 21st, 1899, called "Design for Presbyterian Church, Southend." I confess I was somewhat surprised to see it, for the Presbyterian Church at Southend had been built under me, and was opened complete more than a year before the above-mentioned "design" appeared. My surprise was increased by the fact that I had never heard of the name of the designer or of any other architect in connection with this church, for which I prepared the plans and superintended the execution.—Yours faithfully, THOMAS ARNOLD.

[We publish Mr. Arnold's letter in order to avoid any possible misapprehension as to the authorship of the design which was actually carried out. The author of the design which we published—Mr. John C. T. Murray—thus explains the circumstances of its origin:—"At the time the building of this church was being promoted I was asked by the gentleman principally interested in the scheme to submit a sketch plan and design, and I understood at the time one or two other designs were under his consideration. I believe Mr. Arnold's was decided upon."—Ed.]

WORKMEN'S DWELLINGS AT CLAYGATE.

THE ETIQUETTE OF CRITICISM.

To the Editor of The Builders' Journal.

London, W.

Dear Sir,—In your issue of last Wednesday's date there was a somewhat voluminous correspondence, criticising a small drawing of proposed workmen's dwellings at Claygate.

May I be allowed to touch upon one point in these criticisms? One gentleman accompanied his criticism with a plan, showing what he thought was a more reasonable scheme, which point I will not enter upon.

This system of criticism, however, appears to be a growing habit, as, but a little while ago, a plan in one of the professional journals was similarly criticised, and it appears to me to be a matter of most questionable taste.

The professional journals now lie in nearly all public libraries, and it is very possible the client may see these criticisms and be prejudiced against his professional adviser thereby. Taking such to be the case, I am sure the author of the criticism could only come to the one conclusion—that he had been guilty of most unkind and unprofessional conduct.

Lastly, in those criticisms one has, as a rule, so little guarantee that the author of the criticism is capable. Mr. Brett may be an expert in this subject, but his conclusion that a speculative client would be likely in a row of houses to extend his frontage for each block 10ft. 6in. and his depth 5ft. 6in., leads one to believe that he has had but little dealing with such clients, or only with those who possess most elastic sites. M. C.

IS OUR PRESENT SYSTEM OF EXAMINATIONS A FAILURE?

To the Editor of The Builders' Journal.

Staines.

Dear Sir,—The discussion in the above subject, inaugurated by "K." in your issue for Sept. 20th, is a really important one, seeing that entry into many of the better paid and "permanent" positions is through the door of a competitive examination. As is well known, the tendency is towards making these examinations stiffer and stiffer, and the cause of this stiffening is, primarily, the enormous and altogether disproportionate number of candidates for the comparatively few vacant posts thrown open to competition.

Theoretically, the examination system should be fairness itself, and should result in the best man winning the coveted post; but here, as in many other instances, practice knocks theory into the proverbial "cocked hat." Were all examinations conducted strictly in those subjects which the candidate would find useful in after life, or which would fit him the better to hold the position for which he is competing, little objection could be raised to the system notwithstanding the fact that, owing to nervousness or some other cause, the best man may not always win first place, or even may win no place at all; but when, as is the actual fact, the candidate has to submit to examination in subjects which are as remote from his future duties as the Greek Kalends, it cannot but be admitted that the present examination system is, in a large measure, a farce. It usually resolves itself into the case that the candidate who possesses the greatest amount of superficial cleverness, combined with a good memory and a capacity for "cramming," outreaches the solid, painstaking student, who, in a general sense, may be, and frequently is, the more worthy man of the two.

So much for competitive examinations in general. Coming now to the question of purely technical examinations, we find the state of affairs, if anything, a shade worse. It is a fact beyond dispute that some of the examiners in the building-trade subjects are men, who if set to answer the questions propounded by them would fail, and fail miserably, to satisfy any thoroughly practical examiner of their fitness to be considered as capable instructors in those arts or crafts of which they are supposed to be shining lights, and in the practical exposition of which they might be expected to be reasonably efficient. This is a strong assertion, but it is perfectly true; and if asked why these things should be, I can only reply that the man of superficial cleverness, who is able and usually not averse to blowing his own trumpet with considerable gusto, fancies himself, and, to some extent, persuades others to fancy him as one of the leading exponents of his particular art or craft.

In technical subjects naturally, the student has to rely largely upon text-books, and taking text-books and craft manuals as a whole one is bound to admit that for the most part they contain but one small halfpennyworth of bread to an intolerable deal of sack! The man that is thoroughly practical in his craft or profession, and combines therewith a considerable amount of literary ability, is a *rara avis*, consequently a text-books is frequently either so mistly worded as to convey no true impression of the author's meaning, or it is mainly a compilation of other and older text-books which are out-of-date and otherwise technically defective. Examiners in technical subjects are, not unnaturally, largely drawn from the class of men who have achieved some notoriety from the publication of an exhaustive (?) text-books, and it follows as a matter of course that the answers of candidates must be based upon text-books if the coveted certificate is to be won; and it is by reason of these very facts that certificates are not more largely prized in the workshop, where their holder is more often than not treated as an object of derision or looked down upon as merely a theoretical chap who considers himself a notch above his mates.

That the present system of examination is more or less of a failure is an undoubted fact. Only in a small measure does it accomplish its aim and end, for in no way do examinations as at present conducted tend towards the survival of the fittest among the examined. If the range of study were confined to fewer channels and the subjects of examination brought down to the basis of practical every-day utility, the plodding, painstaking, practical man might have a chance. Technical education and examinations in general are conducted too much on the present-day School Board style, by which the pupil often gets "a smattering of everything and a sufficiency of nothing." This should be seen to before its evil effects become more pronounced.

TECHNIQUE.

Military Memorial for Canterbury Cathedral.—A monument is to be erected in the nave of Canterbury Cathedral in memory of officers, non-commissioned officers, and privates of the 1st Battalion of the Buffs (East Kent Regiment) who were killed in action or died of wounds or disease in the Chitral and Punjab frontier campaign from 1895 to 1898. The monument is being erected by the comrades of the deceased.

The Hotel de l'Europe, in Leicester Square, was opened recently. Mr. T. Walter L. Emden, the architect, has introduced a continental feature, namely, the Brasserie, which is in German Renaissance style. A fine effect is obtained at night by the electric lamps, which represent fruit half hidden in the festoons of leaves and flowers, in repoussé, hanging from the beams and columns. In the base is a lager-beer hall, and on the first floor is an Italian Renaissance room, to be used as an à la carte restaurant, which is adjoined by a reception chamber, in Louis XVI. style.

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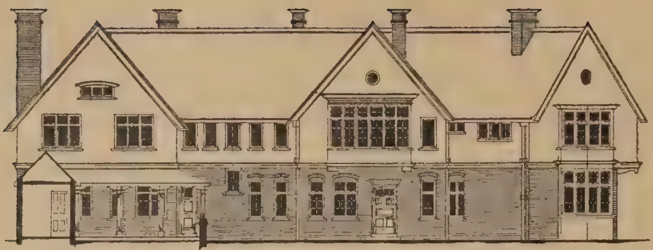
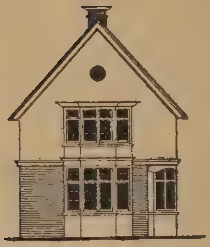
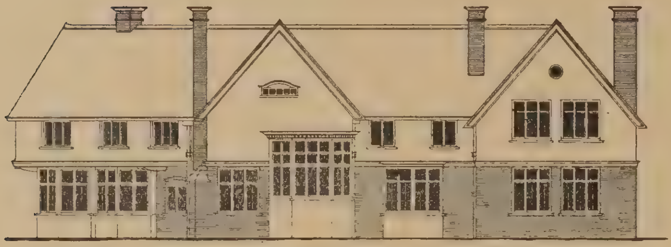


South Front



East Elevation



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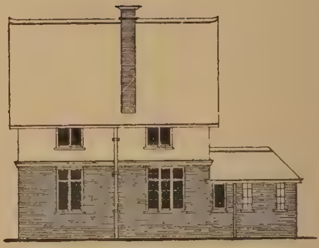
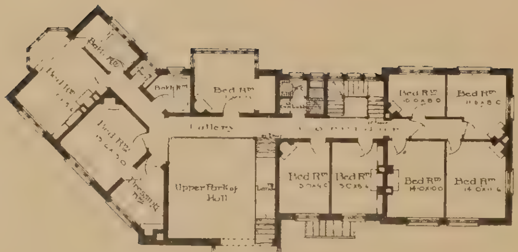
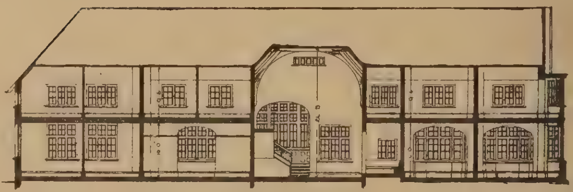


West Elevation

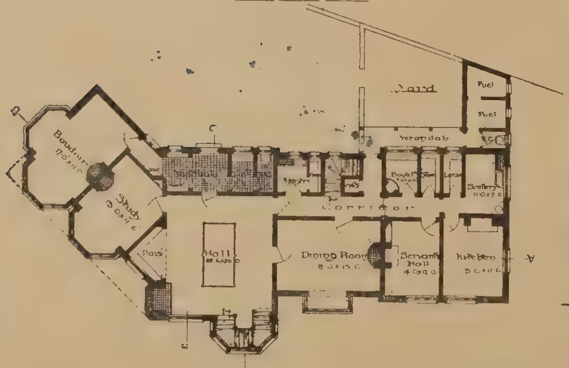
Scale of Feet



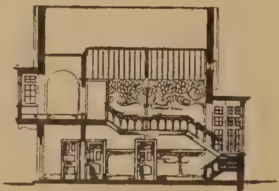
First Floor Plan



Section AB



Ground Plan



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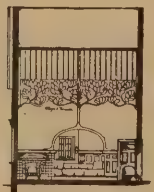

Section EF

Scale of Feet

BUILDERS' JOURNAL COMPETITION. DESIGN BY RUPERT C. AUSTIN ("TRY"). HIGHLY COMMENDED.

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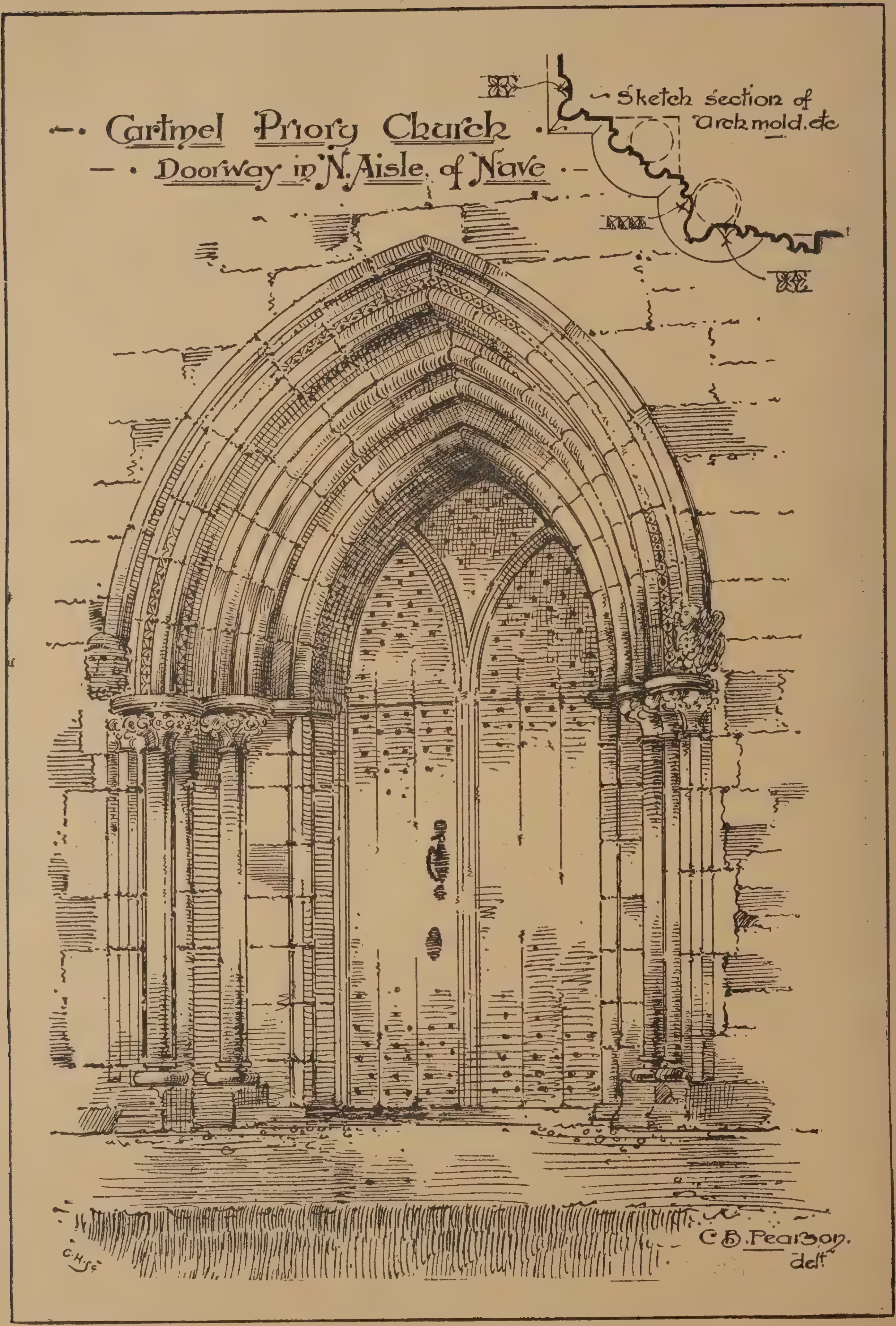
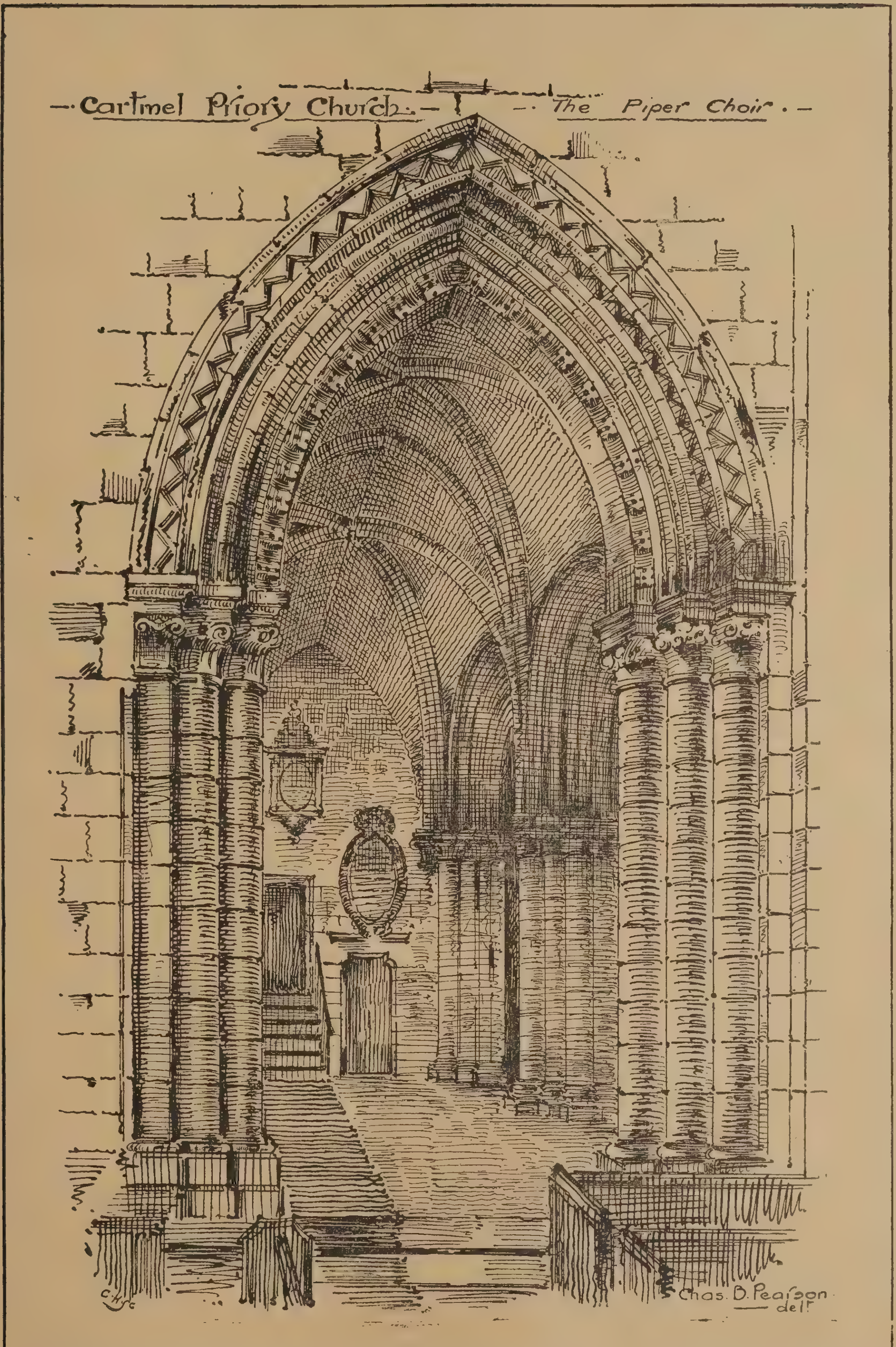

Cartmel Priory Church
Doorway in N. Aisle of Nave
Sketch section of Arch mold. etc
C. B. Pearson. delt
C.H.S c

Drawn by C. B. Pearson.



Drawn by C. B. Pearson.

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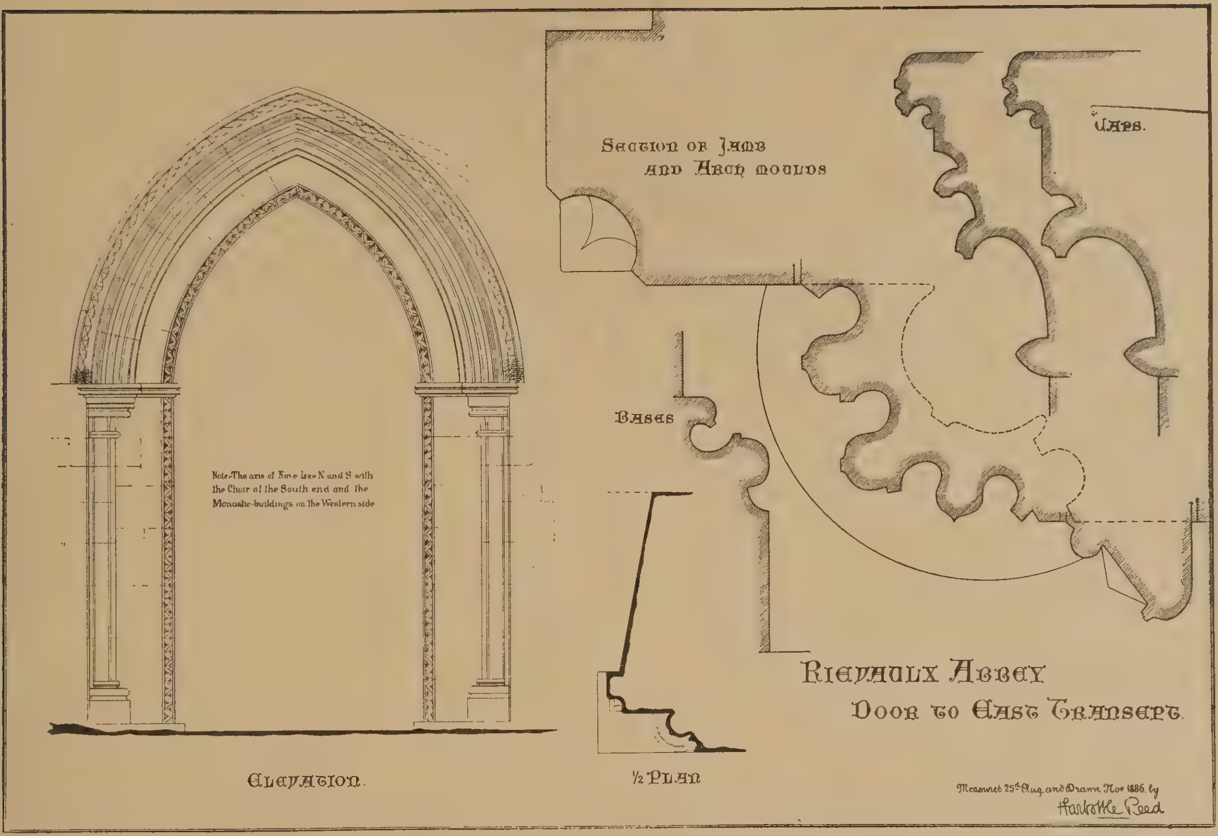
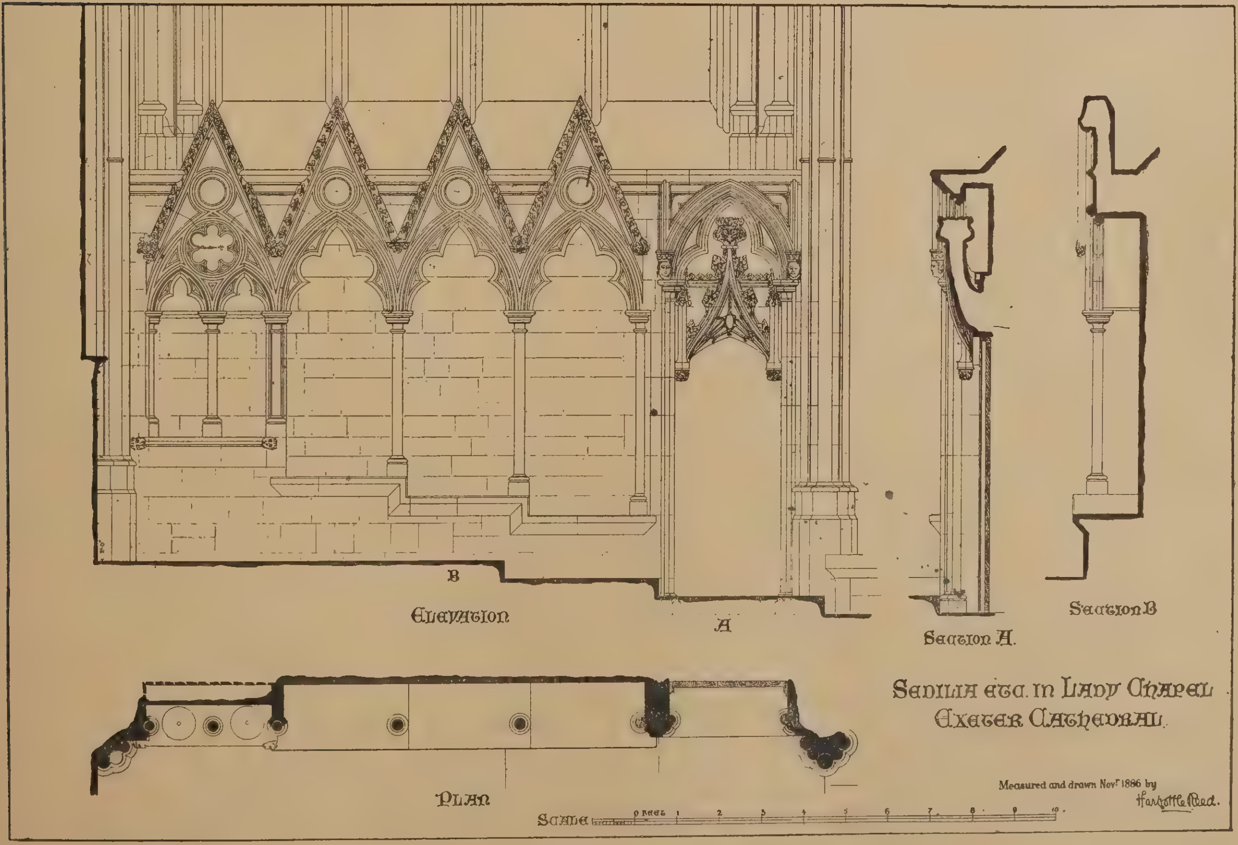

Section of Jamb
and Arch moulds
Caps.
Bases
Note-The axis of Nave lies N and S with the Choir at the South end and the Monastic-buildings on the Western side
Rievaulx Abbey
Door to East Transept.
Elevation.
½ Plan
Measured 25th Aug. and Drawn Nov 1886, by
Harbottle Reed



Measured and Drawn by Harbottle Reed.

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BRITISH PLASTERWORK, PAST AND FUTURE.*

By GEO. P. BANKART.

PLASTERWORK is an art (or was so) as well as a craft, and that quality which raises it *into* an art is the very one that escapes our analysis. Art came and grew with man's intellect, craftsmanship with his knowledge of things. In the past art and craftsmanship were united, and worked in the common cause. At present craftsmanship has strangled art, and become utilitarian only, in the vulgar sense of the word, but is combined with science. It would be well could all three join hands again—as they must do eventually—for they have a wide field in front of them, and Art should in its proper function take the lead, not so much by being talked about as by being practised. We require more workers and less talkers if anythink is to come of it. We want fact more than theory. We must hold it as a duty of industry to examine the past and the present, and also to think of those who are to come after us, as we may hope that they may look back on us.

In this paper I will give a few plain facts concerning the past history of plasterwork, and also state a few facts concerning the future, which facts cannot be evaded if we are again to have a national art of plastering of any worth. I must therefore be concise and deal chiefly with the work which forms so interesting a feature in the decoration of British houses of the sixteenth and seventeenth centuries.

This work forms itself readily into two chief divisions; the one, "stucco-duro," the chief basis of which is carbonate of lime; the other, plaster of Paris or sulphate of lime. We have it on the best authority that the former, the art of working in

Stucco

or "stucco-duro," was much practised by the ancients; but it is still uncertain whether it was practised by the Greeks. Judging from the Greek character of the early Roman work, one may be strongly inclined to think that they did employ it. To the fifteenth century, however, we must refer to see how our own country was more directly influenced by its rivival. During the long interval which elapsed between the downfall of the Roman Empire and the Renaissance of art, stucco working became almost a lost art; yet not entirely so, for it worked Eastward like the Roman power influencing the art of Arabia and India.

Morto-da-Feltro, so named because of his morbid nature and subterranean investigations for ancient examples, rediscovered this material in the latter part of the fifteenth century, and the revival of the art of working it followed the Renaissance of art at a little later period through the partial exhumation of the Baths of Titus by the orders of Cardinal Giovanni di Medici. The Renaissance was matured on the search for specimens of the antique arts, so also was the revival of Stucco working. Raphael and his assistant, Giovanni-da-Udine, were particularly interested and impressed by these discoveries and the extreme delicacy and beauty of the modelling on the Walls. Giovanni immediately set to work experimenting in the reproduction of the method, the result being practically the same as the composition described by Vitruvius, *i.e.*, lime of the best quality, tempered for a long time before being used, chopped from time to time with a heavy hatchet, and well beaten with heavy sticks. It was usually laid on in three coats, or as many coats as the nature of the work required. The first coat was of rough stuff containing broken marble, forming the wall covering. The second coat was of finer stuff, forming the background, upon which the design was worked. The third and the finishing coat was a mixture of lime and very fine marble dust for the modelling, which, when dry, was polished with marble dust and chalk.

This modelling coat was toughened and regulated in its setting qualities, so that it might be worked upon for some days together by such ingredients as rye-dough, juice of figs, curdled milk, hog's lard, and blood. With such a composition, modelling of unrivalled excellence and beauty was executed with readiness and ease, the aim being to attain the hardness and whiteness of the stucco used by the ancients.

Giovanni's success was great, and Raphael handed over to him the decoration of the Loggie of the Vatican, followed by the Villa Maddonna, and Raphael's own house, which was treated externally as well as internally. This was enough to establish

The new Art

which spread with great rapidity in the capitol until the fall of Rome, whence it was carried to Venice by Sansovino, who, with the assistance of the designer, Alessandro Vittorio, executed much fine work, the Scala d'oro, in the Ducal Palace, being, perhaps, one of the best known examples. In 1524 it reached Mantua, where a most important school was founded. Here Primaticcio, a young artist of great inventive power, worked in stucco with such success that his fame reached François I. of France, who employed him at Fontainebleau. This is an important point in our history, for having thus found its way into France, Henry VIII. of England, the great rival of François in all things, would not rest until he had imported the art into England. He invited numbers of Italian artists, architects, and sculptors into this country to the death of our traditions, our trade guilds, and our architecture, which was at that time the resultant of the crafts in combination, in association. The national folk lore architecture was crushed out, the traditions lost, and the imitation of the Roman fashion of building, like Roman law, became universal throughout Europe.

Henry VIII. set his Italian craftsmen to work on the erection of the wonderful palace of "Nonesuch," but, unfortunately, no trace of this building remains to us at the present day, and we have only vague descriptions of its appearance. It is said to have been commenced about 1527, and to have had "a double quadrangular plan, with lofty pavilions at the angles, and elaborate porches, salient bays on its sides, a great clock tower, and was guarded by a gatehouse." It was built, according to the custom of country houses at that period, of framed timber work, and was thus especially adapted for the display of the new art. This idea was immediately seized upon by the Italians, the principal of whom appears to have been one named Toto-del-Nemziata. Thus each panel of the timber framing of this great palace became filled with a coloured stucco figure.

The introduction of this great art into England is assigned to Toto-del-Nemziata and his fellow workers, who were the "advance guard" of a continuous stream of Italian craftsman, who carried on the work in this country until the commencement of the eighteenth century. These men trained up a school of English craftsmen, who rapidly propagated the knowledge and practice of the new art throughout the country.

During the Parliamentary wars the palace of "Nonesuch" was stripped of its lead and otherwise despoiled. Pepys, who saw it in 1665, says: "all the house on the outside was filled with figures of stories and good paintings." This new fashion set by the king at "Nonesuch," prevailed during the latter part of the sixteenth century, and throughout the seventeenth century few houses or mansions were erected in England that did not employ the art of the stucco worker, internally and externally.

In 1547 Charles Williams is mentioned as an English stucco-worker of renown. He had travelled in Italy, and may probably have done work at "Nonesuch" palace. About this time he offered his services to Sir John Thynn in supplying internal decorations "after the Italian fashion" at Longleat House, which Sir John had then just commenced building.

"Bess of Hardwick" and Sir William Cavendish were also building the old Hall at Hardwick, in Derbyshire (now in ruins), and wrote to Sir John Thynn requesting the use of this "cunning playsterer," who they were told had made "dyvers pendants and other pretty things, and had flowered the Hall at Longleat." The frieze, part of which is now to be seen on the ruined walls of the "Giants' Chamber" in the old hall at Hardwick, is most probably the work of this Charles Williams. In the New Hall, which was built between the years 1590 and 1597, is a freize 11ft. deep, representing a forest with human figures, plants, and animals, all modelled with metal tools, the distant hills being painted on the background. This frieze is probably the work of a school of craftsmen established by Charles Williams, and the modelling is perhaps less masterly in execution than the former, though a very wonderful piece of work all the same. When the New Hall was erected the old one was dismantled and the famous frieze considerably damaged, and it is wonderful that what is still left is as fresh and perfect as when just finished, the tool marks being distinctly visible on its surface in spite of exposure to atmospheric changes of all kinds for so long a period.

These two pieces of work are probably the best examples in this country showing the possibilities of the Italian "stucco-duro" material that we have the good fortune to inherit, and they should be carefully studied by all students of this art.

The Italian character did not exist long in the hands of English craftsmen. The materials were expensive and difficult to procure, and "stucco-duro" soon gave way to the modelling and stamping of the coarser plaster or "pargetry" that had always been used for their ordinary work. The word "pargetry" or "pargetting," now used by bricklayers for the coarse plastering of chimney flues, was originally plaster work of the period decorated by means of stamps or impressed patterns in the soft material, whether external or internal. Sometimes a combination of pressed work and hand modelling was done with very good results, and this is sometimes called "parget work."

The English plaster worker did not attempt to vie with the more artistically-educated Italian, but struck out for himself, forming a decoration of his own in no way based on the Italian method. In this decoration his chief characteristic is in the arrangement of formative panelling, rather than in figure modelling. Taking the perpendicular fan tracery as a basis, he founded and developed an arrangement of ribs and pendentives geometrically set with great intricacy. The Englishmen were not, like the Italians, trained in the disposition and modelling of the human figure, and more often than not the lowness of the rooms in our English homes required less ambitious treatment than the vast halls of the more sunny southern countries. These early attempts of the newly-founded English School were mostly confined to patterns of small area which would repeat with ease.

(To be continued.)

New Club Premises for Hull.—Mr. B. S. Jacobs, architect, of Lincoln's Inn Buildings, Bowlalley Lane, Hull, has accepted, on behalf of the "Pacific Club," Limited, the tender of Mr. W. Sanderson, builder, Temple Street, Beverley Road, Hull, at a sum of between £5,000 and £6,000, for the building of a new club, restaurant, &c., in the High Street, Hull. This club was formed by a few of the principal corn merchants a few years ago, and it has so increased its membership and out-grown the accommodation that they decided to build new premises. The ground plan is designed as an exchange, with a large centre room having side adjuncts. A row of arches on each side support, the upper rooms forming the restaurant. Skylights on each side light the ground floor.

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* A paper read before the Leeds and Yorkshire Society of Architects; redelivered to the Leicester and Leicestershire Society of Architects.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"The grandest productions of architecture are not so much individual as social works, rather the offspring of nations in labour than the inventions of genius; the deposit left by a people; the accumulations formed by ages; the residuum of the successive evaporations of human society—in short, a species of formations. Every wave of time superinduces its alluvion, every generation deposits its stratum upon the structure, every individual brings his stone. Such is the process of the beavers, such that of the bees, such that of men. The great emblem of architecture, Babel, is a bee-hive."—VICTOR HUGO.

A Great Canal. A REPORT has recently been circulated that the Russian Government intend to build a canal from the Black Sea to the Baltic for strategic purposes. A cursory glance at the map will show that this is indeed a huge scheme. Though it is denied that such a proposal is on foot, it is admitted that influential men have endorsed it, and the denial does not extend beyond the time necessary to complete the network of European and Asiatic railways which Russia is pushing forward with all speed. In short, this new scheme cannot really be practically adopted until the Russian railways begin to pay. Russia intends to strike wherever and whenever she can at the British carrying trade, and this canal (were it ever completed) would no doubt create grave complications is more ways than one. One writer says that Russia's initial blows may seem light and almost unsuspicious, but she is merely reserving her shattering force till she is socially, politically, and financially strong enough to wield it. The canal is estimated to cost at the very least 150,000,000 of roubles.

Statues on Mountains. ITALY has lately developed a peculiar taste for placing statues on mountain peaks, where only the hardy ones are ever likely to see them. If a scheme which is now being entertained of commemorating the "Holy Year" is carried out, Italy's mountains will be well decorated. It is the intention of a special committee just formed to erect nineteen statues of Christ, one for each century since the birth of the Christain era, on high mountain peaks in different parts of the Peninsula. The statues will all be of colossal size in gilded iron, and will be illuminated at night. The marble pedestals will bear inscriptions stating the purpose of the statues. It is proposed to have three overlooking the frontier of France, three overlooking Switzerland, and three on the Austrian frontier; one above the village of Porretta in the Apennines between Bologna and Florence; one on Mount Soratte, the highest peak near Rome, celebrated through the description of a sunrise seen from there by Horace; another on the Gran Sasso d' Italia (Great Stone of Italy), in the centre of the Abruzzi, whence can be seen the three seas surrounding the Peninsula; and another on Mount Altino, near Gaeta, dominating the magnificent Gulfs, of Gaeta, Naples and Salerno. Three will be raised in the extreme south, one among the hills of Calabria in the "toe," another in the "heel," and the third in the "instep" of the "boot," two in Sicily, and one in Sardinia.

Giants' Graves. IN the neighbourhood of Portadown, on the lands of Major Boyd Bredon, at Ballinteggart, what have been popularly known as the "giants' graves" have been excavated, measured, sketched, and photographed. This is not the first time the graves have been investigated, as at least twice during the last two centuries have they been opened. It was not expected that much of interest would be found. The graves are surrounded by an oval fence of stone and earth, and consist of four connected chambers, measuring together about 34ft. lengthwise. In one of these chambers was found a rude tiling of flat stones and a deposit of charcoal, which seems to point to incineration rather than interment as the mode of sepulture.

The Royal Sepulchre. THE royal sepulchre beneath St. George's Chapel and the Albert Memorial at Windsor is being considerably improved. It was constructed by George III. The vaulted roof is supported by massive octagonal columns, which support the ranges of stone shelves upon which the coffins are placed; there are also stone tables, a foot high, for the same purpose, at the east end and in the centre. In order to obtain an entrance to the mausoleum it has, until now, been necessary to remove heavy iron plates, which guard and seal the stone stairway to the vault. At the entrance to the vault, which is at the east end of St. George's Chapel, an arched doorway is to be put up, and electric lights have been installed. Several of the coffins are being shifted, and a fine marble altar is to be erected at the east end of the vault. These alterations are being carried out under the personal supervision of Mr. A. Y. Nutt, of the Office of Works; Messrs. Wheeler, of Reading, being the contractor.

A Word About Technical Education. SOME good advice was given with regard to technical education by Sir Andrew Noble at the recent opening of the winter session at the City and Guilds of London Institute Central Technical College. Technical education, he said, was of the highest importance, and it was only its abuse that had to be guarded against. One of the greatest abuses was beginning technical education too early in life, by which a boy put his knowledge to practical use before he had learnt how to learn. Another abuse was the divorce of practice from theory and the danger of raising practical application above scientific knowledge. In nine cases out of ten any knowledge acquired by a boy before he was sixteen years of age could have but a slight intrinsic value. Up to that age it was not what he learned that they had to look at but how he learned. It was discipline, self application, and power in attacking a subject that were so valuable, and not generally any definite piece of knowledge he might have gained. Sir John Noble said he was in accord with those who thought the modern languages should supersede the classics as a means of education. In his judgment a boy should not begin seriously studying for his profession earlier than seventeen or eighteen. Referring to foreign competition and methods of study, he said that nearly every requirement in a drawing office could now be better and more economically obtained from Germany. The English mechanic must look chiefly to theoretic and technical knowledge. All German improvements he felt inclined to attribute not, with Sir William Harcourt, to any linguistic superiority, but to the far greater opportunities of technical study afforded in that country.

A Delegate's Amusing Report. THERE was an amusing episode at the last meeting of the Strand District Board of Works. Mr. G. Rees was responsible for it. He had attended the conference of the Sanitary Institute on behalf of the Board, and came to deliver his report. He disposed of this business very briefly by saying that a great many matters of importance were discussed. One matter, however, had not been discussed which ought to have been. He did not know whether his fellow-members had suffered, as he had done, from the intolerable plague of flies which had existed during the past summer. (Cries of "Yes" from several bald-headed gentlemen.) He believed they were a source of disease, as well as a nuisance. They settled on noxious matter in the streets, and then flew into the house and settled in hundreds on the food on the table. Something ought really to be done in the matter. A Member: Does Mr. Rees suggest any remedy against a nuisance? (Laughter.) Mr. Rees said he couldn't, but simply pointed out the plague. A Member: But what can we do? Mr. Walter Emden, L.C.C. (chairman): Order, order. The gentleman must call in a policeman if he has a repetition of such conduct in future. (Roars of laughter.)—The report was then adopted.

A New Requirement. OF late years a fierce invasion has been made by the fair sex of many kinds of employment hitherto exclusively enjoyed by men, and the (so-called) "new woman" has become a fixture. Attacks were first made on men's clothing, and then, gathering strength and confidence from familiarity, the ladies assailed the professions. There was the lady doctor, the lady preacher, the lady architect, and the lady sanitary inspector. From professions, woman went to trades—witness the lady barber, the lady bookbinder, the lady decorator, etc.—and finally gave the crushing blow when she became a "sportsman." All these things have a serious as well as a ludicrous side. Here is a case in point. The Richmond Board of Guardians propose to build a new infirmary and have been in correspondence with the Local Government Board with reference to the plans. At a recent meeting a letter was read from the Board, asking, "Where are the nurses' bicycles to be kept?" The architect, poor man, had not anticipated such a requirement, and admitted that no provision had been made for the nurses' machines. He is only human after all. If nurses are to have special buildings put up to accommodate their bicycles, why shouldn't men have a well-ventilated central repository in which their pipes might be kept? Perhaps the authorities at Whitehall could answer the question.

Irish Marble. AMONGST the many great natural sources of wealth in Ireland, says the "Philadelphia Standard," are her rich and varied marble deposits. During the past year nearly one million dollars' worth of Irish marble, quarried within a few miles of Galway, has been imported into the United States for the decoration of fine public and private buildings. A lavish use has been made of it in the Columbia University buildings, and in the new university club house, Fifth Avenue, New York. In the club house the grand hall is supported by eighteen columns and pilasters of this marble in serpentine and green shades, highly polished and carved in the Celtic school of ornamentation. These columns are 36ft. high and 3½ft. in diameter. This marble was discovered more than a century ago, but the expense of quarrying and hauling it to tide water militated against its use. The late Eugene Kelly, the New York banker, was induced to use a small quantity of it in an office building which he erected shortly before his death, where its beauty appealed to a number of architects, who began to use it. About two years ago a syndicate of Irish-American quarrymen leased the quarry and introduced Sullivan's patent American machinery for quarrying and dressing it at less than one-fifth the cost of the old hand process, and the low prices resulting from the new methods have created a large market for it. A great deal of it is to be used in the new Catholic Cathedral in London and in the Sacred Heart Basilica at Paris.

The "Saracen's Head." Nos. 6 and 7, Aldgate High Street, are, on the authority of Mr. Philip Norman, F.S.A., the last remaining portion of the "Saracen's Head," a well-known coaching house, the history of which goes as far back as 1681. There was until recently another house forming part of the inn, but it has been demolished. The name of the inn was discernible on the front of these houses until a few years ago. Behind the buildings is a yard which was formerly that of the "Saracen's Head," and which was once galleried. The houses are the most picturesque remains of Old London in Aldgate. The fronts are timbered with carved pilasters treated with fruit and flowers. The rooms within, which number about eight in each house, are small and not remarkable save for a pretty little basket grate or two, and a few neat little chimney-pieces, all in the plain good taste of a middle-class house of the seventeenth century. The balustrade at the top rails in the leads, to which doors from the attic stories give access. The premises were sold recently on the death of the freeholder, but were repurchased by a member of his family, and these interesting and picturesque remains are not apparently immediately threatened with rebuilding.

Clerkenwell Parish Church. The Clerkenwell Parish Church was reopened last Wednesday, after its restoration and redecoration. The church is now lighted by electricity, the pews are cut down, the ceiling has been whitewashed, and the pillars have been freshly painted. St. James's, Clerkenwell is an old foundation, dating from about 1100, but the present church was built upon the site of the old one, which was so dilapidated that the Georgian Era despaired of it, and pulled it down in 1792. It was a substantially-built church, but the wear and tear of ninety years laid it open to restoration work in 1881, when Mr. Blomfield, besides recommending the repair of the outside of the church, suggested one or two constructive alterations inside. These were carried out, but only in part. Later decoration and restoration have suggested the removal of the old pulpit and the erection of a light lattice work screen of painted iron, which runs across the step leading up the chancel. The pulpit is now part of the screen.

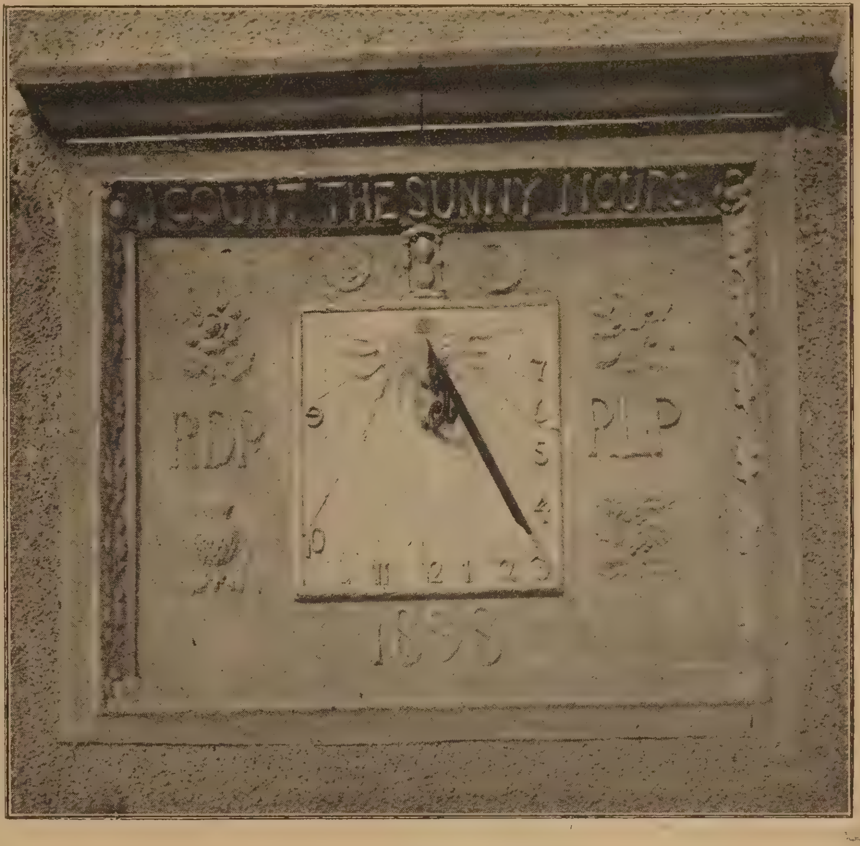
A Forgotten Tunnel. At a meeting of the Langbourn Ward Club, held last Wednesday evening at the London Tavern, Fenchurch Street, Mr. George Threlfall, a gentleman with a penchant for exploring, read a paper on the old underground pneumatic tube that runs from the General Post Office to Euston Station. The tube was built forty-two years ago for the purpose of conveying mails, parcels, &c., by pneumatic dispatch, but the old Pneumatic Dispatch Company, which was started in 1859, was compelled to cease working because it was found that the system of blowing, or sucking, the cars through the tunnel by air pressure, or vacuum was impracticable, owing to leakage of air and other mechanical defects. The tube was made of cast iron sections 1in. thick, and was 4ft. high by 4½ft. wide. It occurred to Mr. Threlfall that if the tube was available it might be used for its old purpose if worked by electric traction. He did not know the exact location of the tube, but after nearly three years' search for information he discovered its whereabouts, and explored it. His suggestion that it should be used for its old purpose, with electricity in the place of air, is a good one, and will, no doubt, be followed up.

Subterranean London. It certainly must have been a subject for conjecture to passers-by when about eighty gentlemen, most of whom were wearing the regulation frock coat and silk hat, emerged from an open grating at the corner of St. Bride Street, Ludgate Circus. These gentlemen were not beings from another world, but simply members of the City of London Tradesmen's Club, who had been personally conducted on a tour through the extensive subways which lie underneath Holborn Viaduct and adjacent thoroughfares. Passing into the subway by means of an entrance under the Viaduct itself, the visitors were conducted by Mr. Liberty, a city inspector of subways, along what appeared to be interminable passages, well ventilated and well lighted, with huge pipes on either side, the uses and capabilities of which were pointed out. The chief feature noted was that by means of these subways, the various companies can carry out their operations without disturbing the surface of the roadway. When it is remembered how the Strand and others of our principal thoroughfares, are broken up by one company after another, it is to be regretted that the system is not applied to the whole of the metropolis.

Views and Reviews.

EXHIBITION AT No. 9, MADDOX STREET.

The depôt just opened in Maddox Street deserves to be noticed, because there is little to be found in the place which is not more than ordinarily good of its kind. Exceptional works which have the stamp of individuality upon them are conceived and executed in very out-of-the-way places sometimes, and it has been felt that a central establishment to which things intended for sale might be sent would be nothing less than a blessing to their producers. You may do all the thinking which art work requires in the place of your birth, and may even be allowed to convert the one sitting-room into a workshop, but can you expect to be pardoned for all the mess that you make if nothing is sold after all? To live with such an accumulation of things made and unsold about one is, to say the least of it, dreary, and often we hear it said that if the *genius loci* only knew where to send them he would empty his place in a moment. (He must be sure of their worth, however.)



SUNDIAL. BY GEORGE P. BANKART.

Let this preamble be pardoned, and let it be said straight-away that a place of the kind we require has been opened. Mr. Fordham, though no longer residing in Birmingham, retains the closest connexion with the "handicrafts guild" of that city, and the nucleus of his collection consists of the work produced by this guild. The prospectus contains the names of some of the best known art workers of our generation, and the exhibition itself not a few of their works. There are things of all kinds, and few that are not commendable. Of Mr. Cockerell's book bindings there can be none more delightful than those he has here. It is unlikely that any surpasses the others as an example of the craft in which he excels, but the nature of the inspiration must be considered, and it is not everyday, I suppose, that treasured collections of letters in manuscript are placed in a bookbinder's hands. It is much to his credit that he has exercised so much reserve in this case, for when a volume is, so to say, sacred, we want to have it to ourselves, and not to have either the name or the work of the binder put foremost. Llewellyn Rathbone, working in Liverpool, sends such a selection as can be conveyed most easily. Of their excellence one need not speak here, for his is not a new name, and his works, not his friends, have established his reputation. Of Mr. H. Wilson's most exquisite jewelry what shall be said excepting that there appears to be nothing within the cycle of the fine arts that he has not essayed of late? Of the craft of speech a past-master, he supplied at short notice the few beautiful things that appear in the book of words for the Masque, recently performed at the Guildhall by members of the Art Workers' Guild, and has probably other surprises in store.

Miss May Morris sends needlework, a splendid embroidered cloth, designed, be it said, by her father, and shows us besides what art there may be in the threading of beads with a view to the effect they may have considered as part of the dress. The accompanying illustration is of a sun-dial. There is poetry in the mere idea of the thing, and it *must* be made beautiful if handled at all, for whoever created the luminant is the Judge of the Song of the Dial. I am told of this work that it is modelled on a bed of concrete, that the gnomon is bronze, and that the initials are those of the owner.

E. R.

A New Primitive Methodist Chapel at Wilsden, Yorks., is being erected, at a cost of £1,300, from designs by Mr. W. R. Nunns.

The Restoration of Wednesbury Parish Church is to be completed by providing a north transept at a cost of £800. Nearly £20,000 has been spent on the building during the last twenty years.

Projected Improvements at Bridlington.—It is stated that the Beaconsfield Estate is to be developed, and that an hotel providing accommodation for 200 guests, a theatre seating about 2,000 persons, and a promenade pier and concert pavilion, are proposed to be built.

Professional Practice.

Airntully.—A new church hall in connection with the Kinclaven Parish Church has just been formally opened. The hall is 31ft. by 17ft. inside, and has an entrance porch at the east end. The walls are framed wood resting on a stone foundation, and finished on the outer face with cement plaster and rough cast. The roof is covered with green slates, the gable projections having ornamental barge boards. The windows, eight in number, are glazed with cathedral glass. Sitting accommodation is provided for upwards of 100 persons, the seats being placed on each side of a centre passage, and there is a platform with a reading-desk at the west end. The ventilation is by hopper ventilators placed in windows, and by a shaft from the ceiling, connected to one of Boyle's air-pump ventilators placed at the apex of roof. The heating is by means of a slow combustion stove, and the hall is lighted by two 100 candle-power lamps hung from the ceiling. The contractors were:—Masons, Messrs. W. and C. Duncan, of Murthly; joiner, Mr. James Mitchell, of Murthly; slater and plumber, Mr. Neil Dow, of Murthly; painter, Mr. Henderson, of Birnam.

Birkenhead.—A new church has been erected in Manor Road, Liscard, at a cost of £5,000, from designs by Messrs. Ware and Rathbone, Dale Street, Liverpool, Mr. James Merritt, of Birkenhead, being the contractor. It is built of Ruabon bricks with white stone dressings, and seats 300 people. The electric light has been installed. Roughly speaking, the building consists of two rectangular halls, one, somewhat the larger, being the church proper, the other the church hall. The choir is separated from the nave by a simple central arch flanked by a smaller arch on each side. The choir stalls are of oak stained a dark green, with designs painted on the ends decoratively symbolic of the four elements—earth, air, fire, and water. The Communion table and the pulpit are also of wood, treated in the same sombre scheme of colour as the stalls, and relieved by figure decorations which supply a richly harmonious effect. The artist who executed these painted decorations is Mr. Bernard Sleigh, of the Bromsgrove Guild of Arts and Crafts. The lectern is constructed of wood and adorned with a conventional palm leaf ornament in beaten copper. This, with the electroliers that hang from the ceiling of the church, is the work of Mr. Walter Gilbert and other artists. The wall at the back of the choir is furnished with a kind of reredos of wood, stained brown, a colour which presents an agreeable alternation to the green of the woodwork in the choir. Above the cornice are six large panels of Della Robbia ware, executed by Mr. Harold Rathbone. At the base of the tower there are four figures carved in stone by Mr. B. Creswick, of Birmingham, typifying Meditation, Eloquence, Devotion, and Music.

Birmingham.—At the end of this month the new Police Institute, at the corner of Dalton Street and James Watt Street, will be opened. It has been the aim of the architects (Messrs. Ingall and Son, of Temple Row) to get the best view from Corporation Street, and in this they have been successful. The building is erected in red brick with terra-cotta dressings. In the basement there is a gymnasium about 50ft. by 27ft., to the right of which is a recreation room. Immediately above is the apartment which is to be used as a reading room and library. The centre of the pile is surmounted by a dome and flagstaff, running to a height of 100ft. from the ground. One of the chief features of the Institute is an assembly room capable of holding 300 people. The decorations are bright and the windows well treated with leaded glass by Messrs. J. R. Lee and Co. Heat is supplied by seven radiators, four on one side and three on the other. Sleeping accommodation is provided, there is a shop at the corner on the street level and the building is fitted with a lift. Mr. T. Johnson, of Great Brook Street is the contractor. Work was commenced in June 1898.

Chorlton-cum-Hardy.—The corner stone of the new church of St. Werburgh, Wilbraham Road, was laid on September 29th. The building is of Gothic design, and will be of brick, with terra-cotta dressings. It is expected to be ready for opening nine months hence. Accommodation is to be provided for 500 worshipers. The architect is Mr. R. Bassnett, Preston, and the contractor Mr. R. Carlyle, Ardwick.

Dundee.—An infectious diseases hospital is to be erected at Whitehills, Forfar, for the Dundee and Forfar districts of Forfar County Council. The sum of £5,000 was stipulated as the limit of cost for building the hospital when the conditions of competition were issued several months ago, but the total cost is estimated to amount to nearly £7,000. Mr. T. Martin Cappon, F.R.I.B.A., of Dundee, is the architect. The buildings consist of a large administrative block, with matron's, doctor's, nurses', and servants' rooms, with kitchen, bathrooms, &c. Immediately on the east and west of the administrative block are placed the isolation blocks with two wards each, and one bed, with nurses' room and bathroom, and a discharge block with undressing and dressing rooms, bathroom, and stores for patients' clothes. The scarlet fever block consists of two wards of eight beds, with nurses' room and pantries, two bathrooms, and closet—all connected with the main buildings by through ventilated passages. The typhoid and diphtheria blocks are provided with two wards of two beds, with nurses' room, bathroom, and other conveniences. The wards are placed on the high ground with a floor space of 50ft. between each building, and are connected with concrete passages. The offices are placed at the back, out of view of the wards, and consist of mortuary, two disinfecting chambers, with parlour and disinfector washing-house, large store, ambulance and van sheds, coal-houses, &c. The whole buildings are to be finished upon plain and simple lines, with first-class material and good workmanship.

Hull.—Holy Trinity Church was re-opened on October 4th after being closed for many months for repairs and restoration. Messrs. Broderick, Lowther and Walker, of Hull, were the architects who had the work in hand. The restoration has consisted in a thorough cleaning of the whole of the interior stonework, which, considering the proportions of the church (one of the largest parish churches in England) was itself a big undertaking. In doing this work no tool has been allowed to be used, the work having been done entirely with brushes, so that the character of the masonry has not been interfered with. The stoves which previously heated the church, and were the cause of agreat deal of the grime which so disfigured the interior of the building, have been removed, and the church is now heated by a low pressure heating apparatus. The electric light has been installed in place of the gas previously used, the lamps being arranged round the caps of the piers of both nave and choir. The fittings have been made as plain and as light as possible, so as not to interfere with the architectural lines of the church, and when lighted the effect is a most brilliant one. The decorations of the nave and aisle roof, which were completely obliterated by dirt, have been thoroughly restored. The removal of the organ from under the tower arch is a great improvement, as the beautiful transept windows can now be seen on entering the church. The cleaning of the interior has been done by Messrs. Bowman and Son, of Stamford; the heating by Messrs. Haden, of Trowbridge; the electric light is by Messrs. King and Co., of Hull; and the decorations are by Messrs. Dreyer and Co., of Hull. The contract for the repairs to the exterior of the church has been given to Messrs. Quibell and Son, of Hull, but owing to the strike the work has not been commenced. The total cost of the restoration will be about £4,000.

Loughborough.—A new infants' department has just be added to the Rosebery Street Schools from designs by Messrs. Barrowcliff and Alcock, of Loughborough. It comprises a school room, 50ft. by 25ft.; three class rooms, each of ample dimensions; a teachers' room, and a cloak room 26ft. by 18ft. The floors are composed of wood blocks, and the walls have a tiled dado. The building is heated throughout with hot water, in conjunction with the original school, and there is also an open fireplace in each of the class rooms and two in the school room. The height of the class rooms is 13ft. 6in., and of the school room 15ft. 6in. to the wall plate, and 19ft. 6in. to the ceiling. The class rooms open out into the main room, and have glazed screen partitions. The length of the old and new building from Rosebery Street to George Street is 206ft.

Newcastle-on-Tyne.—The new Central Primitive Methodist Church in Northumberland Road, was opened on Wednesday. The design of the church is in the Perpendicular Gothic style, and at the east corner there is a tower, which rises to a height of 120ft., and adds another to the numerous landmarks of the city. The church fronts into Northumberland Road, and is entered by a handsome doorway, above which is the window placed by Mrs. Stewart in memory of her husband, the late Ald. Stewart. On the ground floor there is sitting accommodation for 500 persons, and in the gallery, which is of horse-shoe shape, for 300. An interesting feature in the interior design is the projecting of the gallery by means of steel cantilevers, from the massive stone pillars running along the sides of the building, thus doing away with the use of iron columns, in front of the pews. From every pew there is thus a free and uninterrupted view of the preacher; the space behind the pillars being utilised as aisles, and forming a row of arches. The pulpit is conveniently placed, having behind it a space for the organ and choir. The school buildings are in Ridley Place, but are connected with the church. They consist of a large school room, with a gallery round three sides, supported by steel girders, as in the chapel. One part of the school gallery is divided into class spaces by screens and curtains. Other apartments include a church parlour or lecture hall, library, infants' school, stewards' or minister's vestry, classrooms, and caretakers' house. The principal contractor was Mr. A. Bruce, of Brighton Grove, and the sub-contractors were:—Plastering, Mr. Tubb; slating, Mr. J. Hewitson; heating and ventilating, Mr. J. Rowell; electric lighting, Mr. T. G. Usher: painting and glazing, Messrs. Adam Robertson and Son; seating, North of England School Furnishing Co. The wood-block flooring and mosaic were provided by Mr. J. F. Ebner, of London. The architect was Mr. T. E. Davidson, and Mr. W. Moore acted as Clerk of the Works. The stained glass window over the entrance has been executed by Mr. G. Baguley, of Newcastle. The window contains twelve lights and tracery. The subjects, each of which are illustrated in two lights, are the following:—"Our Lord blessing children," "The Sermon on the Mount," "Come unto Me all ye that labour and are heavy laden, and I will give you rest," "The Good Samaritan," "The Parable of the Talents," "Christ healing the sick." The tracery contains the Crucifixion, the Transfiguration, and the Ascension.

Old Trafford.—On September 28th Sir Humphrey de Trafford laid the foundation stone of a new technical institute and public library about to be erected by the Stretford District Council. The new building will occupy a prominent position at the corner of Stretford Road and Northumberland Road, and will be of brick with terra-cotta facings. The architect is Mr. W. Thorpe, of Manchester. It will provide, in addition to library and reading-room, a hall capable of holding about 600 people, as well as provision for the technical instruction classes now carried on by the Council at various elementary schools. The total cost, including furnishing, will amount to about £8,000.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

CUMBERLAND SLATES.

To the Editor of The Builders' Journal.

Clapham, S.W.

Dear Sir,—I should be glad to know the name of a firm who would supply the "Earles (or Ells) Water" Green Cumberland slates.—Yours faithfully,

AN ARCHITECT.

Apply to the Elterwater Green Slate Co., Ltd., Great Langdale, Ambleside, Westmoreland.

STRENGTH OF WROUGHT-IRON GIRDERS.

To the Editor of The Builders' Journal.

Bideford.

Dear Sir,—Will you kindly give me a formula for determining the strength of wrought-iron girders, and describe the method of working them?—Yours faithfully,

H. W.

See the article on "Wrought-Iron Beams" which appeared on page cxxvi of the Supplement to The Builders' Journal for May 24th last, No. CCXXIV., and also the letter referring to this article on page 251 of No. CCXXV.

ARCHITECTURAL LETTERING.

To the Editor of The Builders' Journal.

Newcastle-on-Tyne.

Dear Sir,—Would you kindly consider my suggestion of having some specimens of architectural lettering in your valuable paper, as I think this would be of great help to many besides myself?—Yours faithfully,

PUPIL.

We are obliged for our correspondent's suggestion, but cannot find space for such an article at present. "Alphabets, Old and New," by Lewis F. Day (3s. 6d., B. T. Batsford, 94, High Holborn, W.C.), is a good book on the subject.

BUILDING CONSTRUCTION EXAMS.

To the Editor of The Builders' Journal.

Mansfield.

Sir,—Is it compulsory for a student to hold a first-class certificate in the elementary stage of building construction before sitting for the advanced stage examination in the same subject? I have obtained a second-class certificate in the elementary stage, and would like to sit for the advanced stage at the next examination if possible: South Kensington Science and Art Examination. STUDENT.

It is not necessary to hold a first-class (elementary) certificate in order to be able to sit for the advanced. "Student" might take the latter examination without even having entered for the former. R. W. C.

TIMBER COTTAGES.

To the Editor of The Builders' Journal.

London, W.C.

Dear Sir,—I should be much obliged if you would inform me of the best reference book dealing with the construction of timber cottages. Also, which is the best material—tiles, plaster, or weather-boarding—for enclosing a wooden cottage erected on an exposed site on the south coast.—Yours faithfully,

E. M. B.

The construction of timber cottages does not differ in the least from that of any other building. Timber and tile work is dealt with in "Rivington" Vols. I. and II. and any other book on construction. The best material of the three mentioned for enclosing the cottage is tiling, but if the situation is *very* exposed, it would be preferable to see the tiling backed by brick rather than by woodwork.

R. W. C.

A RETAINING WALL QUERY.

To the Editor of The Builders' Journal.

Sir,—A street is about one in twelve out of level. Each tenant has levelled his land for building and has erected a retaining wall to keep up his neighbour's land. The retaining wall on A's land is about 8ft. high, is in a dilapidated state, and about 1ft. 6in. out of level. Owing to this, B's outhouse has gone with it, and is also in a dangerous condition; there is a party wall beyond. Will you kindly say if A is responsible for all damages, not only to his retaining wall but also to the wall of B's outhouse?—Yours truly, X. Y. Z.

The point is a nice and difficult one, but I should be inclined to think that A is liable.—H.P.B.

FORMULA FOR RETAINING WALLS.

To the Editor of The Builders' Journal.

Bideford.

Dear Sir,—Kindly explain how to work out the value of K used in designing retaining walls for earth when the following formula is used:—$T = K H \sqrt{\frac{w}{W}}$; where $K = 0{\cdot}7 \tan \frac{90-45}{2}$—Yours faithfully, H. WILSON.

The fraction $\frac{90-45}{2}$ is equivalent to 22½, which is the angle in degrees. By reference to the table of natural tangents, in Chambers' Mathematical Tables, under 22 degrees and opposite 30 minutes the value of the tan will be found to be 0·4142136, and multiplying this by 0·7, or taking seven-tenths, the value of K is found to be 0·28994952.

HENRY ADAMS.

REGISTERING PLANS.

To the Editor of The Builders' Journal.

London.

Sir,—I am about to erect some small houses, the plans of which possess some original ideas. Previous to doing so I wish to know whether it is possible, by registering or otherwise, to prevent others copying the plans and using them for the purpose of building similar houses after mine have been erected.—Yours faithfully, X. Y. Z.

So long as the plans in question are not published—making use of them for the building of the house is not publication—no one is at liberty to make a copy of them. But if X. Y. Z. publishes them, *e.g.*, by engraving and circulating them, he must register them, or he cannot prevent any person from copying the published plans. Unless the new ideas are capable of being patented, and are patented, anyone who obtains a knowledge of them can utilise them. H. P. B.

ANGLE BARS.

To the Editor of The Builders' Journal.

Bewdley.

Sir,—Kindly inform me whether angle bars made with 2in. sides are strong, and what is the ordinary length?—Yours truly,

C. J. W.

Angle bars of iron or steel can be had in all sizes from 1½in. by 1½in., to 6in. by 6in., and Measures gives the stock lengths of 2in. by 2in. steel as 25ft., and the weight as 4⅛lb. per foot lineal. "Strength" is a very general term, and what might be considered strong for one purpose might have to be considered very weak in other circumstances. Angle bars of 2in. by 2in. section are rolled from $\frac{3}{16}$in. to ½in. thick. The former would weigh about 2½lb. per foot lineal, and the latter about 5¼lb. The stock size quoted above would appear to be of ⅜in. thickness. H. E.

BOOKS ON SCOTTISH ARCHITECTURE.

To the Editor of The Builders' Journal.

Sir,—Kindly say which you consider to be the best books on "Scottish Architecture," both ancient and modern. Please give prices and state where the books may be obtained.—Yours truly, A. S.

The best book on Scottish architecture is "Billing's Baronial and Ecclesiastical Antiquities of Scotland" (four vols., £6 10s.) No cheap books on the subject have been published. Perhaps Mr. Small's "Old Stirling" (£2 2s.) would suit. Both these books are obtainable from B. T. Batsford, 94, High Holborn, W. C.

BUILDING PROXIMITY.

To the Editor of The Builders' Journal.

Altrincham.

Dear Sir,—I shall be greatly obliged if you will kindly furnish me with the following information:—(1) In the case of a building having enjoyed the rights of light for more than twenty years, what proximity of adjoining buildings constitutes an obstruction to that light?—that is, how near can another building be erected to it without creating an obstruction? I am told it must be confined below an angle of 45deg. from the base of the building. Is this angle and point of measurement correct? (2) The building in question has large area windows on one side to light the basement. How would these affect the question of obstruction on that side?—Yours sincerely, F. R. P.

(1) There is no limit of nearness, and there is no particular angle; but the fact that 45deg. are left unobstructed may, under ordinary circumstances, be considered *prima facie* evidence that there is not likely to be material injury caused by the obstruction. It is, however, in each case, a question of fact what is the amount of obstruction. (2) Area windows have the same right of light as any others.

H. P. B.

RIGHT OF BUILDING AGAINST PINE END.

To the Editor of The Builders' Journal.

Llanddarog.

Dear Sir,—I shall be much obliged if you will give me your valuable advice on the following questions:—A client of mine some time ago gave out a contract to build a pair of villas. The contractor who built them is now building on the next plot to them. He offered about half the fair value of half the pine end, which my client refused to accept. He now says that he will build a 4½in. brick wall tight against the pine end. (1) Can he legally do so, or is he not supposed to leave a clear aperture right between the two walls? (2) By building a 4½in. wall he would derive support from my client's wall, and would he not be liable to pay compensation for same? He has already built a portion of his front wall tight up against the pine end in question.—Yours faithfully, A. I. J.

(1) Everyone is entitled to build right up to the edge of his own land and to carry the structure up to any height, provided it is perpendicular and does not interfere with existing rights to light and air. So long as this power is not exceeded, no space need be left, unless there be some valid by-laws in force in the locality to the contrary. The validity of such a by-law, however, would be more than doubtful. (2) No. H. P. B.

THE ACCEPTANCE OF TENDERS.

To the Editor of The Builders' Journal.

Norwich.

Dear Sir,—I shall be glad if you will advise me on the following matter:—On September 6th I tendered for work at Cromer, under the Cromer Urban District Council. I received on September 12th a letter saying that my tender had been accepted, and in the report of the Council meeting in the local paper this was confirmed. In consequence of a letter I received from the Council I saw a

Mr. Scott, who told me that only two tenders had been received for the work, and that mine, being the lower, was accepted. As my price was much above his estimate, he requested my quantities to see if I had made any error. I assented to this, and later received a letter from the Council informing me that owing to the amount of the tenders very much exceeding the provisional apportionments, they had decided to re-advertise the contract. Is this a correct way of proceeding, and have I any remedy? I have suffered in my business on account of the action of the Council, and the matter is a serious one to me.—Yours faithfully, H. J. S.

The correspondent has no remedy, as there was no contract binding on the Cromer Urban Council. He must only make the best of a bad matter. H. P. B.

BOOKS ON MARBLE WORK.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Can you recommend any book which will enable me to get at the prime cost of work done in stone and marble (especially in marble), describing also the tools and processes adopted in working these materials. Further, I should like to know where I could obtain the fullest information on the subject of marble decoration, &c., with practical hints on design and construction.—Yours truly, ROUGE.

Macey's Specifications or Stephenson's Estimating will be found useful. The text book on marble work by Lee is out of print. "Marble Decoration and the Terminology of British and Foreign Marbles," by George H. Blagrove (post free 3s. from B. T. Batsford, 94, High Holborn, W.C.), is a good book on the subject.

CALCULATING COMPRESSION MEMBERS OF ROOFS.

To the Editor of THE BUILDERS' JOURNAL.

LIVERPOOL.

DEAR SIR,—Will you kindly inform me through the columns of your valuable journal if there is any formula for calculating the section of rods and T-irons for struts and principals in a steel roof when the weight or stress has been found? I do not want to use tables, &c.—Yours truly, STEEL ROOF.

There are various formulæ for this purpose but they are all somewhat complicated for a beginner. It is well to get an approximate idea of the size required before using a precise formula to test the strength. Thus the safe load in tons per square inch on a compression member of roof in mild steel may be taken as $= 5 - \frac{\text{length in.}}{10 \times \text{least width in.}}$ Gordon's formula is $W = \frac{c\,S\,f}{1 + \frac{l^2}{a\,d^2}}$ where W = safe load in tons. c = constant for material, say 16 for wrought iron and 24 for mild steel. S = sectional area in square inches. f = factor of safety, say $\frac{1}{4}$. l = unsupported length in inches. a = constant for shape of section, say 1,500 for cross, angle, or tee, if both ends are fixed by two or more rivets. Take $\frac{a}{2}$ for one end fixed, or $\frac{a}{4}$ for both ends pivoted. d = least diameter or breadth in inches. Example: Steel roof, length of member 4ft., thrust 3·5 tons, one end pivoted, the other fixed. Approximate section, $5 - \frac{48}{10 \times \text{say } 3} = 3{\cdot}4$ tons per square inch. $\frac{\text{Thrust}}{\text{Intensity}} = \frac{3{\cdot}5}{3{\cdot}4}$ = say 1·03 square inches area required. By reference to page 151 of "Designing Ironwork," $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{1}{4}$ angle or tee is found as the minimum section, being 1·06 square inches area. Strength of this section by Gordon's formula,

$$W = \frac{24 \times 1{\cdot}06 \times {\cdot}25}{1 + \frac{48^2}{750 \times 2{\cdot}25^2}} \doteq \text{say four tons, which}$$

allows a fair margin. HENRY ADAMS.

CLONFERT CATHEDRAL.

THIS Cathedral has, during the past few years, been under restoration at the hands of Mr. J. F. Fuller, F.S.A., architect. The chancel has been thoroughly restored. The decayed wooden flooring has been removed, and specially designed tiles laid down, and the plaster has been taken from the walls of this part of the building and the ancient stonework pointed and repaired. Stone mullions have been placed in the windows. Two of the windows have been filled with cathedral glass, and six with stained glass. The red paint has been removed from the stone pillars of the ancient east window, and also from the stonework of the chancel arch, and from the stonework of other parts of the building. A bishop's throne of carved oak, in memory of Bishop Young, has been erected in the chancel. Two two-light stained glass windows, by Messrs. Watson, of Youghal, representing the four Evangelists, have been placed on the south side of the chancel. The "Meath" Protestant Industrial School, Blackrock, having expressed great interest in the restoration of Clonfert Cathedral, the committee of the institution presented a handsome Communion table of carved oak to the cathedral, specially made by the boys of the school, in accordance with Mr. Fuller's design. Two stained glass windows, by Messrs. Hardman, of Birmingham, representing St. Peter and St. Paul, have been placed at the east end of the Cathedral. A brass Communion rail, designed by Mr. Fuller, has been erected in the chancel. Suitable stone steps have been placed in the chancel. The sacristy has been thoroughly restored without altering the ancient character of the structure. The modern plaster has been removed from the walls, and from the ceiling, thus bringing to light the marks of the old hurdle roofing. The roof and the floor have been concreted. New windows, new doors, and a new stove have been placed in this part of the Cathedral. A thorough system of drainage has been carried out around the entire building. The roof of the fabric has been repaired. The belfry tower has also been repaired. New landings had to be erected in the tower, the old ones having become quite decayed. Other necessary work has also been done. During the last few months the work of restoration of the nave has been undertaken. The old high-backed square pews have been removed, and the gallery at the west end has been taken down. Several arches, which had been filled up, some with brick and others with lath and plaster, have been opened out, and the plaster has been removed from the walls of the nave. These walls, which are in many places cracked, and in very bad repair, are now being carefully pointed and restored. There were originally two transepts; one is now in ruins and roofless, the other is completely gone. During the progress of the work in the nave, the stone arches of the transepts, which had been completely covered with plaster, have been brought to light. On removing the plaster from a portion of the walls of the vestibule of the Cathedral, some fragments of elaborately carved stonework were discovered. The greater part of the work of the restoration of the Cathedral has been carried out by Messrs. Sharp and Emery, of 17, Great Brunswick Street, Dublin. £1,467 18s. 4d., have been already subscribed towards the cost of the work, but it is estimated that £2,000 will be required to complete it—£1,000 of this amount for the restoration of the nave, and £1,000 to rebuild the transepts. It is proposed, also, to carry out the repair of the stone groining of the arch over the vestibule; to have the floor of the nave, sacristy, and baptistry laid down with encaustic tiles of a special design; to have the nave re-seated with suitable chairs; to have stone mullions placed in the windows of the nave, and to erect additional windows of stained glass in the chancel, sacristy, and nave; and to provide a new entrance door of oak of appropriate design. The Cathedral is situate in Co. Galway, and was founded in the sixth century.

Keystones.

A New Technical Institute at Hoxton is being provided by the London County Council, who have purchased a large school from the Drapers' Company at a cost of £23,000.

Grand Stand Unroofed at Dundee.—The roof of the grand stand of the Dundee Football Club was completely blown off during a recent heavy gale. The repairs will be costly.

The Organ in the Temple Church, one of the oldest in the kingdom, is being repaired. It is said that most of the old pipes are in as good a condition as they were two hundred years ago.

Relics of an Ancient Church.—The foundations of an earlier chancel and a very early piece of stonework have been discovered at Ashmansworth Parish Church, where some mural paintings dated 1200 A.D. were recently found.

Exhibition at the Holland Gallery.—The first of the autumn art exhibitions proper opened on October 5th at the Holland Fine Art Gallery, Regent Street, W. Works by Sir Alma-Tadema, James Maris, Anton Mauve, Mesdag, and Bosboom are included among the exhibits.

Peace and its Representative.—One of the most prominent of the New York decorations is a sculpture of a village blacksmith at work under a spreading chestnut tree. The intention of the sculptor was to represent Peace; he took for his model Fitzsimmons, the pugilist.

A Big Difference.—In July, 1896, the borough surveyor of Brighton estimated that the proposed alteration to the public library and museum would cost £29,244. The amount of the lowest tender now made is £40,679! The Committee have advertised for fresh tenders.

The Recent Masque at the Guildhall was a financial failure, as there was a net loss of £1,200. Owing to the restrictions of the London County Council, which limited the number of persons to be admitted to each performance to 500, the proceeds of the sale of seats fell far below anticipations.

Workington's New Town Hall.—The first prize for competitive designs and plans for this building has been awarded to Messrs. Oliver and Dodgshon, of Carlisle and Leeds, who will carry out the work. The second prize has been awarded to Mr. T. Cook, architect and surveyor, Manchester, and the third prize to Messrs. Moffatt and Bentley, architects, Whitehaven.

The "Church of the Protestation," now nearing completion at Spires, Germany, as a memorial of the origin of the name "Protestant" at the famous Reichstag in that city in 1529, will have a huge tower containing the "Hall of the Free Cities." A sum of 600 marks has been collected towards the cost of the sculptured armorial bearings in this hall in each of the thirteen cities that signed the "Protest."

A Handsome Memorial Brass to the memory of the late Rev. C. W. Lohr, has been erected in the church at Alburgh, Norfolk. The designer of the brass is Mr. W. R. Weyer, Bank Street, Norwich, and the engraver is Mr. Harold East. The border of the brass is treated with conventional Gothic foliage, and arranged in three canopies, with elaborate foliated and crocketed finlials in relief, in the centre of which is a Gothic cross surmounting an inscription.

The Glasgow School of Art, 167, Renfrew Street and 11, Dalhousie Street, Glasgow, has arranged a very strong series of classes for the winter session, from the 16th inst. to January 27th. In connection with the architectural classes there are offered for competition two bursaries of £5 each, two bursaries of £10 each, two travelling studentships of £50 and £60 respectively, and numerous other prizes. Prospectuses can be had from the Secretary at 167, Renfrew Street.

Paisley Abbey is proposed to be restored at an estimated cost of £35,000.

Landslip at Cromer.—About 150,000 tons of the cliff contiguous to the golf links at Cromer fell on October 4th.

The New Imperial Theatre, Bordesley, has just been opened. It has been erected at a cost of about £25,000.

St. Deniol's Library.—The Duke of Westminster laid the first stone of this building at Hawarden on October 5th.

A New Church School at Chorley is to be built at a cost of about £1,800. The foundation stone has just been laid.

New Theatre at Perth.—The ceremony of laying the memorial stone of a new theatre at Perth was performed last Friday by Mr. George Alexander.

Three New Lancets are to be added to the "Archbishop's Window" in Gray's Inn Chapel. The three new lights will represent Wake, Whitgift and Juxon.

The Arts and Crafts Exhibition was opened at the New Gallery, Regent Street, W., on Monday last. A special criticism of the exhibits will appear next week.

Cheyne Walk, Chelsea, is at present a somewhat narrow thoroughfare, varying from 26ft. to 40ft. in width. It is proposed to give it a width of from 40ft. to 60ft.

A Bust of Lord Audley is to be placed in the new Town Hall which is being erected at Colchester. The bust is the gift of the legal practitioners of the borough.

Mr. James Hutcheson, granite merchant, King Street, Aberdeen, died last Saturday week. Mr. Hutcheson was employed at the building of Balmoral Castle.

St. Andrew's Church Hall, Wembley, which has just been erected for the Presbyterians, was opened last week. It has seating accommodation for about 300 persons.

New United Presbyterian Church at Abbeyhill.—The foundation stone of a new United Presbyterian Church at Abbeyhill was recently laid by the Rev. Dr. John Smith.

The Sanitary Inspectors' Association held its annual general meeting at Carpenters' Hall on Saturday night. Mr. W. H. Grigg (Fulham) was elected as the new Chairman of the Council.

Erratum.—At the top of the second column of page 133 of last week's issue Mr. H. A. Gribble's name was, owing to a printer's error, given as "Fribble." We regret that this mistake should have been made.

A New Rectory adjoining St. Alban's, Cheetwood, is to be erected at a cost of about £2000. The levelling and fencing of the whole of the land belonging to the church, at an additional cost of £3,000, is also contemplated.

Architecture at the Grocers' Exhibition.—One of the principal attractions at the Grocers' and Allied Trades Exhibition at Islington was a bungalow, the roof, walls, windows, ornaments and furniture of which were of soap.

A Landslip at Dover Harbour Works occurred late on Friday night while the work of removing an overhanging cliff in the neighbourhood of St. Margaret's was in progress. Several hundreds of tons of chalk fell, completely burying the workmen.

The Adorning of the Streets and Squares of Frankfort with works of sculpture is to be carried out, and Dr. L. Gans has presented to the municipality of the city the sum of 150,000 marks to form the nucleus of a fund for the purpose. Others have contributed, and the municipality is now in a position to spend 6,000 marks annually on the beautification of the city.

Proposed Improvements at Manchester, to cost £945,000.—On October 4th the Manchester City Council sanctioned application being made to the Local Government Board to borrow £60,000 for a new small-pox hospital, £25,000 for the purchase of a plot of land in a crowded part of the city, and £860,000 in connection with the municipalisation of the tramways, referred to last week.

Llanishen Church, Cardiff, is to be extended from designs by Mr. Douglas Blessley, architect, of Cardiff, at a cost of about £1,400.

The Largest Cotton Mill in existence has just been commenced at Manchester (New Hampshire). It will be 1,600ft. long and 100ft. wide.

Electric Lights on the Nelson Column are, it is stated, to be used by the Navy League on the occasion of the forthcoming celebration of the Battle of Trafalgar.

New Manchester Theatre.—The foundation stone of the new Victoria Theatre at Lower Broughton, Manchester, was laid by Sir Henry Irving on October 4th.

New West-End Church.—The Royal Commissioners of the Exhibition of 1851, have provisionally granted an excellent site for the erection of a new church near Queen's Gate, London, W.

New G.P.O. Dining Rooms have been provided at a cost of about £25,000 by the adaptation of a commercial block of premises, having frontages to King Edward Street and Angel Street, E.C.

Change of Title.—Mr. John Byford, lime, cement, brick, and fire goods merchant, of Poplar, London, E., has taken his son into partnership, and in future the firm will be known as John Byford and Son.

Mr. Alfred East, A.R.A., was entertained to dinner at Kettering, his native town, on October 3rd, when he said that no nobler character than the late Lord Leighton had ever graced the profession.

The Belfast Art Society opened its nineteenth annual exhibition of paintings and sketches in the Art Gallery of the Belfast Free Library on October 4th. The exhibition will remain open for a month.

A New Workmen's Mission Hall at Sheffield has been built in Norfolk Street from designs by Mr. J. D. Webster, architect, at a oost of £4,000. The contractor was Mr. James Fidler, of Savile Street.

The Highest of European Hotels will be the one now being built on the summit of the Collodi Gigante, in the Savoy Alps. It will be three stories high, and will be provided with a powerful electric search light.

A Memorial to Simon de Montfort, in the form of an equestrian figure in bronze under an aluminium canopy, with other figures grouped around on a grey Cornish granite base, is proposed to be erected at Evesham.

Municipal Dwellings for Ealing are proposed to be erected at a cost of £37,300 on a site at the corner of Ealing Road South and Pope's Lane (now under contract for purchase). The site will allow 121 cottages to be erected.

Vacancy at King's College.—The Professorship of Architecture and Building Construction at this college has fallen vacant, owing to the death of Professor Banister Fletcher. Applications will be received up to Saturday, October 21st.

The Woodpeckers Art Club and the Art Circle, at Norwich, are both holding their autumn exhibitions of members' work, the first named in a top room over Coleman's premises, on Bank Plain, and the latter at their usual room in Exchange Street.

A Monument was unveiled at Margate last Wednesday, which has been erected on the sea front to the memory of the nine men whose lives were sacrificed in the surf boat disaster on December 2nd, 1897. The monument is surmounted by a bronze figure of a lifeboatman overlooking the Nayland Rocks (the scene of the disaster), and is the work of Mr. Calcott.

Memorial to Sir Sydney Waterlow.—The committee formed for the purpose of erecting a suitable memorial in Waterlow Park, Highgate, to Sir Sydney Waterlow' have decided that it shall take the form of a bronze statue of Sir Sydney, on a granite pedestal, and have commissioned Mr. Taubman to execute the work, which will cost about £1,000. The statue will probably be placed on the lawn in front of Lauderdale House.

Fall of a Church Steeple at Wigan.—During a recent severe gale the steeple of the Holy Family Church, Platt Bridge, fell through the roof, doing great damage. Had the mishap occurred an hour later many worshippers would have been in the building.

A New Methodist Chapel at Washwood Heath is being built by Mr. T. Johnson from designs by Messrs. Ingall and Son. The building will seat 400 persons, and will cost about £3,000. It is to be in modern Renaissance style, of red brick with facings of gray terra-cotta.

St. Peter's Church, Hepworth, Suffolk, was re-opened recently by the Bishop of Ely. It suffered considerably from a disastrous fire, which occurred about eighteen months ago, and has now been restored at a cost of over £2,000. The church is in early English style, and is an interesting building.

A Collection of Ecclesiastical and Educational Art was opened by the Bishop of London last Saturday at the Imperial Institute. The exhibition will remain open until next Saturday. Many antiquities have been lent for exhibition, and stained glass, embroidery, carvings, metal work, and other decorative examples are on view.

Sandringham House and York Cottage' Sandringham, have recently been lighted with the Welsbach incandescent gas light. The former ornamental fittings have been preserved as far as possible. In the private apartments of the Prince and Princess of Wales the "Surprise" pendants have been at a introduced.

"The Registration of Architects" is the subject of the debate that will take place at the first meeting this session of the Discussion Section of the Architectural Association, to be held at 56, Great Marlborough Street, W., on Friday, October 13th, at 7 p.m. Messrs. G. A. T. Middleton and A. R. Jemmett will open the debate.

The Sussex Archæological Society visited the Roman city of Silchester last Wednesday, and inspected the recent excavations. They previously went over the Reading Museum, where the antiquities found at Silchester are deposited. The Roman remains, the walls, gates, and excavations, were described by Mr. W. H. St. John Hope.

A Stained Glass Window has been placed in the tower at the west end of St. Saviour's Church, Hockley, in memory of the late Rev. M. Parker. It is a single figure window, with the Ascension as its subject. The work was executed by Messrs. Hardman The church itself has just been thoroughly cleaned and decorated, and the organ rebuilt.

A New Organ at M'Cheyne Memorial Church is being built by Mr. John R. Miller, of Dundee, from the specification and under the supervision of Mr. David Stephen. The organ consists of two manuals and pedals, and is fitted with tubular pneumatic action throughout, both for keys and stops. The bellows is actuated by one of Melvin's water-engines, and there is also a hand lever for use in emergency. The case is of yellow pine, and has been made to designs furnished by the architect who had charge of the structural alterations required for the erection of the organ. The console board is built apart from the body of the organ, and is fitted with radiating and concave pedals.

Roman Pavement at Dorchester.—A county meeting was held at Dorchester recently, on the site of the recently discovered Roman pavement, with the object of considering the advisability of acquiring the relic. The owner of the land on which it was found offered to sell the pavement to the county for £500, on condition that it was removed to the county museum, or, as an alternative, he was prepared to sell the pavement and the adjoining premises for £1,500. A communication from the British Museum suggested that the pavement should remain in its present position and be carefully preserved. A resolution was unanimously passed that the pavement should not be allowed to leave the county, and a committee was appointed to consider the best means of acquiring it.

The Picture of the Thanksgiving Service outside St. Paul's Cathedral on Jubilee Day, 1897, is to be presented by the donor, Mr. Henry Clarke, to the Lord Mayor as representing the Corporation, next Wednesday, and it will be hung in the Art Gallery of Guildhall as a souvenir of that memorable event. Mr. A. C. Gow, R.A., is the artist.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 4 0
Sainfoin mixture	do.	3 15 0	4 7 6
Clover, best	do.	4 0 0	5 0 0
Beans	per qr.	1 10 0	—
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 3 4	1 6 10
Colza Oil, English ...	per cwt.	1 4 6	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 9 0	—
Linseed Oil	per cwt.	1 2 2	—
Petroleum, American ...	per gal.	0 0 7	—
Do., Russian ...	per gal.	0 0 5 5/8	—
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 4 0	1 5 0
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 17 9	—
Glue	per cwt.	1 14 0	2 18 0
Lead, white, ground, carbonate	per cwt.	1 2 0	1 3 0
Do. red	per cwt.	0 18 1½	—
Soda crystals	per ton	3 10 0	—
Shellac, orange	per cwt.	3 2 0	—
Pumice stone, ...	do.	0 8 9	—

METALS.

Copper, sheet, strong ...	per ton	88 0 0	—
Iron, bar, Staffs. in London	do.	8 10 0	9 0 0
Do. Galvanised Corrugated sheet ...	do.	13 10 0	14 0 0
Lead, pig, Spanish ...	do.	15 12 6	16 0 0
Do. do. English common brands	do.	16 3 9	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	16 10 0	16 12 6
Do. pipe	do.	17 5 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	do.	9 15 0	10 15 0
Tin, Foreign	do.	149 15 0	150 5 0
Do. English ingots ...	do.	153 0 0	154 0 0
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	29 10 0	—
Do. Spelter	do.	22 0 0	22 5 0

TIMBER.

Soft Woods.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load.	3 0 0	4 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Do. Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	do.	4 0 0	6 10 0
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd.	do.	12 10 0	12 15 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	10 10 0	16 0 0
Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	8 10 0	10 15 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	10 5 0	16 15 0
Do. White Sea	do.	13 0 0	—
Do. Quebec Pine, 1st...	do.	20 0 0	23 15 0
Do. do. 2nd	do.	13 15 0	15 15 0
Do. do. 3rd &c.	do.	7 15 0	9 15 0
Deals, Canadian Spruce, 1st	per P. Std.	9 0 0	10 5 0
Do. do. 3rd & 2nd	do.	6 5 0	7 15 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	8 5 0	11 0 0
Flooring Boards, 1 in. prepared, 1st	per square	0 11 3	—
Do. 2nd...	do.	0 10 3	0 11 3
Do 3rd &c.	do.	0 7 9	0 8 0

Hard Woods.

Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4	—
Do. Honduras	do.	0 0 3½	—
Do. Tobasco	do.	0 0 2¼	0 0 3¾
Elm, Quebec	per load	4 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 23/32	—
Do. African ...	do.	0 0 4 1/32—	4 15/16
Do. St. Domingo ...	do.	0 0 5¼	—
Do. Tobasco ...	do.	0 0 3¼	0 0 8¼
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	9 5 0	15 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 2 6	0 4 0

COMING EVENTS.

Wednesday, October 11.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—(1) Inspection and Demonstration in the Parish of St. George's, Hanover Square, at 2 p.m., conducted by Mr. Albert Taylor. (Prof. A. Bostock Hill, M.D., D.P.H., F.I.C., on "Trade Nuisances." 8 p.m.

Thursday, October 12

Society of Architects.—Examination in architecture and building construction, &c., at St. James's Hall, Piccadilly, W. (Second day).

Worshipful Company of Carpenters.—(Lectures on Sanitary Building Construction at Carpenters' Hall.)—Prof. T. Roger Smith, F.R.I.B.A., on "Site, Foundations, and Sanitary Requirements." 7.30 p.m.

Friday, October 13.

Glasgow and West of Scotland Architectural Craftsman's Society.—Opening meeting at 204, George Street, Glasgow. Lecture on "Mild Steel," by Prof. Sexton. 8 p.m.

Architectural Association (Discussion Section).—Debate on "The Registration of Architects," opened by Messrs. A. R. Jemmett and G. A. T. Middleton. 7 p.m.

Society of Architects.—Examination in architecture and building construction, &c., at St. James's Hall, Piccadilly, W. (Last day).

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. Henry R. Kenwood, M.B., D.P.H., F.C.S., on "Infectious Diseases." 8 p.m.

Saturday, October 14.

Royal Institute of Public Health.—Last day of Health Exhibition at Blackpool.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and Demonstration at 2 p.m.

Monday, October 16.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers).—Mr. Henry R. Kenwood, M.B., D.P.H., F.C.S., on "Methods of Disinfection." 8 p.m.

Wednesday, October 18.

Sanitary Institute.—Lectures and Demonstrations for Sanitary Officers.)—(1) Inspection and Demonstration of Disinfecting Apparatus and Model Steam Laundry at St. John's Wharf, Fulham, at 3.30 p.m., conducted by Mr. W. G. Lacy. (2) "Calculations, Measurements, and Plans and Sections."

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

BELFAST.—For laying water main, Knockbracken (second section), for the City and District Water Commissioners. Mr. L. L. Macassey, C.E., Westminster and Belfast :—

Patterson and Son, Ltd. ...	£13,034 19 5
H. and J. Martin, Ltd.... ...	10,734 0 0
Fish and Lefanu	10,298 6 0
Lanerty & Sons, Belfast*	£9,121 0 0
J. Hemmingway	7,765 0 0

*Accepted.

FEENEY (co. Derry).—For the building of a parochial house at Feeney, co. Derry, for the Rev. John Gribbon, P.P. Mr. James P. McGrath, C.E., architect, 28, Carlisle-road, Londonderry. Quantities by Mr. John Ferguson, surveyor, London-street, Derry :—

Daniel McCaffrey ...	£892 6
Jas. Gallagher and Sons	822 3
Daniel Gillispie	780 0
Humprey Campbell...	£730 0
James Deeney*, Dungwen	625 0

* Accepted.

GOREY (Ireland).—For additions, &c., to workhouse, for the Guardians. Mr. B. W. Webster, architect, Gorey :—

W. Fortune ...	£1,300 0 0
F. A. Mellon ...	1,100 0 0
John Byrne, Gorey*	£994 17 6

*Accepted.

HALLWILL (Devon).—For the erection of a cottage hospital, near the railway station. Mr. C. F. A. Voysey, architect, 6, Carlton Hill, London, N.W. :—

J. Northcott	£2,500 0
J. A. Beckley	2,492 0
Ellis and Son	2,372 0
Wm. Wiffin	£2,245 0
Marwood White ...	2,215 5

LLANDILO.—For the lighting of the town by electricity for the Urban District Council. Mr. David Jenkins, F.R.I.B.A., surveyor to the Council, Abbot's Hill, Llandilo, S. Wales :—

Kite and Co.	£3,935
Arthur Bayley	3,820
Crompton and Co. ...	3,007
Fletcher	2,440
Bertram Thomas, Manchester*	£2,201
D. Isaac, Maindingham*	2,200

*The two last under consideration.

LONDON, N.W.—For decorative works at No. 255, Camden-road, N.W., for Mr. Benjamin Benwell. Messrs. Clark and Hutchinson, architects, 28, John-street, Bedford-row, W.C. :—

Hayward and Son	£198
F. T. Bruton and Sons...	165
J. Selway and Sons * ...	£93

* Accepted.

LONDONDERRY.—Accepted for additions to Mr. Richard Gallagher's premises, Waterloo-street. Amended plans. Mr. James P. McGrath, C.E., architect, 29, Carlisle-road, Londonderry :—

Robert Colhoun, Strand-road, Londonderry £203 18

LONDONDERRY.—Accepted for building two dwelling-houses at Bishop-street, Londonderry, for Mr. Thomas McCallion. Mr. Jas. P. McGrath, C.E., architect, 28, Carlisle-road, Londonderry :—

J. E. Maultsaid and Co., Rosemount £420

MALDON (Essex).—For the construction of brick and concrete reservoirs, &c., for the Rural District Council. Mr. H. G. Keywood, C.E., 6, Market Hill, Maldon. Quantities by engineer :—

H. Weldon	£1,566 13 11
Ketteringham ...	1,487 0 0
West, Chelmsford *	£1,391 0 0

* Accepted.

[Engineer's estimate, £1,200.]

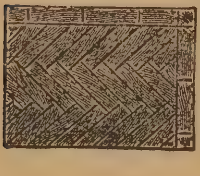
MOVILLE.—For painting interior of Druorg Chapel, Moville, for the Rev. James Harkin, C.C. Mr. James P. McGrath, C.E., architect, 28, Carlisle-road, Londonderry :—

Charles Doherty	£60 0
Patrick Malley	65 0
Jas. Gallagher & Sons	£49 0
John Dumion, Derry *	35 10

* Accepted.

UPTON LOVELL (Wilts).—For rebuilding the Woollen Cloth Mills, recently destroyed by the fire, for the Upton Lovell Manufacturing Company. Mr. Walter W. Snailum, architect, Trowbridge. Quantities by the architect :—

	Block A.	Block B.	Block C.	Total.
	£	£	£	£
C. A. Hayes	2,550 0	895 0	759	4,204
Hayward and Wooster	2,000 0	839 0	660	3,499
G. Moore	2,016 10	799 10	626	3,442
Architect's estimate ..	2,039 0	855 0	668	3,562



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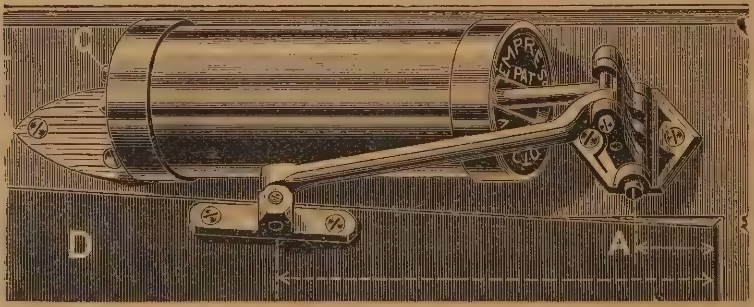

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CISTERNAGE AND CONSTANT WATER SERVICE.*

By H. ALEXANDER, Chief Sanitary Inspector, Shoreditch.

THE use of cisterns in conjunction with the constant water service is one of the subjects suggested by authority for discussion at this Congress, and I venture to think that amongst sanitary inspectors it will readily be agreed that it is a subject of high importance to the public health, and one upon which, from our daily observations, we are well qualified to speak and to give counsel.

The quality of the water supplied for domestic use to a community has always been a matter of great concern to those interested in public health, and the highest efforts of engineering science have been devoted to capturing pure supplies drawn from mountain lakes—or raised from subterranean sources—until now we are probably within measurable distance of the time when no community will be dependent upon a water supply drawn from a questionable source. Unfortunately, while science is doing, and has done, all that it is permitted to do in bringing pure water to our doors—it has stopped there—until quite recently no improvement has been effected in the domestic cistern; so that to-day, however pure may be the source of supply, however high may be the standard of purity in water when delivered from public mains, its measure of purity when it reaches the consumer's lips depends entirely upon the character of the cistern in which it has been received and stored. That being so, there are

Three Questions

which seem naturally to arise, upon which public opinion stands somewhat in need of guidance and direction:—(1) Are cisterns necessary in conjunction with the constant supply? (2) Are the cisterns in ordinary use properly adapted for the purpose of storing and protecting drinking water from pollution? (3) What should a cistern be in order to give a perfect measure of security against its contents being polluted?

I have given the question of cisterns in conjunction with constant supply precedence, because it is pretty certain that at no very remote period intermittent supply will be entirely discarded, and constant supply will become universal; and if we bear in mind the varying conditions under which water is obtained, and the exigencies of its distribution throughout the country, we shall probably agree that the question of cisternage in conjunction with constant supply is a great practical question, upon which the interests of the public health largely depend. The transition from the intermittent supply to the constant service has been hailed by many householders as an opportunity enabling them to dispense with their unsuitable and objectionable cisterns altogether—while by other householders, and proprietors of hotels, restaurants, clubs, and other institutions, they have been retained for supplying the flushing arrangements of water-closets, baths, &c., but mainly for holding a store of water in reserve for use when, for any reason, the constant service may be temporarily suspended, drinking water being drawn direct from the main supply pipe. That is all very well, in either case, while the service is maintained, but when the service is suspended, as it frequently is, especially in the metropolis, it is altogether otherwise, and very much so where no storage cistern is retained; for the requirements of water-closets and boilers, in addition to other household necessities, are in no way diminished at such times; on the contrary, it very often happens that the demand is greatest when the supply is least, and that great nuisances arise, occasioning hardship. On the other hand, where a cistern has been retained to secure a reserve store, and where drinking water is drawn direct from the main, a long time may elapse before it becomes necessary to draw for drinking purposes upon the reserve store, during which time it would be safe to say that generally very little attention is paid to the condition of the cistern; and as carelessness and thoughtlessness have always characterised the average householder, in reference to the condition of his cistern, there is great danger that he and his household, and the "stranger within his gates," may unwittingly drink water drawn from a foul cistern, when for a time they are unable to draw from the main.

If it may be assumed from these considerations that reserve store cisterns in conjunction with the constant service are necessary, it follows equally that such cisterns must be properly adapted for their purpose, and that brings me to my second question—Are the cisterns in ordinary use properly adapted for storing and protecting drinking water from pollution? To that question I am perfectly sure that there can only be one answer, from a sanitary inspector

It is therefore certainly not with a view to imparting information to you, that I ask you to take into your consideration what

The Ordinary Domestic Cistern

is, but rather that we may fulfil in our degree the purpose of this Health Congress, by arousing and directing public attention, if so we may, to the dangerous conditions attendant upon, and indeed inseparable from, the cistern in ordinary use; conditions with which ages of neglect have familiarised the public to such an extent that a deposit of filth in the bottom of a cistern is accepted by many people as if it were the product of an inexorable law of nature, rather than an effect arising from causes that ought to be removed.

Cisterns in olden times were formed of stone or slate, of lead or of cast iron; later on they were constructed of wood lined with lead or zinc, but in these latter days they are generally constructed of galvanised iron, a material that is generally accepted as being perfectly satisfactory; but whether we have progressed as to the material employed or not, there has been no progress until very recently in the form of construction of cisterns. Whatever material is used, the same crude forms, of which we have specimens hundreds of years old, are still in vogue, and their numbers are largely increasing without let or hindrance, as houses are multiplied.

I was recently informed by a manufacturer that he was under contract to supply several hundreds of cisterns for the houses to be built on one metropolitan suburban building estate. These cisterns measure 3ft. 6in. by 3ft. 6in., and are 3ft. deep. They are simply open, square iron boxes; they are not provided with any protection against pollution. They are exactly like those made by our remote ancestors, and it is very suggestive of the filthy condition under which water is generally stored in such receptacles that it is found necessary to fix the outflow pipe an inch or two above the bottom, to prevent the grosser particles passing down and mingling with drinking water.

Such are the cisterns in ordinary use. They are not adapted for retaining water in a state of purity. They have no pretence to anything more than a certain capacity for storage, and they convey the fullest assurance that, under the most favourable conditions, the sediment of water and atmospheric deposits will accumulate and become a filthy compost in the bottom.

The Remedy.

What is then to be done? Are the resources of civilisation played out, and must the people drink water out of filthy cisterns for ever, as they have in the past; or, giving way to despair, reject storage cisterns altogether, and submit to all the dangers and annoyances incidental to accidental or other interruptions of the constant service? That is not so any longer, and the first note of departure from the old ways was sounded authoritatively in the report presented by Col. Ducat and the late Dr. Barry, in 1895, to the Local Government Board on the alleged failure of the East London Water Supply in the summer of 1895. In that report the commissioners said (page 16):—"Nothing could be further from our intention than to advocate any return to the old defective cisterns, with their movable wooden cover, but we do advocate the provision of properly designed cisterns. By a properly designed cistern we mean a cistern which shall be so constructed as to exclude alike the possibility of the entrance of dirt from the atmosphere, and the accumulation of any deposit from the water itself, whilst at the same time the water in the cistern is under the same pressure as the water in the main itself; in other words, the cistern that would satisfy us is merely a local enlargement of the water main. Such a cistern is in our opinion subject to none of the objections commonly urged against the use of cisterns. Under the best arrangements there must be times when periods of interruption of a constant service will occur, and at such times want of water for domestic purposes, for flushing water-closets, sealing water traps, &c., is calculated to lead to conditions injurious to health which should not be allowed to exist, and which a proper use of really efficient cisterns would guard against."

All honour to these gentlemen for their condemnation of cisterns as they are, and for their suggestion as to what a cistern should be; they have very clearly set out two conditions, without which it would be impossible to affect any real improvement in cisternage. First,

The Model Cistern

must exclude the possibility of the entrance of dirt from the atmosphere; and, second, it must prevent the accumulation of any deposit from the water itself. The accomplishment of these two conditions is a primary necessity, and has been found easy of attainment. A third condition, that the cistern must be under the same pressure as the water in the main, is also very easy of attainment; but if we remember the great pressure in some public mains, varying in the metropolis, as shown by General De Courcey Scott, water examiner, in his report for May, 1899, from a head of 510ft. by the Kent Waterworks to a head of 145ft. by the Chelsea Waterworks, we must conclude that a domestic cistern under anything approaching such pressure would probably be a dangerous hydraulic bomb, and that, to ensure any measure of safety, it would need to be made of very stout plate, be cylindrical in shape, and probably limited to small dimensions. These limitations are not at all necessary, as it has been demonstrated that a cistern of any size from 100 gallons to 1000 gallons can be fitted in such manner as to be enclosed, self-cleansing, and without pressure, and to be practictically what the Commissioners desired, viz., an enlargement of the main.

Breach of Contract: Technical Damages.—On October 3rd at Dundee, before Sheriff Campbell Smith, Peter Girrity, contractor, of Dundee, sought to obtain £10 from A. and T. Craig, builders and contractors, Dundee, for alleged breach of contract. Plaintiff stated that on May 30th he made a bargain with the defendant for excavating between 400 and 500 cubic yards in Hill Street, Dundee, for which he was to be paid at the rate of 1s. 7d. per yard. Defendant subsequently informed him that he did not want the contract to go on, and that he would do the work himself. Plaintiff assessed the loss he thus sustained at £10. Mr. T. Craig, the sole partner in the defending firm, said that he offered plaintiff 1s. 6d. a yard to do the excavation, and that before the bargain was completed he should come and see the ground. He appointed to meet plaintiff next morning on the ground. Within half an hour of their conversation, witness told plaintiff that he need not trouble to go to Hill Street next day, as he intended to do the work himself. He denied that any contract was entered into between them. The Sheriff held that technically in law there had been a breach of contract. There was no sign of any damage having been occasioned to the plaintiff. For a technical breach of contract there would be technical damages—7s. 6d., with 9s. expenses.

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* A Paper read before the Annual Congress of the Sanitary Institute, held at Southampton on August 29th, 30th, and 31st.

PHOTOGRAPHIC SURVEYING.

THIS was the title of a paper read by Mr. J. Bridges Lee, M.A., before a recent meeting of the Society of Engineers. In introducing his subject the author referred to the early history and literature of Phototopography, and to some of the most important surveys effected with the aid of photographs. He then enunciated the chief causes which had impeded the progress of metrophotography as applied to surveying in this and other countries. The author then proceeded to criticise and dispose of these hindrances which he showed no longer existed. He then set out in detail the special advantages of the photographic method. Amongst these advantages are: (1) A more complete and accurate record than can be obtained by any other means; (2) saving of time in the field; (3) ability to take full advantage of short, clear interludes in unsettled weather; (4) special advantages for military purposes in an enemy's country; (5) utility for travellers rapidly traversing a country; (6) usefulness for detecting geological and physiographical changes; (7) economy in operation.

The author then passed in review the various kinds of photo-topographic apparatus which had been designed and constructed, pointing out the distinctive features of most of the best known instruments. He stated that spherical projection had been proposed on account of its theoretical advantages, but he pointed out that it had never been brought into use in consequence of practical difficulties. Cylindrical projection had also been proposed and tried, with the result that while fairly satisfactory panoramic views had been obtained, cylindrical projection had not been found suitable in practice for serious survey work. He observed that all the best photographic survey work everywhere had been done with plane projection instruments. It was pointed out that the instruments used for photographic surveying might be exceedingly simple, consisting of nothing more than a good fixed focus box camera and lens, with levelling screws and levels, and marks inside the box to indicate the termination of the horizon and principal vertical lines.

The Canadian surveys, which the author said were among the best, had been effected by the aid of very simple instruments, supplemented by theodolites carried separately. On the other hand instruments might be very complex, like most of the continental forms, which were really photo-theodolites, the camera and theodolite being combined in one instrument. It was pointed out that nearly all photo-surveying instruments were designed to be used with the optic axis always horizontal, the Italian military instrument and Koppe's being exceptions to the general rule. The author then explained that until he introduced his improvements in photo-grametric apparatus all such instruments, without exception, whether simple or complex, yielded nothing but ordinary photographs, with marginal marks to indicate the terminations of the principal vertical and horizontal lines, which had to be ruled in afterwards by hand.

The author then proceeded to describe the improvements made by him, and which were designed to facilitate the subsequent interpretation of the photographs. These improvements consist of certain mechanical appliances inside the camera for securing an automatic record on the face of every picture taken of the horizon and principal vertical lines; of the compass bearing of the optic axis or principal plane; of a scale of horizontal angles applicable to all points visible in the picture; and of memoranda of useful information relating to the particular picture. The author then described the method of conducting a photographic survey, and of plotting maps from survey photographs.

AUSTRALIAN TIMBER EXPORTS.

ALTHOUGH Australia possesses several of the largest known areas of forest country, abounding with timbers of a most useful character, principally hard woods, the export trade in the same remains in an undeveloped condition, save in Western Australia, where considerable quantities of jarrah and other hardwoods are annually shipped to South Africa, Europe, and elsewhere. In New South Wales, notwithstanding the great natural resources of the colony, the value of the timber imported is greatly in excess of that exported, the bulk of this imported timber consisting of pines and other soft woods, the native pine being in some respects inferior to Oregon and Kauri, but there are other softwoods equal to any of the timbers imported. The imports during 1898 consisted of dressed timber valued at £65,567, rough timber estimated at £328,753, and sundries, such as doors, sashes, shooks, and staves, laths, shingles, and palings, worth £35,741. More than half of the dressed timber in 1897 came from Norway, a total of 8,723,450 sup. feet being altogether imported. The United States came second; while a large quantity was imported from Victoria, from South Australia, from Germany from New Zealand, from the United Kingdom, and from Canada. Of the rough logs, the United States stood first, with South Australia and New Zealand close behind. The bulk of the United States exports were from Port Eureka, California; and the Canadian, from Puget Sound. Australian hardwood trees are remarkable for the great size of the beams which may be obtained from them, as well as for the extreme strength and durability of their wood, the grey ironbark having a resistance to breaking equal to 17,900lb. per square inch, as compared with a mean of 11,800lb. for English oak, and 15,500lb. for teak. None of the other timbers of the colony have so high a resistance to breaking as this description of ironbark; but nearly all the varieties have a greater strength than oak. The absence of branches for the greater portion of the height enables the timber to be obtained to the best advantage; and as full-grown trees of most varieties are rarely less than 100ft. high, with corresponding girth, the quantity of timber obtainable is very large. It will readily be seen, therefore, that the timbers of the colony are in every way suitable for building construction, wood-blocking, jetties, railway carriages, and other work in which great strength and durability is required. The area of ironbark lands belonging to the Crown in New South Wales is about 16,870,000 acres, containing sufficient timber ready for cutting to yield 167½ million sleepers, and if private lands are also taken into account the number of ironbark sleepers alone which the colony can produce may be set down at 500 millions, sufficient for no less than a quarter of a million miles of railway track. Under proper forestry regulations and conservation the production of grey ironbark could be continued on a most extension scale for many years to come.

Armoured Doors Under Actual Fire.—A fire occurred a few weeks ago at the premises of Messrs. J. and G. Clayton, cotton manufacturers, of Whitefield, near Manchester. Between the shed where the fire broke out and the mill were two openings, cut off by Dowson, Taylor and Co.'s armoured fireproof doors. The shed was completely destroyed, with all its contents, but the armoured doors, in spite of the intense heat to which they were subjected, fully proved their fire-resisting qualities and prevented the fire from getting through to the mill. An examination of the door after the fire revealed the following facts:—The steel plates on the fire side were bulged out about 2in., and the first of the three layers of timber was carbonised. In all other respects the doors were as perfect as when put in, and had not buckled or twisted in the least.

Builders' Notes.

The Master Painters of England and Wales held their annual convention at Hereford on October 3rd, when Mr. Vaughan, of Hereford, delivered the presidential address. He said that the association was exceptionally strong in the north of England and the Midlands, but they would like more members in the east, west, and south of the country. Strikes he described as a brutal way of settling disputes, and he trusted that in future boards of conciliation would be the rule and not the exception. He quoted the two following sayings of Ruskin:—"All art worthy of the name is the energy neither of the human body alone, nor the human soul alone, but of both united, one guiding the other. Good craftsmanship and work of the fingers joined with good emotion and work of the heart." And "Life without industry is guilt, and industry without art is brutality."

Which is the back of a House?—This question recently came before the Hayward's Heath Petty Sessions in the case of the Hayward's Heath Urban Council *v.* Richard Broughton Briggs. Lemuel Backshall, surveyor to the Council, said the building known as "The Gables" was a residential house with stabling. The entrance faced east. The stable door and door of cottage faced south. The entrance to the stable yard was on the east side. There was no building on the north side. Defendant was building close to the boundary there, leaving no air space. By keeping the building 10ft. further south, air space could have been provided. The stabling was practically built. By the by-laws there should be 10ft. air space; practically there was not 10in. By Mr. Maynard (for the defence)—He defined "front" as the opposite side to the back. He called the south the front because the entrances were there. He should say "The Gables" fronted the east. The stable was parallel. There was no by-law preventing an entrance at the side. There was air space on every side except the north, and unless the south was fixed as the front the by-laws were complied with. A block plan should show to whom land on the boundaries belonged, but these plans did not. Without this being shown he thought the adjoining land belonged to the defendant. The plans were disapproved by the Committee on August 28th and by the Council on September 4th. By Mr. Prince (for the prosecution)—If the front was west there would be no air space at the back of the cottage because of the stables. If they faced east there would be no air space to the stables because of the cottage. Mr. Maynard called George Burstow, a Brighton surveyor, who prepared the plans of the coachhouse and stabling, and he considered the east to be the front, as the main entrance was on that side. Defendant's counsel said there was no definition of rear or front in the by-laws. He contended the front was that part first approached from the entrance or roadway. The entrance gates where primarily for the stable. The true rear of the premises was on the west. He contended that the Council had not the legal right to define the front of a building, which was to be defined by the superintending architect. He drew attention to the notice issued by the surveyor, stating that the air space must be at back or side. He did not contend that the notice could over-ride the by-laws, but was surprised such notices were not recognised by the Council after they were sent out. In delivering judgment the chairman said the question they had to decide was whether the defendant had infringed the by-laws or not. It was impossible for them to get away from the fact that the building, facing longways, going from east to west, had all the approaches to the house, stables, &c., on the south side, and they considered that to be the front of the building. Therefore the north side was the back of the building. The magistrates considered the by-laws had been infringed, and inflicted a fine of £1 and costs, or £3 17s. in all. Mr. Maynard gave notice of appeal to the Quarter Sessions.

Masters and Men.

The Bolton Tinplate Workers have struck work for an advance of 2s. per week.

The Building Trades of Aberfeldy, Dunkeld and Pitlochry. have resolved to form a local branch of the Scottish Building Trades Federation, to be called the "Atholl and Breadalbane Building Trades Association."

Carpenters' Strike at Birkenhead.—At Messrs. Laird's Works, Birkenhead, where 1000 horse stalls are being made for transport steamers to South Africa, the carpenters struck work on Monday, last week, owing to a dispute with the joiners, the complaint being that part of the work done by the joiners should be entrusted to the carpenters.

The Strike of Llanelly Copper Workers has been settled after a duration of ten weeks. The men struck work on account of the refusal of the management to reinstate one of the mill hands. During the strike the works were not entirely closed, a portion being kept going by the officials. The men have now returned to work, consenting to the employers' terms that the discharged workman should not be reinstated.

The Scottish Manufactured Iron Trade has improved recently. The Conciliation and Arbitration Board have been informed that the average realised net price at works have brought out £6 9s. 9.91d. per ton. The effect of this will be to create an increase of 2½ per cent. in the wages of the workmen, dated from 2nd October 1899, making a total increase of 17½ per cent. in the wages since the Conciliation Board was formed.

Newport Building Trade.—The letter of the Newport Building Industries Federation, offering to submit the question of labourers' wages to arbitration, provided the rule relating to working with non-unionists was withdrawn by the employers, was read before a general meeting of the Master Builders' Association. It was decided to refer the communication to the strike committee. It was reported that over 700 non-unionists were now being employed by the associated masters.

Nottingham Plasterers' Strike ended.—As the result of a conference between representatives of the National Association of Master Builders and of the National Association of Operative Plasterers, the plasterers of Nottingham, who had been on strike for a fortnight, have resumed work. The strike arose through an alleged infringement of the conditions discussed and arranged at the London Conference, following the general lock-out of plasterers throughout the country. The terms of the present settlement definitely set forth that certain kinds of work shall in future be only entrusted to plasterers.

The Hull Building Dispute.—A special meeting of the members of the Amalgamated Society of Carpenters and Joiners was held at the St. George's Hall, Story Street, last Wednesday, for the purpose of considering the proposals for the settlement of the existing dispute, which were submitted by the Hull Master Builders' Association at a conference with the operatives' delegates, and were reported in our last week's issue. The meeting was largely attended, and the proceedings, which were conducted *in camera*, were of a protracted character. Great exception was taken to the suggestion, as implied by the masters' proposals, that the present dispute should be referred to the Board of Conciliation. The men were firm on the point that they would only return to work on the understanding that the fact of their doing so put a complete end to the dispute in which they have now been engaged for practically six months. They, therefore, unanimously resolved to delete the words "both present and" from the second clause, and to make it read "and that any future difficulties shall be dealt with by such Board," instead of "and that any difficulties, both present and future," &c. Following the example of the joiners, the bricklayers and bricklayers' labourers of Hull have resolved to accept the master builders' terms of settlement on one condition, viz., that the words authorising the proposed Board of Conciliation to deal with the present dispute be deleted from clause 2 of the agreement. The position, therefore, so far as the operatives are concerned, is unchanged. They will not return to work unless the employers consent to end the dispute by reverting to the *status quo ante bellum*. Their determination not to work with imported non-unionists is as great as it was twenty-four weeks ago.

A Strike of Nail-Casters, raising an important principle, is in progress in Birmingham. The operatives object to a system which has hitherto prevailed in the trade of submitting groups of workmen to the oversight of foremen, the contention being that this leads to sweating. The operatives are employed on piecework, the pay being regulated by a scale agreed upon some time ago between themselves and the employers. Under the system of overseership a certain proportion of the earnings of each group is assigned to the foreman in charge, and this, the men contend, means that a considerable share of the money is intercepted and goes into the pockets of persons who do very little towards earning it. A vacancy having occurred among the foremen at Messrs. Healey and Peart's Works, in Vittoria Street, the men notified the employers that they would not consent to the appointment of a successor, being of opinion that the work could be equally well done under the general managerial eye, and that the proportion of earnings that had hitherto been paid to the foreman should be divided among the operatives. They did not demand the withdrawal of the other foremen employed by the firm, but indicated their intention to refuse to work under any newly-appointed foremen. The employers were unprepared to concede these terms, their contention being, it is understood, that the system of overseership is necessary to the efficient discharging of the work. In these circumstances all the casters and their assistants, to the number of forty, have come out on strike. The men are well organised, being members for the most part of the National Union of Gasworkers and General Labourers. Meanwhile Messrs. Healey and Peart are taking the opportunity of executing necessary repairs to their works.

Trade in Dundee—At the fortnightly meeting of the Dundee Trades Council, held last week—Mr. T. M'Burney, president, in the chair—an invitation was intimated from the Forfarshire and Perthshire Co-operative Conference Association to send delegates to the next meeting of the Association in Crieff. On the statement of Mr. Kirkaldy, of the Joiners' Union, that it was a waste of money, it was agreed by sixteen votes to thirteen not to be represented.—Mr. Joseph Downie stated that recently some Dundee lathers went to do a job in Inverness, and the plasterers there resenting their intrusion, came out on strike. He did not think that was fair, as the lathers formed a separate trade, and they had as much right to pursue their calling as had the plasterers. He suggested that the Trades Council of Inverness might be written to on the subject, and requested to use their influence.—Mr. M'Kenzie, a representative from the Plasterers' Labourers' Union, reported that the strike still continued, and had now lasted for eight weeks. He requested that the delegates should ask their respective societies to consider the action of the plasterers in accepting service from blackleg labour. Another delegate from the Society said the action of the plasterers was not consistent with Trades Unionism, and he asserted that service was being accepted from labourers who were provided by Græme Hunter. Mr. Douglas (Plasterers') said the Plasterers' Union had decided not to accept service from men sent by Græme Hunter, and that resolution still held good. The plasterers had no quarrel with their employers. He supposed the labourers would like the plasterers to strike on their behalf, but he was not prepared to make any statement on the subject. Several delegates condemned the action of the Plasterers' Union, and Mr. Kirkaldy said the plasterers were accepting labour from Græme Hunter's men, and they could not deny it. The plasterers in Dundee were thoroughly organised, and he believed the general feeling was that if they came out on strike they would lose their wages, and would get no benefit, because they had no dispute with their employers. The President thought the plasterers had made a mistake, and it was a pity that they had not carried out their original resolution not to accept service from men provided by Græme Hunter. He thought the plasterers ought to make some stand on behalf of the principles of Trades Unionism, and to assist the labourers in the present dispute. The subject then dropped.

Surveying and Sanitary Notes.

Yeovil Sewerage Scheme.—The Yeovil Town Council have adopted a sewage disposal scheme which the Surveyor estimates to cost £23,656.

Queen's Road Schools, Walthamstow, are being fitted with the patent tubular exhaust ventilators manufactured by John King, Limited, engineers, Liverpool.

Works of Private Street Improvements at Morecambe are proposed at a cost of £10,000, and a local government board inquiry was held by Col. Hepper recently into an application by the council for permission to borrow this sum and £500 for another steam roller.

Improvements at Cromer. — A local government board inquiry was held at Cromer on October 3rd into the application of the urban district council to borrow £3,000 for sewerage works, and £4,000 for the purchase of land on which to build council offices, a fire station, and public convenience.

Cousland's Ventilators.—Cousland's Improved Climax Patent Natural Exhaust Ventilators and direct-acting invisible roof ventilators are being used in connection with the additions now in progress at the Campbeltown Grammar School (Mr. H. E. Clifford, of Glasgow, architect). They were supplied by the Climax Ventilating and Heating Co., Ltd., 93, Hope Street, Glasgow.

Improvements at Harrogate. — On Tuesday last week Mr. W. A. Ducat held an inquiry in the council chamber, respecting an application by the Town Council to borrow £8,000, £4,000 being for additions to the Pump-room, £3,500 for street improvements in Bower Road, £300 for a covered shelter in the Valley Gardens, and £200 for a sanitary convenience on the Spa estate.

"House Building in Tropical Africa" is the title of an article in a new quarterly journal called "Climate," which is to be published shortly.

"Bleak House" for Sale. — Charles Dickens' favourite seaside residence, "Bleak House," Broadstairs, will shortly be offered for sale by public auction.

Sale of Timber, Stock, &c.—A sale of high-class builders' timber, stock, &c., will be conducted by Messrs. Joseph Hibbard and Sons, on Tuesday and Wednesday, October 17th and 18th, at 124, Shacklewell Lane, Dalston, London, N. We understand that the major portion of the timber is bone dry, having been stacked for about twelve years. The sale is due to the retirement from business of Messrs. W. Larter and Son, and is quite without reserve.

Engineering Notes.

New Brighton Pier is to be extended, at an estimated cost of £5,041.

A New Tramway at Huddersfield has just been constructed from Crosland Moor Bottom to Pinfold Well. The line is 1,170 yards in length.

The Leeds Tramway Scheme for adopting the electric overhead system for about seventeen miles of streets (referred to last week) was adopted at a meeting of the City Council on October 4th.

New Light Railway.—On October 3rd the Duke of Devonshire cut the first soil of the new light railway, projected by the North Staffordshire Railway Company, that is to run from Leebrook to Waterhouses. The capital required is £35,000.

Extensive Dock Scheme at Bristol.—The Bristol Dock Committee have decided to widen, deepen, and lengthen the present dock to enable the largest steamers to enter Portishead. This scheme is estimated to take two years to complete and to cost £350,000.

A New Pier at Southwold is now being constructed for the use of the "Belle" steamers by Messrs. A. Fasey and Son, of London. It will be of timber, 825ft. long and 30ft. wide, with a head 120ft. long and 30ft. wide. It is expected to be completed early next summer.

New Ironworks at Langloan. — The Langloan Ironworks, Coatbridge, formerly owned by Messrs. Robert Addie and Sons, after having been closed for a number of years, are to be restarted. The works have been purchased by Messrs. R. and J. Dempster, of Newton Heath, Manchester.

An Installation of Wireless Telegraphy has been established on one of the most dangerous parts of the Ushant coast between lighthouses thirty-five miles apart. The installation connects the Skiff Lighthouse on the Isle of Ushant with the new lighthouse constructed on the Ile Vierge.

The Death of Mr. John Knight, A.M.I.C.E., occurred at his residence Glen Cree, Silver Birches Road, Erdington, on Tuesday morning, last week. Mr. Knight was appointed last year engineer to the Birmingham Tame and Rea District Drainage Board. Since his summer holidays in the Isle of Man he had been suffering from what appeared to be a bad cold which culminated in pneumonia.

"The Father of Railways."—William James, the projector of the Liverpool and Manchester Railway, is (it is proposed) to have a statue erected to his memory in one of the principal railway stations of Liverpool or Manchester. It is stated that a recently discovered letter makes it quite clear that William James, and not George Stephenson, was the original projector of the railway.

Electric Lighting at Lewes.—On October 4th the Lewes Town Council adopted an agreement by which the town is to have electric light at a low rate from a good company, the ratepayers taking no risk. The company binds itself to spend £20,000, to commence laying the mains within six months, and to have the supply ready within two years from now.

Church Lighting. — Elie Free Church, Fifeshire, has just been lighted by gas incandescents supplied by the Sunlight Co., the chimneyless burner being used. These burners have white mantles when placed behind the people's backs, as in the transepts, but otherwise have a new kind of mantle called the "Acme," which is more pleasing for the eyes. Light for the pulpit itself is supplied by a cluster of burners in the corona suspended in the middle of the apse. To complete the effect, the burners have been supplied with Holophane globes, which so soften the light that the eye can detect no actual point of light.

Engineering Lectures.—The Council of the North of England Institute of Mining and Mechanical Engineers have, in collaboration with the Durham College of Science, arranged a course of engineering lectures to be delivered at the latter institution. They will extend over three winter sessions. Further information can be obtained from Mr. F. H. Pruen, Secretary, Durham College of Science, Newcastle-on-Tyne.

A New Railway.—The Bristol and South Wales Direct Railway is being rapidly pushed forward by the Great Western Railway Company. The object is to shorten and improve the route between Bristol and South Wales and London, which is done by avoiding the great curve to the south made by the present line through Bath and Chippenham. It will save eleven miles in the journey from Newport to London, while compared with the Gloucester route it is twenty-six miles shorter.

Society of Engineers.—The members and associates of the Society of Engineers recently visited the works of the Wicks Rotary Type-Casting Company, at Willesden Junction, N.W. By this machine a whole fount of type is produced by one wheel at every revolution. The segments that help to form the moulds are measured by a machine which is ten times as sensitive as a micrometer, and is so constructed that one portion only can be touched by the hand, as the heat from the hand is found sufficient to put it out of truth.

A Case about Water Certificates.—Henry Aylward, of Loxwood, was recently summoned at the instance of the Petworth Rural District Council for failing to obtain water certificates for four houses built at Loxwood. Mr. G. F. Suter, Inspector to the Council, gave evidence to the effect that the houses had been built and no certificate had been taken out. It was put forward for the defence that there were two wells to the houses, but Mr. Mant, for the prosecution, stated that the water had been examined, but was found to be unsatisfactory. If the defendant was willing to see that a proper water supply was put on, he should not press for a heavy penalty. The summons was dismissed on the payment of the costs of the application, there being a technical offence admitted, and defendant promising to make application for the certificate required, and also promising to put in a sufficient and suitable supply as required.

False Marks on Tramway Rails.—The Barrow Hermatite Steel Company were summoned at the Barrow Police Court on October 2nd under Section 1 of the Merchandise Marks Act, 1897, for putting false marks on certain tramway rails. The charge was that, in order to avoid certain testing provisions in connection with a contract for £33,000 worth of steel rails with the Sheffield Corporation, somebody had substituted for a piece of rail to be tested by the official inspector another piece, on which was the forged mark. On February 8th last, after a certain length of rail had been tested, and had withstood the drop test, two pieces were cut out by the inspector for the tensile test. Two days later the inspector attended to witness the testing, and found the pieces were not the same that he had cut off, and discovered that a false mark had been made by a forged stamp. The inspector pointed this out, secured pieces of the original rail, and though they were sufficiently good for the contract, they were inferior to the one with the forged mark. —Mr. Mellor, for the defence, said the Sheffield people got the quality of rails they had bargained for, and what had occurred was simply a technical offence under the Act. Nobody had been deceived in the slightest degree, and the company pleaded guilty because they had been unable to find out who marked the rails.—The company were fined 40s. in each case, and Court fees.

Trade and Craft.

LOW PRESSURE BOILERS.

The new catalogue of boilers for low pressure hot water and steam heating just issued by Messrs. Hartley and Sugden, Limited, Atlas Works, Halifax, contains, on page 3, a specially compiled table of boilers and cisterns for domestic hot water supply. The use of independent boilers has become so general, owing to the much more efficient and economical manner in which they do the work when compared with the ordinary range boilers, that such a sheet as that drawn up by Mr. F. Dye, C.E., M.R.I. (author of "Hood on Warming Buildings, &c."), is of great use to heating engineers and architects. The sheet indicates the sizes of boilers, cylinders, or tanks, pipes from boiler to cylinder, and approximate quantity of water per house per hour with a moderate fire. It also gives the relative value of 2in., 3in., and 4in. pipes, and the length of 4in. pipe required to warm various buildings. The book contains illustrations of a large number of very fine boilers, together with various particulars concerning them. The firm strongly recommend their wrought-welded independent dome-top boiler, with waterway bottom, No. 3E pattern, for supplying hot water to baths, lavatories, etc. It is an adaptation of their 3D pattern, but the space between the fire door and feeder is made of cast iron, instead of the usual waterway, as it has been found in some districts that sediment is liable to collect very quickly in the waterway over the fire door, and unless often removed, permanently injures the boiler. All the boilers made by the firm are tested under heavy hydraulic pressure before leaving the works.

New Town Hall for Norwich.—The Norwich Town Council recently decided, at a special meeting, not to make any adaptation of the present offices, but to build a new Town Hall.

Carpenters' Company Scholarships.—The two scholarships offered by the Carpenters' Company in connection with the building construction classes at King's College, Strand, were competed for on the evening of September 27th. There were more candidates than in former years. The two successful students were Messrs. Francis Hartnoll and Frederick Jones.

Architectural Craftsmen's Society. — The opening meeting of the Glasgow and West of Scotland Architectural Craftsmen's Society will be held in room No. 4 at 204, George Street, Glasgow, on Friday, October 13th, at 8 p.m., when Professor Sexton, F.C.S., F.I.C., will deliver a lecture on "Mild Steel." The syllabus for the coming session is an interesting one.

Aberdeen University Buildings are to be extended, and Mr. A. Marshall Mackenzie, the architect, submitted a report on the subject to a meeting of the University Court recently. The cost of what is called the popular plan, with Greyfriars Church erected at Queen Street, he estimates at £45,000; the modified popular plan, with the church on the Parliamentary site, at £40,000; restoration scheme, £27,000; and south extension, with the rebuilding of Greyfriars' in front of Mitchell Tower, £32,000. The Court came to a finding that any one of the plans would afford sufficient accommodation for the present wants of the University, and agreed to submit plans and the architect's report to the Joint Committee of the University Court for their information. A meeting of the Joint Committee was fixed for that purpose.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—		
Oct. 13	Great Harwood, Lancs.—Masonry and Walls	District Council	R. Chippendale, Clerk, Great Harwood, Lancs.
,, 13	Guildford—Repair to Workhouse	Guardians	Peak and Lunn, 36, High-street, Guildford.
,, 13	Huddersfield—Generating Station, &c.	Corporation	Borough Engineer, 1, Peel-street, Huddersfield.
,, 13	Skerton, Lancaster—Church	....	Rev. P. O'Bryen, Slyne-road, Skerton, Lancaster.
,, 13	Leicester—Cemetery Buildings, &c.	Corporation	Goddard and Co., 6, Market-street, Leicester.
,, 14	Bootham, York—School Blocks	....	W. H. Thorpe, 61, Albion-street, Leeds.
,, 14	Winchcombe—Police Station	Gloucester Standing Joint Committee	M. H. Medland, 15, Clarence-street, Gloucester.
,, 14	Watford—School	School Board	W. H. Syme, 4, High-street, Watford, Herts.
,, 14	Edinburgh—Supply of Bricks	Gas Commissioners	— Herring, Manager, New Street Gas Works, Edinburgh.
,, 16	Bickington, Newton Abbot—Dwelling-house	J. Honywill	S. Segar, Architect, Union-street, Newton Abbot.
,, 16	Kingsteignton, Devon—Dwelling-house	W. Raymont	S. Segar, Architect, Union-street, Newton Abbot.
,, 16	Mellis, Suffolk—School Buildings	Parochial School Managers	R. Stammers, White Lion Hotel, Mellis.
,, 16	Morecambe—Works	Tower Company	W. H. and A. Sugden, Architects, Keighley.
,, 16	Newry, Ireland—21 Artisans' Dwelling-houses	Urban District Council	R. H. Doherty, Clerk, Town Hall, Newry.
,, 16	Wimbledon—Ten Workmen's Dwellings	Urban District Council	C. H. Cooper, Council's Surveyor, The Broadway, Wimbledon.
,, 16	Barking—School Classrooms	School Board	C. J. Dawson, Architect, East-street, Barking.
,, 16	Kingwood Hill, near Bristol—Engine House and Foundations.	West Gloucestershire Water Co.	E. D. Marten, Engineer, The Birches, Codsall, Wolverhampton.
,, 17	London, S.E.—Alterations, &c., to Workhouse	St. Olave's Union Guardians	Newman and Newman, 31, Tooley-street, E.C.
,, 17	Kirby Misperton—Widening, &c., Stone Bridge	....	W. Stead, County Surveyor, Northallerton.
,, 18	Burnley—Buildings, &c.	Gas Committee	J. P. Leather, Gas Works, Burnley.
,, 18	King's Lynn—Infectious Diseases Hospital	Sanitary Committee	H. J. Weaver, Borough Engineer, Town Hall, King's Lynn.
,, 18	Isleworth—Workhouse	Brentford Union Guardians	W. Stephens, Clerk, Union Offices, Isleworth, W.
,, 18	Isleworth—Mortuary at Infirmary	Brentford Union Guardians	W. H. Ward, Architect, Paradise-street, Birmingham.
,, 19	Sheffield—Showrooms, Offices, &c.	T. W. Ward	E. Winder, jun., Architect, Wharf-street, Sheffield.
,, 21	Farnborough—Police Cottages	....	W. J. Taylor, County Surveyor, The Castle, Winchester.
,, 24	Romford—Isolation Wards at Hospital	Joint Hospital Board	— Whitmore, 17, Duke-street, Chelmsford.
,, 25	Swansea—Extension of Workhouse	Union Guardians	G. B. Haynes, 8, Fisher-street, Swansea.
,, 26	Sandgate—Public Convenience	Urban District Council	A. R. Bowles, Engineer, Surveyor's Office, Sandgate.
,, 27	London, S.W.—Retaining Walls and Foundations to New War Office	H.M. Commissioners of Works and Public Buildings	Sir J. Taylor, H.M. Office of Works, Storey's-gate, S.W.
,, 31	Sandown, Isle of Wight—Higher Grade School	Brading School Board	J. Newman, Architect, Thornton, Sandown.
Nov. 1	Myton-on-Swale, Yorks.—School	....	W. Ward, Myton Hall, Helperby.
,, 3	Padstow, Cornwall—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.
,, 3	Banff, N.B.—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.
,, 7	Walthamstow—School Buildings	School Board	W. A. Longmore, Bridge-chambers, Hoe-st., Walthamstow.
,, 7	Enfield—Girls' Department and Assembly Hall	School Board	G. E. T. Laurence, 181, Queen Victoria street, E.C.
,, 7	London, W.—Female Staff Home, &c., &c., at Infirmary	St. George's Union Guardians	E. T. Hall, 57, Moorgate-street, E.C.
No date.	Tottenham—Six-room Houses	....	S. Ford, 3, South-square, Gray's Inn, W.C.
	ENGINEERING—		
Oct. 14	Farnham—Alterations, &c., to Gasholder Tank	Gas Company	G. McDonald, 104, West-street, Farnham.
,, 14	Tiflis—Tramways Concession	Town Council	Managing Department of Council, Tiflis, Transcaucasus.
,, 14	Milford, Ireland—Sinking Well and Erecting Pump	Rural District Council	S. Walters, Clerk, Council Offices, Milford.
,, 14	Warrington—Steam Engines at Waterworks	Corporation	J. Deas, Engineer, Bank House, Warrington.
,, 16	Great Torrington—Waterworks	Corporation	B. Latham, 13, Victoria-street, Westminster.
,, 18	Leeds—50 Electric Tramcars	City Council	T. Hewson, City Engineer, Municipal Buildings, Leeds.
,, 18	Purton, Wilts—Waterwoks	Rural District Council	F. Redman, Engineer, Newport-street, Swindon.
,, 18	London, E.—Boilers, Pumps, Tanks, &c.	Poplar Union Guardians	F. J. Warden-Stevens, 34, Victoria-street, Westminster.
,, 19	Innellan, Scotland—Extension of Pier	....	D. and C. Stevenson, 84, George-street, Edinburgh.
,, 24	Gloucester—Refuse Destructor, &c.	Electricity Supply Committee	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 24	Barking, Essex—Light Railway Plant	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
,, 25	Wigan—Electric Lighting	Corporation	H. C. Bishop, Borough Electrical Engineer, Wigan.
,, 30	Stonehaven—Harbour Extension	Harbour Trustees	J. Barron, 1, Bon Accord-street, Aberdeen.
,, 31	Chipping Campden—Waterworks	Rural District Council	N. Lailey, 16, Great George-street, Westminster.
Nov. 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
,, 30	Port Elizabeth—Railway	....	General Manager of Railways, Capetown.
Jan. 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
	IRON AND STEEL—		
Oct. 14	Nottingham—Steel Girder Tramrails, &c.	City Council	A. Brown, City Engineer, Guildhall, Nottingham.
,, 17	Heywood—Gasmeters	Gas Committee	W. Whatmough, Gas Manager, Municipal-bldgs, Heywood.
,, 17	Salford—Tramway Poles	....	L. C. Evans, Clerk, Town Hall, Salford.
,, 18	Christiania, Norway—Steel Rails and Fishplates	State Railways Administration	Commercial Department, Foreign Office, S.W.
,, 23	London, W.—Railway Stores	Great Western Railway Co.	Stores Superintendent, G.W.Rly. Station, Swindon.
,, 25	Wigan—Cast-iron Boxes, Frames, &c.	Corporation	H. C. Bishop, Borough Electrical Engineer, Wigan.
	PAINTING AND PLUMBING—		
Oct. 16	Wrexham—Painting Market	....	Borough Surveyor, Wrexham.
,, 18	London, S.E.—Painting and Decorating Workhouse Dining Hall	St. Leonard's Parish Guardians, Shoreditch	F. J. Smith, Architect, Parliament Mansions, Victoria-street, Westminster, S.W.
	ROADS AND CARTAGE—		
Oct. 13	Preston—Road Works	Corporation	Borough Surveyor, Town Hall, Preston.
,, 16	Morthoe, Devon—Laying-out Burial Ground	Parish Council	E. Henshall, Engineer, Woolacombe, North Devon.
,, 16	Guildford—Broken Granite	Town Council	C. G. Mason, Borough Surveyor, Tuns-gate, Guildford.
,, 16	Wimbledon—Making-up roads	Urban District Council	Council's Surveyor, The Broadway, Wimbledon.
,, 16	Wimbledon—Roughing Gravel	Urban District Council	Council's Surveyor, The Broadway, Wimbledon.
,, 18	Balby-with-Hexthorpe, Yorks.—Forming, &c., Streets	Urban District Council	G. Gledhill, Surveyor, High-road, Balby.
,, 18	Watford—Broken Granite	Urban District Council	H. M. Turner, 14, High-street, Watford.
,, 18	Plumstead—Two Wielacy's Sanding Machines	Vestry	Surveyor, Vestry Hall, Maxey-road, Plumstead.
,, 20	Walthamstow—Granite Kerb and Setts	Urban District Council	G. W. Holmes, Engineer, Town Hall, Walthamstow.
,, 21	Bishop's Stortford—Broken Flint Gravel	Urban District Council	Surveyor, Council Offices, North-street, Bishop's Stortford.
,, 21	Bishop's Stortford—Broken Granite, &c.	Urban District Council	Surveyor, Council Offices, North-street, Bishop's Stortford.
,, 21	Grimsby—Road Formation, &c.	G. S. Stephenson	W. Waller, 243, Freeman-street, Grimsby.
,, 23	Little Hulton, Lancs.—Road Improvement Works	Urban District Council	C. C. Hooley, 34, Brazenose-street, Manchester.
,, 24	Dover—Street Works	Town Council	H. E. Stilgoe, Borough Engineer, Town Hall, Dover.
	SANITARY—		
Oct. 19	Croydon—Drain Pipes, &c.	Town Council	Borough Surveyor, Town Hall, Croydon.
,, 24	Exmouth—Sewers, &c.	Urban District Council	J. Mansergh, 5, Victoria-street, Westminster.
Nov. 10	Darton, Yorks.—Sewerage Works	Urban District Council	W. H. Radford, Pelham-chambers, Angel-row, Nottingham.
	TIMBER—		
Oct. 14	Spezia—Teak Wood	Arsenal Authorities	Commercial Department, Foreign Office, S.W.
,, 17	Stafford—Creosoted Pine Wood Fencing, &c.	Common Lands Committee	G. H. Smallman, 29, Goalgate-street, Stafford.
,, 23	London, E.C.—Telegraph Poles	Post-Master General	C. E. Stuart, Controller of Stores, General Post Office, E.C

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct. 16	Paignton, Devon—Pavilion on Recreation Ground	£15, £5	G. Barnston, Clerk to U.D.C., Town Hall, Paignton.
,, 17	Blackpool—School for 1000 Children	....	T. Loftos, Clerk to School Board, Town Hall, Blackpool.
,, 28	Elland—Baths	2nd Premium £20, 3rd Premium £10	Clerk to Urban District Council, Offices, Elland.
Nov. 1	Horley, Surrey—Fire Engine Station	£10	R. L. Lowe, Clerk to Parish Council, Horley.
,, 30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *viâ* New York.
Dec. 1	Bury, Lancs.—Infectious Diseases Hospital	£100, £50, £25	Borough Engineer, Corporation Offices, Bury

Property and Land Sales.

FREEHOLD BUILDING ESTATE, fronting on main road and close to golf links and Highgate Woods, seven minutes' walk from Muswell Hill and East Finchley stations. To be LET on lease or SOLD in plots. Liberal advances to responsible builders if required. For plans and particulars, apply to Mr. George H. Paine, Architect and Surveyor, 6, Stoke Newington-road, N. 2

In the City of London.

Most important BUILDING SITE, situate on the east side of Finsbury-pavement, nearly opposite Moorgate-street Station and the Station now being erected on the City and South London Electric Railway. The site is covered with the houses numbered 42, 44, 46, 48, 50, and 52, Finsbury-pavement, and 1A and 2, South-place.

The site has a frontage of 166ft. to Finsbury-pavement, another frontage to South-place of 109ft., and it is bounded in the rear or east side by a paved yard, to which it has frontage and cart access. The superficial area is 16,750ft., and the entire site can be utilised, as it is exceptionally free from rights of light appertaining to adjacent properties, and it is admirably suited either for shops with offices over, or for banks, insurance offices, or public companies.

The above will be LET by AUCTION by

DANIEL WATNEY and SONS, by direction of the Fishmongers' Company, Governors of Holt School, and with the approval of the Charity Commissioners, at the Mart, Tokenhouse-yard, E.C., on THURSDAY, NOVEMBER 2nd, 1899, at TWO o'clock precisely.

Particulars, with plan and conditions of letting, may be had either of Mr. J. Wrench Towse, Fishmongers' Hall, London Bridge; Mr. C. O. Humphreys, Giltspur-chambers, Holborn-viaduct; Mr. Howard Chatfeild Clarke, the Company's Surveyor, 63, Bishopsgate-street-within; and of the Auctioneers, Messrs. Daniel Watney and Sons, 33, Poultry, E.C. 1

SALE DAYS for the Year 1899.
Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, Oct. 12
Thursday, Oct. 26
Thursday, Nov. 16
Thursday, Nov. 23
Thursday, Dec. 7
Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

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In connection with an Examination to be held at Carpenters' Hall on NOVEMBER 30th and DECEMBER 2nd, will be delivered as follows:—

Date, 1899.	Lecturer.	Subject and Synopsis.
		Site, Foundations, and Sanitary Requirements.
Thursday, Oct. 12th	Professor T. ROGER SMITH, F.R.I.B.A.	What is needed to make a Building a healthy one. Sanitary precautions as to Healthiness of Site and the sufficiency of Air Space about Buildings, Light, &c. Construction of Foundations, especially when the bottom is bad or under water.
Thursday, Oct. 19th	Professor HENRY ROBINSON, M. Inst. C.E.	Sanitary Arrangements of Buildings, the construction of Water Closets, Privies, and Dry Closets, Water Supply, Water Tanks and Services, and Plumbers' Work. The Essentials and Details of Good Drainage; the various kinds of Pipes, Pipe Laying; Ventilation of Drains and Testing of Drains; Dealing with old Drains.
		Sanitary Construction, Warming, and Ventilation.
Thursday, Oct. 26th	THOMAS BLASHILL, Esq., F.R.I.B.A.	The Properties and Qualities of Building Materials and modes of using them. Timber: its decay and preservation.
Thursday, Nov. 2nd	KEITH D. YOUNG, Esq., F.R.I.B.A.	Principles of Ventilating and Warming Buildings.
		Setting Out Work and Bye-Laws.
Thursday, Nov. 16th	JAMES BARTLETT, Esq., M.S.A., Demonstrator, King's College.	Principles of Calculating Areas, Cubic space; Interpretation of Drawings to Scale; Methods of Setting out Work, Checking Levels. Knowledge of the Acts of Parliament relating to Buildings. The Model Bye-laws issued by the Local Government Board, so far as they relate to the subjects of the Examination.

These Lectures are primarily intended for Candidates for the present or future Examinations, and are Illustrated by Take-to-pieces Models, large Diagrams, Photographs, and Specimens of Materials.

Lectures commence at 7.30 p.m.

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- "THE COLLECTOR" SUPPLEMENT: No. IV.: THE IVORIES IN THE LOUVRE AND CLUNY MUSEUMS: Written by Emile Molinier, Director of the Louvre.
- THE BAPTISTERY OF SAINT JOHN IN FLORENCE: Written and Illustrated by Charles Godfrey Leland.
- ATTAINABLE IDEALS: By James A. Morris. Illustrated with Working Drawings by J. D. Sedding. Part II.
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		s.	d.	£	s.	d.
Per foot super.	2in. framed, ledged, and braced door, covered one side with ¾in. ploughed and tongued and beaded or V-jointed match boarding	0	9	0	1	8
Per foot super.	2½in. framed, ledged, and braced door, covered with 1in ploughed and tongued and V-jointed both sides match boarding	0	11	0	2	10
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Per foot super.	1in. square framed, one panel door	0	5½	0	0	11½
Per foot super.	1in. bead butt, or moulded and square, one panel door	0	5¾	0	1	1
Per foot super.	1in. bead flush and square, one panel door	0	6	0	1	1
Per foot super.	1in. bead butt and moulded, one panel door	0	6	0	1	2
Per foot super.	1in. square framed, two panel door	0	6	0	1	1
Per foot super	1in. bead butt, or moulded and square, two panel door	0	6½	0	1	1½
Per foot super.	1in. bead flush and square, two panel door	0	7	0	1	1½
Per foot super.	1in. bead, butt and moulded, two panel door	0	7	0	1	2½
Per foot super.	1½in. square framed, one panel door	0	5	0	1	2
Per foot super.	1½in. bead butt or moulded and square, one panel door	0	5½	0	1	3
Per foot super.	1½in. bead flush and square, one panel door	0	6	0	1	3
Per foot super.	1½in. bead butt and moulded, one panel door	0	6	0	1	4
Per foot super.	1½in. stop chamfered and square, one panel door ...	0	5	0	1	3
Per foot super.	1½in. square framed, two panel door	0	6	0	1	3
Per foot super.	1½in. bead butt or moulded square, two panel door ...	0	6½	0	1	4
Per foot super.	1½in. bead flush or square, two panel door	0	7	0	1	4
Per foot super.	1½in. bead butt and moulded, two panel door	0	7	0	1	5
Per foot super.	1½in. stop chamfered and square	0	6	0	1	4
Per foot super.	Any of above, with bolection mouldings, extra ...	0	0	0	0	2

TWO PANEL DOORS.

		s.	d.	£	s.	d.
Per foot super.	1in. deal, square framed ..	0	3	0	0	10
Per foot super.	1½in. deal, square framed ...	0	3½	0	0	11
Per foot super.	1½in. bead butt and square	0	4	0	1	0
Per foot super.	1½in. bead flush and square	0	5	0	1	1
Per foot super.	1½in. moulded and square	0	6	0	1	1
Per foot super	1½in. bead butt both sides ..	0	6½	0	1	1½
Per foot super.	1½in. bead butt and bead flush	0	7½	0	1	2
Per foot super.	1½in. bead flush both sides	0	8	0	1	2½
Per foot super.	1½in. bead flush and moulded	0	8	0	1	3
Per foot super.	1½in. stop chamfer and square	0	6	0	1	1
Per foot super.	1¾in. deal, square framed ...	0	4	0	1	0
Per foot super.	1¾in. bead butt and square	0	5	0	1	1
Per foot super.	1¾in. bead flush and square	0	6	0	1	2½
Per foot super.	1¾in. moulded and square ...	0	6	0	1	3
Per foot super.	1¾in. bead butt both sides ...	0	6½	0	1	3
Per foot super.	1¾in. bead butt and bead flush	0	6½	0	1	4
Per foot super.	1¾in. bead flush both sides	0	7½	0	1	4
Per foot super.	1¾in. bead flush and moulded	0	8	0	1	5
Per foot super.	1¾in. moulded both sides ...	0	7	0	1	4
Per foot super.	1¾in. moulded one side, bead butt other	0	7	0	1	4
Per foot super.	1¾in. moulded one side, bead flush other	0	8	0	1	4½
Per foot super.	Any of above with raised panels, extra	0	1	0	0	1½
Per foot super.	Any of above with bolection mouldings, extra ...	0	1	0	0	2
Per foot super.	Doors of any of above descriptions, but with three panels instead of two, should be priced extra to the above prices ...	0	2	0	0	2

Two Panel Doors in Woods other than Deal.

Prices per foot superficial including all materials.

		Pitch Pine.		Sequoia.		Honduras Mahogany.		Walnut.		Teak.		Spanish or Cuba Mahogany.	
		s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Per foot super.	1in. 2-panel square framed doors	1	2½	1	6	2	8	2	10	3	0	3	5
Per foot super.	1in. 2-panel bead flush and square doors ...	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super	1in. 2-panel moulded and square doors ...	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super.	1in. 2-panel moulded and bead flush doors ...	1	5	1	8	3	1	3	3½	3	6	3	10
Per foot super.	1in. 2-panel bead flush both sides, doors ...	1	5½	1	8½	3	1½	3	5	3	7½	4	2
Per foot super.	1½in. 2-panel square framed doors	1	4½	1	7	2	10½	3	1	3	4	3	9½
Per foot super.	1½in. 2-panel bead flush and square doors ...	1	5	1	8	3	1½	3	5	3	7½	4	2
Per foot super.	1½in. 2-panel moulded and square doors ...	1	5½	1	8	3	1½	3	5	3	5½	4	2½
Per foot super.	1½in. 2-panel moulded and bead flush doors ...	1	6	1	8	3	2½	3	5½	3	10	4	2½
Per foot super.	1½in 2-panel bead flush both sides doors ...	1	8	1	10½	3	4	3	7	3	11	4	5½

FOUR-PANEL DOORS.

		Labour only.		All materials and labour.		
		s.	d.	£	s.	d.
Per foot super.	1in. deal, square framed ...	0	3½	0	0	11
Per foot super.	1½in. deal, square framed ...	0	4	0	1	0
Per foot super.	1½in. bead butt and square	0	4½	0	1	1
Per foot super.	1½in. bead flush and square	0	5½	0	1	2
Per foot super.	1½in. moulded and square	0	6½	0	1	2
Per foot super.	1½in. bead butt both sides ...	0	7	0	1	2½
Per foot super.	1½in. bead butt and bead flush	0	8	0	1	3
Per foot super.	1½in. bead flush both sides	0	8½	0	1	3½
Per foot super.	1½in. bead flush and moulded	0	8½	0	1	4
Per foot super.	1½in. stop chamfered and square	0	6½	0	1	2
Per foot super.	1¾in. deal, square framed ...	0	4½	0	1	1
Per foot super.	1¾in. bead butt and square	0	5½	0	1	2
Per foot super.	1¾in. bead flush and square	0	6½	0	1	3½
Per foot super.	1¾in. moulded and square ...	0	6½	0	1	4
Per foot super.	1¾in. bead butt both sides	0	7	0	1	4
Per foot super.	1¾in. bead, butt and bead flush	0	7	0	1	5
Per foot super.	1¾in. bead flush both sides	0	8	0	1	5
Per foot super.	1¾in. bead flush and moulded	0	8½	0	1	6
Per foot super.	1¾in. chamfered both sides	0	7	0	1	2
Per foot super.	1¾in. stop chamfered and square	0	7	0	1	3
Per foot super.	1¾in. stop chamfered both sides	0	7½	0	1	3½
Per foot super.	1¾in. stop chamfered and moulded	0	7½	0	1	3½
Per foot super.	1¾in. moulded both sides ...	0	8	0	1	5
Per foot super.	Any of above with raised panels, extra	0	1	0	0	2
Per foot super.	Any of above with bolection mouldings, extra ...	0	1½	0	0	2
Per foot super.	Any of above with upper panels quirk - moulded, extra	0	1½	0	0	2
Per foot super.	2in. square framed doors ...	0	5½	0	1	3
Per foot super.	2in. bead butt and square ..	0	6	0	1	4
Per foot super.	2in. bead flush and square...	0	7	0	1	5
Per foot super.	2in. moulded and square ...	0	7	0	1	5½
Per foot super.	2in. bead butt both sides ...	0	7	0	1	5½
Per foot super.	2in. bead butt and bead flush	0	7½	0	1	5½
Per foot super.	2in. bead flush both sides ...	0	8	0	1	7
Per foot super.	2in. bead flush and moulded	0	7½	0	1	8
Per foot super.	2in. chamfered both sides ...	0	7½	0	1	3
Per foot super.	2in. stop chamfered and square	0	6½	0	1	4

285

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REDUCED *FAC-SIMILE* PAGE OF SPECIFICATION CLAUSES.

Continuation of **Specification.** *Concretor.*

WORKMANSHIP.

GENERALLY.

24. Proportions. Proper boxes or measures must be provided for accurately measuring the proportions of the various materials for the concrete. Such proportions to be ascertained by actual measurement at each mixing.

25. Mixing. The materials for the concrete are to be mixed by first filling a cubic yard or other suitable measure with the aggregate, then adding the cement (which must be separately measured). The whole to be twice turned over dry, then shovelled into a third heap, at the same time adding from the rose of a watering-pot sufficient water only to make the ingredients cling together. The materials to be again turned over in a wet condition before being removed and deposited in position. All necessary precautions must be taken to prevent the cement being blown away during the mixing.

26. Porous materials to be wetted. The whole of the coke breeze, broken brick, stone, or other porous aggregate to be well wetted with water before mixing, turned over, and allowed to drain, so that the surfaces may be damp, but not wet, when required for use.

27. Concrete to be freshly made. The concrete is to be mixed in convenient quantities to suit the requirements of the work. The chopping up and use of concrete or cement which has begun to set will not be permitted.

28. Levelling. All concrete when deposited in position is to be carefully levelled or laid to falls as may be required, and brought to an even and finished state.

29. Setting. Every care must be taken not to disturb the concrete whilst setting. In all cases where it is found absolutely necessary to pass over newly formed concrete, planks are to be carefully laid down.

30. Work prohibited during frosty weather. No concrete work shall be executed during frosty weather, nor even if there shall be any probability of a frost occurring before the concrete has had sufficient time to set.

FOUNDATIONS.

31. Concrete in Trenches. The concrete to be lowered into the trenches and not thrown in. After the concrete has been deposited in position it is to be well worked against the sides of the trenches by means of a spade or trowel, lightly rammed with wooden beaters, properly levelled, and brought to an even surface.

32. Building on Concrete. An interval of seven days (or such other period as may be directed) is to elapse between the completion of the concrete foundations and the commencement of any building upon them.

UNDER BOARDED FLOORS.

33. Laying. The concrete to be 6in. in thickness, lightly rammed with wooden beaters until the moisture rises to the surface, floated to a smooth and even face and finished to proper falls or levels.

UNDER TILE OR OTHER PAVEMENTS.

See Clause 33.

PAVING.

34. Laying. The concrete paving to be 6in. in thickness, finished with a granite surface, and smoothly floated to proper falls or levels.

35. Granite Surface. The surface of the concrete paving to be formed with a layer of granite concrete 1in. in thickness, lightly rammed with wooden beaters and floated to a perfectly smooth and even face. The entire thickness of the paving to be laid and finished in one operation.

36. Expansion Boards. Provide and fix expansion boards or slips at intervals of every 12ft., including removing same at completion, filling up the cavity with concrete and making good the surface.

37. Watering Surfaces. The finished surface of the concrete to be kept damp for at least seven days (or fourteen days) after being laid, by covering with wet sand or sawdust. The sand or sawdust to be kept moist during the period named by frequently sprinkling it with water from the rose of a watering-pot.

38. Protection. The concrete surfaces to be properly protected from any injury that might be caused by passing traffic, falling materials, etc.

39. Freedom from Discolouration. The surface of the concrete paving to be of uniform colour throughout, and free from any stain, discolouration, or other defect.

40. Surface Channels. Surface channels, having a shallow curved section, to be formed in the concrete paving where shown on the drawings. To be laid to proper falls, and neatly dished round the top of each gully

UPPER FLOORS.

41. Laying. The concrete to be hoisted to the required height, and carefully filled in between the rolled steel (or iron) joists to a depth of 9in. (or other specified thickness), lightly rammed with wooden beaters, and levelled and floated to an even surface. Each concrete floor is to be laid and completed at one operation, the necessary arrangements being previously made for carrying on the work without cessation.

42. Watering Surfaces. *See* Clause 37.

43. Sheeting. Provide and fix proper deal rough (or wrought) flat sheeting, with flush joints, including all necessary supports and strutting that may be required, and remove at completion.

43a. Alternative Clause. Provide and fix proper deal rough (or wrought) sheeting on proper centres or turning pieces, and of the curvature shown on the drawings. To include all necessary supports and strutting that may be required, and remove at completion.

44. Removal of Sheeting. The sheeting, &c., is not to be disturbed for a period of at least fourteen days after the concrete has been laid (or such other period as may be considered necessary), and it shall not be removed without first obtaining the sanction of the architect (or engineer) in writing.

45. Sheeting to be Wetted. The upper surface of the sheeting to be well wetted from the rose of a watering-pot before depositing the concrete upon it.

WALLS, PARTITIONS, STANCHIONS, Etc.

46. Depositing. The concrete to be carefully deposited in position, and lightly rammed between the casing and around the iron or other cores as shown on the detail drawings.

47. Girders and Stanchions. All projecting girders and stanchions to be similarly encased with concrete where required.

48. Casings. Provide and fix proper deal casings with flush points, including all necessary timbering and strutting, and remove at completion.

48a. Moulds. Provide and fix proper moulds to all bull-nosed angles, reveals for door frames, chases, and recesses where shown on detail drawings, and remove at completion.

49. Removal of casings. The casings and moulds shall not be removed until the concrete has thoroughly set.

LINTELS.

50. Moulded Work. The concrete for lintels to be filled into properly constructed moulds or boxes and well worked around the iron or other cores as shown on the detail drawings. The lintels to be made 18in. longer than the opening over which they are to be fixed, so that they may rest 9in. on the wall at each end. To be 9in. in depth for all spans not exceeding 4ft., and 12in. in depth for all spans exceeding 4ft. and not exceeding 6ft.

51. Cores to be Embedded. All lintels having a bed or width not exceeding 9in. to have a core consisting of a 3in. × 3in. rolled steel (or iron) joist weighing 10lb. per foot run properly embedded in the same. An additional joist to be added for every additional 9in. in width or bed of lintel.

52. Seasoning. The concrete lintels to be left in the moulds until properly set, and to be made at least six weeks before being required for building into position.

53. Moulds. Provide all necessary moulds, casings, and patterns that may be required for the proper construction of the concrete lintels as shown on the detail drawings.

BRICKS.

54. Fixing Blocks. Breeze bricks to be built into the walls where shown on drawings or otherwise directed for the proper fixing of joinery, etc. The concrete to be filled into suitable moulds and allowed sufficient time to set and harden before being used.

SEA AND RETAINING WALLS.

55. Concrete to be carried up uniformly. The concrete to be carried up uniformly over the whole area embraced in each section under construction, no part to be more than 3ft. higher than another. To be laid in horizontal courses not exceeding 18in. deep.

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Supplement to the Builders' Journal and Architectural Record, *October 11th*, 1899.

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THE BVILDERS' JOVRNAL
&
ARCHITECTVRAL RECORD
WITH SVRVEYING AND SANITARY SVPPLEMENTS

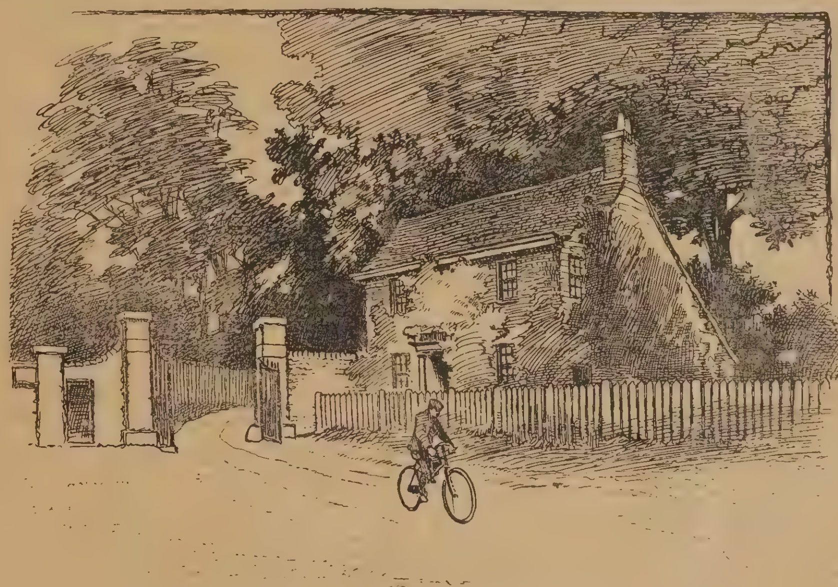
October 18, 1899.
No. CCXLV.

Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

Changes in Richmond Park. Many changes have taken place in Richmond Park during the last few years. Once a comparative solitude within hail of town, the suburbs have crept up to its borders, and with their advent has come a vastly increased public use of these fine stretches of bracken and ancient woodlands. There used to be but few public and unrestricted entrances into Richmond Park, but the private and semi-private gates have one by one been fully opened to traffic in response to the memorials presented to the Ranger by local residents; and existing gates which have proved dangerously narrow for the increased and increasing traffic have been widened. Two years ago, the principal gate—that known from its neighbourhood to the famous Star and Garter Hotel on Richmond Hill as the "Star and Garter" Gate—was thus set back; and now Roehampton Gate is being reconstructed. Until a year ago, the narrow entrance to the Park at Roehampton from Priory and Clarence Lanes and Barnes was strictly reserved for the use of residents in those lanes, themselves secluded from public use by barriers across either end. A year ago, in response to a long-continued agitation, these lanes and the Gate itself were freely thrown open, and since that time this short route from Barnes to Richmond has developed a crowded stream of traffic which has proved the Gate to be altogether inadequate for these new requirements. At the same time, the picturesquely tree-shaded lodge beside it has shown signs of settling on its foundations, and will shortly be demolished. Meanwhile, a new red-brick lodge has been rising on the opposite side of the pathway, and is nearly completed, and the old Gate has just been torn down. Our illustration will help toward preserving a record of the place before it has utterly faded from recollection. The new Gate will be at least three times the width of the old, and, instead of brick piers, will have ornamental open ironwork, which will have the very great advantage of enabling drivers to obtain a view ahead on coming round the sharp curves in the lane leading to this spot.

C. G. H.



ROEHAMPTON GATE, RICHMOND PARK. DRAWN BY C. G. HARPER.

The Statues of London. To an artistic-minded person well acquainted with the streets of London, the statues in many of the better known thoroughfares must be cause for grave thought. There are many fine squares, parks, and arteries which are a credit not only to our own city, but would be so if they were in any other part of the world; but can the same be said of many of the memorials to the great dead and living? When the statues do not themselves err in the matter of good taste, their surroundings and the circumstances of their situation are such that they frequently excite ridicule rather than admiration. There is that latest statue of the Queen at the eastern end of the Victoria Embankment. This is a very good statue in its way, though Her Majesty looks a trifle wooden, both in attitude and expression. It would look well on a lawn of a country house or in a small park, but placed where it is it is totally obliterated, not only by the huge buildings on two sides, but by the noble riverside thoroughfare and Blackfriars Bridge, which itself possesses many pedestals still untenanted by the statuary for which they were originally intended. A similar remark applies, perhaps less forcibly, to the equestrian statue of the Prince Consort in Holborn Circus, where the Prince is shown saluting the City Temple, for St. Andrew's Church is hidden very effectually behind piles of business premises. With the huge trading emporiums that form the walls of the Circus, the diminutive statue, which recalls a Lowther Arcade soldier on his "tin gee-gee," is entirely out-of-keeping and lost. Again, there is the statue of Brunel on the Victoria Embankment, which has been placed as an ornament at the end of a ventilator for the District Railway, where, in the company of a couple of volutes, a heavy wall, and a seat, it gazes blankly on the passing traffic and the river. Of all the statues in London which have been spoilt by their surroundings, this is pre-eminent. To make this memorial to one of England's greatest engineers at all effective, the surrounding wall and accompanying volutes should be removed, or the statue taken down and re-erected elsewhere—say in one of the adjoining gardens.

Taking now another statue which has been in our midst for many years, that of Richard Cœur de Lion, in Palace Yard, Westminster. Though it is a good piece of sculpture it is most unfortunately placed, as much of its beauty is really lost through being too close to the walls of the palace of St. Stephen. In order that this statue might be truly appreciated it should be placed in the centre of the roadway, where it would have, on one side the grand old Abbey Church of St. Peter's, Henry the Seventh's Chapel, and St. Margaret's Church, and, on the other the House of Lords, with its noble Victoria Tower filling up the vista looking west. It would not be costly to remedy the defect, as the statue could be very easily moved into its new position. A similar state of affairs exists at Knightsbridge with regard to the statue of Lord Strathnairn, now that the new buildings at Albert Gate are assuming colossal proportions. The writer could never understand why, as a military memorial, it was not set up on the park side of Knightsbridge Barracks. The Griffin, that German stove ornament marking the site of old Temple Bar, is quite out of place in Fleet Street and the Strand, and ought to be speedily removed.

At the entrance to the Lady's Mile in Hyde Park there is a statue of Lord Byron, which, so far as the bronze figure is concerned, is satisfactory enough; but its stone base is too large and heavy, while the name "Byron" is cut in a style that is almost illegible. Besides these—and the list could be extended—there are many statues in the squares of London which, behind their encircling iron railings, look for all the world like prehistoric specimens preserved in decay. Many of these could well be removed to more appropriate sites and surroundings. In conclusion, the writer would suggest that a commission be appointed, say of seven members, made up of sculptors, painters, architects, a gardener, and, perhaps, a qualified layman, to take the matter in hand, and give the statues of the metropolis a thorough overhauling. This would be a beneficial reform, and one that is badly needed. W. N. B.

Our Older High Buildings.

ALTHOUGH the general adoption of Chicago architecture in the capital is a prospect which cannot be regarded without dismay, and even the individual "skyscraper," or an attempt in that direction, is at present a most disturbing element when introduced amidst old European surroundings, some increase in the altitude of buildings is inevitable if the present rapid increase of our urban population is continued. It may be well, then, to see if structures considerably loftier than the average elevation to which Londoners have been accustomed can be raised which shall be fairly satisfactory to the view. Two instances may be cited of moderately successful buildings erected so far back as the sixties. The first is the Charing Cross Hotel; here the graduation of storeys and the lightness of the roof produce a not unpleasant effect, whilst the station yard is virtually a forecourt, and is agreeably broken by the Gothic "Eleanor Cross," patriotically revived by the South Eastern Railway Company; the iron grille, too, which bounds the front and one side of the yard, is simple and dignified. We are living, however, in the last year but one of the century, and it may be doubted if we shall ever see another terminus approach treated in this generous fashion; the pressure upon urban space and the desire for dividends are too strong. Another building of the same period is even better, architecturally—this is the Cannon Street Hotel, which is simpler, and of firmer design. Again, a fairly good approach provided in the shape of an open yard.

We may conclude, then, that high buildings can be treated with some amount of success, though opposed to the traditional very moderate elevation of English civil and domestic buildings. In each case, however, this satisfactory effect has been obtained with the aid of a rather effective open square; but where shall we obtain such squares in the future? The next building attempted on this scale was the Langham Hotel, which is exceedingly common-place, not to say ugly; placed on a very fine site commanding two great streets it represents an opportunity thrown away. A few years later arose the most extraordinary monstrosity that London has ever seen; this was Queen Anne's Mansions—twelve storeys of yellow London bricks, broken by monotonous little windows all exactly alike; architecture there is none, and to look up at it from below is distressing. Still, the system of high building did not spread, and a good many years elapsed before a general and noticeable increase in the height of street architecture set in.

One of the streets which may be said to have set the fashion is Northumberland Avenue. Its buildings are of varied rank and merit, the largest being the worst; it is ill-proportioned, being too narrow for its height, and consequently wanting in light, and the endless windows of its vast hotels leave an impression like a nightmare. The site of the old palace of the Percys, with its long, rather low front and Jacobean gateway, is occupied by a monotonous bastion-shaped thing which roughly intrudes itself upon Trafalgar Square; it is useful, however, as a warning to the public that no improvements can be satisfactory, however lavish the expense involved, unless authorities combine to work in harmony and allow their plans to be restrained by a sense of proportion.

J. C. P.

On Reflection.

The Amateur in Architecture.

IT will be remembered that the Earl of Wemyss, who takes a keen and laudable interest in architecture and in artistic matters generally, made a strong effort, at the time when the plans for the new War Office were being considered, to induce the Government to adopt an existing design by Inigo Jones. As is well known, Inigo Jones prepared designs for a palace at Whitehall, of which the Banquetting Hall (now used as the United Services Museum) alone was built. The completion of the design would have produced a line of buildings with a remarkably imposing façade, and it is not surprising that Lord Wemyss and many others were captivated by the idea. It had, however, the fatal defect that it failed to take into the reckoning the practical needs of a Government office, and ignored the fact that Inigo Jones's plan was the plan of a palace, not of public offices. To Lord Wemyss, and many other amateur architects, it might seem a perfectly practicable proposal to take a design for a beautiful building and adapt it to any possible requirements; to say to the architect: "Here is your building, fit your offices into it somehow." The Government, however, were better advised than to adopt this topsy-turvy method of proceeding; they preferred the more rational method of stating the accommodation required, and letting the architect design as beautiful a building as he might which should contain that accommodation, and should also utilise the whole of the very awkward site (another consideration Lord Wemyss' scheme would overlook). And so, having failed to impress the Government, Lord Wemyss issues a pamphlet giving the history of the controversy, in order that "the public and posterity may be able to form a sound judgment on this most important matter, and apportion blame accordingly." We cannot answer for posterity, but we have little doubt what the verdict would be of any present day jury of intelligent men who should take the trouble to read through the memorial to the Government on the subject, Lord Salisbury's answer thereto, and the debate in the House of Lords on August 4th, all of which are set forth in Lord Wemyss' pamphlet. Lord Wemyss seems to think that the fact that 140 peers signed his memorial gives that document a weight and impressiveness which should carry all before it. For ourselves we cannot see what claim these 140 distinguished individuals have to set up as censors of architecture, and we doubt not that many of them after considering the pros. and cons. of the matter will regret that Lord Wemyss has called posterity to witness that they made themselves the advocates of an ill-considered and impossible scheme. So far from convincing us of the desirability of the Inigo Jones plan, the pamphlet in which Lord Wemyss has marshalled the facts of the controversy points in an exactly opposite direction.

Sculpture by the Mile.

MR. RUSKIN'S objection to anything in the least mechanical has, as everyone knows, had ardent support and vehement opposition; but we are afraid the latest news from Berlin will cause more groans from the Sage of Coniston. Herr Selke, "a German inventor," has patented a method for producing sculptures by the aid of photography. There appears to be a rage just now for pushing forward the inventions (often fallacious) of the foreigner. A Russian or German engineer is reported to have devised some apparatus that is to turn the world upside down; and the public devours the news, and says "how wonderful." But very often you hear no more of this colossal invention. What would the public think if the same announcement were made of a mechanic at Little Pudlington? No, that would be too unexciting and common-place. It's the foreigner who claims interest, for he is the mysterious power that dabbles with worlds and carries the magic loadstone. This new invention of Herr Selke's is a case in point. Whilst in no way wishing to disparage its merits, we really cannot see why it is so boomed by pressmen, and we believe that to the true artist and craftsman it will certainly not appeal very directly. Here is a brief description of the invention. At a short distance from the model there is an arch of electric lamps having faint blue glasses for softening the light. Rising over the model's head is a second arch of jointed photographic plates, a few inches wide, which are movable forwards by a mechanical appliance connected with the camera. By means of certain shadows that are thrown, an unbroken series of so-called "photographic cuts" of the model are obtained. These are enlarged on cardboard, each is cut out with a fine saw, and the silhouettes are built up one on top of the other until the figure is complete. A viscid stucco-like material is put over it and the mould is ready for slight finishing touches with the modelling tool. The correspondent who forwards the information says that the photo-sculptures he saw were excellent, and very much like the originals. This then is the invention. The explanation of part of it is rather vague, but scientific reports forwarded from abroad often possess this characteristic. It is quite admissible to surmise that the cost of producing a sculpture by this method would be much less than by hand. Some builders would, perhaps, appreciate the new method, as it would enable them to add still more to their already greatly over-ornamented buildings. Sculpture is a fine art and a grand one, and it is thoroughly undesirable that it should in any way tend to become mechanical. We now possess a deal too many of those productions which Ruskin very aptly terms "furniture sculpture." One of our leading architects has described sculpture as the "very soul and voice of architecture," and we hope that should Herr Selke's invention ever become popular, it will confine itself to those limits where its presence may perhaps be defensible, and not intrude upon those where it is neither required nor desired.

Wanted—Pity and Funds.

THE Vicar of Castle Bytham, near Grantham, the Rev. H. Cotton-Smith, is in a terrible fix because of the state of his "neglected and dilapidated church." He knows what is wanted to be done, but this will cost £1,315, and he is faced with the oft-occurring difficulty of shortness of funds. The best way to explain the matter is to quote the vicar's own words:—"Our church is neither water-tight nor properly ventilated; the pews (falling to pieces) are impossible for kneeling; the walls are leprous; the chancel is a maze of benches; it is altogether uncomfortable, cold and cheerless, uninviting and inconvenient—not to mention the utterly neglected, cracked, unpointed walls, the absence of spouting, the decayed belfry, roof, and ceilings, and the general state of neglect *passim*." This list is, indeed, a pitiable one, but there appears to be no alternative but to effect a thorough restoration, or, what is perhaps better, to pull down the old church and build a new one.

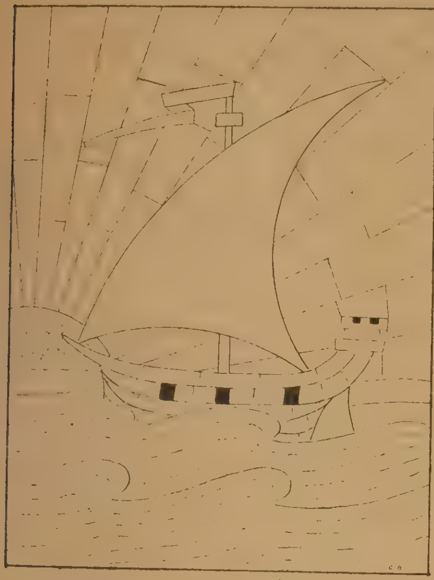


Fig. 1.

MOSAIC.

II.—MATERIALS AND METHODS.

By GEORGE BRIDGE.

(*Continued from page* 116, *No. CCXLII.*)

THE materials most generally used for mosaic work are glass and marble—there are others obtainable, but they all have certain drawbacks. There is a composition which is made into small cubes by compressing coloured marble dust in iron moulds under great pressure. They can easily be distinguished from real marble, as their appearance is somewhat like sealing-wax; and when a cube is split the interior faces have a very similar appearance to the fractured surface of sealing-wax. Not only are these cubes objectionable because of the treacly appearance they give to finished work, but they cannot possibly be as durable as marble, nor can they produce the same workmanlike effect, because no moulded tessera can ever give the same distinguished appearance to mosaic as one that has evidently been cut by a workman and not turned out by machinery.

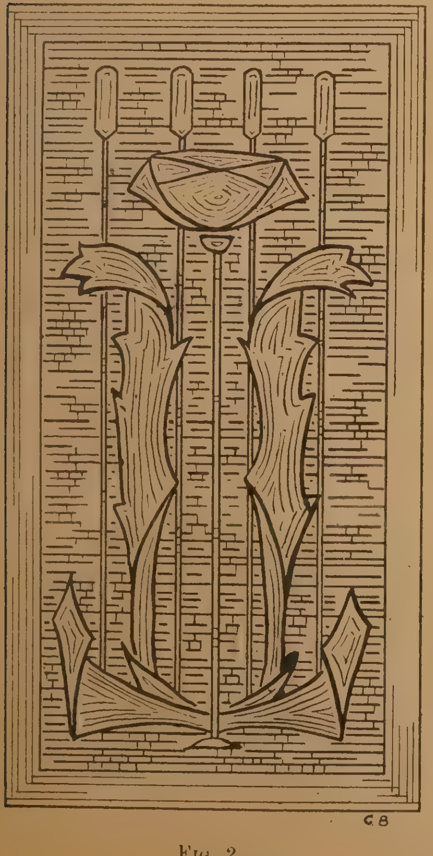


Fig. 2.

There are other machine-made forms used by some so-called mosaic workers, but as they are more of the nature of small tiles than of tesseræ they should really be classified as tiler's work. Pieces are cast or cut into hexagons, octagons, circles, squares, &c., being made of some ware that gives them the appearance of china, majolica, or ordinary pantiles. These have simply to be dropped into position to a geometrical design, and lack all the little irregularities so evident in mosaic and every craft requiring hand work. Another mechanical method of forming a so-called mosaic pavement is to float a layer of cement over a bed of concrete, and then to drop into the cement a number of chippings of various coloured marbles; when the whole is set the surface is rubbed down level with slabs of stone, but of course this is only a concrete pavement after all. These pavements are sometimes embellished with an ornament made by placing wooden templates in the cement, and, when the latter has set, removing the templates and filling in the spaces left with a marble concrete of another colour.

Both marble and glass are used for mosaic pavements, but marble is the material generally in favour. Although marble is not so lasting as glass it is less slippery in wet weather, and can be brought to a better surface; it is also cleaner in appearance, as the surface of the glass is slightly granular and very liable to scratch, and when once the dirt gets into the texture it is very difficult to eradicate, and, wet or dry, the pavement presents a permanently scored and spotty appearance. Of course, this only applies to glass for paving, and not that used for decorative work.

Glass is almost universally used for decorative work, as it is more durable than marble, and not so liable to be influenced by the chemical action generated by the atmosphere of some cities. By using glass a much wider field of colour is obtainable, and a greater variety of tints of each colour. Again, whereas marble when worn by time may present another tint or colour, glass, being made of one tint throughout, will remain unaltered. The glass employed for mosaic is made in ordinary glass-makers' pots or crucibles in kilns. The molten glass is ladled out upon slabs and pressed into a roundel of the required thickness—from ¼in. to ⅜in. The roundels should be kept to a uniform thickness, as, where tesseræ are used showing the cut edge, if the thickness of the roundels varies the lines of the tesseræ will be unequal. All glass for mosaic should be perfectly opaque. If the material is only semi-opaque, no matter how beautiful it may appear before being laid in the cement, once in position its transparency allows the dark cement to show through, and the most vivid yellows, blues, and greens become only very ordinary drabs.

The opaque glass is made of several textures; that is to say, when the roundel is broken the fractured edge will sometimes have a glassy and glittering appearance; sometimes a granular one, less glassy; sometimes a soapy appearance, with scarcely any glitter; and sometimes quite a dull one. Textures of all kinds are very useful in different parts of a mosaic, which should necessarily have the surface broken slightly by different textures in the materials. But when used singly in a work, a material that has a glittering edge reflects the light too much, and in consequence of the reflections only portions can be seen at a time, which makes the mosaic as difficult to decipher as a painting in a glazed frame. Flesh should be worked in a material that is as dull as it is possible to obtain it. Glass with a glittering edge is very useful in deep shadows of drapery—in places where, in a similar position in a picture, an artist would put a little varnish into his colour. But, of course, the proper use of the material requires experience, and the practical mosaic worker must use his judgment as to the positions in which he will place the various kinds of glass employed.

The roundels are cut up into pieces of almost equal length, this being a little more than the width. To cut the glass a machine is employed with top and bottom knives something like a small guillotine: the pieces can also be shaped by a pair of cutting pliers and American wheels (those used as substitutes for the ordinary glaziers' diamonds). The glass is not always used showing the cut edge. For very bold designs the material may be used in large flat pieces of irregular shapes to suit the flow of the lines of the design. When this method is adopted, glass is selected that has rich and varied effects upon the face of the roundel, and the required shapes are cut with an American wheel. A mosaic to be executed in this manner requires more than the ordinary rule-of-thumb knowledge of the imported Continental workman. It needs a keen sense and appreciation of colour, a thorough training as a draughtsman, and an acquaintance with the limits and rules of design. This will be understood when it is recognised that the shapes of the pieces of glass must be cut to help, and not to interfere, with the general design, and that the colour in the glass has to be much more intense than that shown in the design. If the individual colours were matched upon this, the finished mosaic would have a cold, bald, and washed-out appearance. This mode of working is very suitable for all work that is near the spectator, as if the joints are arranged properly the work is not liable to have the worried appearance that some artists produce when using the ordinary oblong tesseræ. This work is very effective in domestic decoration. Dadoes, wall fittings and friezes, fire backs and ingle nook panels, entrance halls, passages, corridors, bathrooms, and similar portions of public or private buildings, can be made beautiful in a permanent manner, the work being just as clean as, though infinitely more varied in colour effects than, that done with any other material.

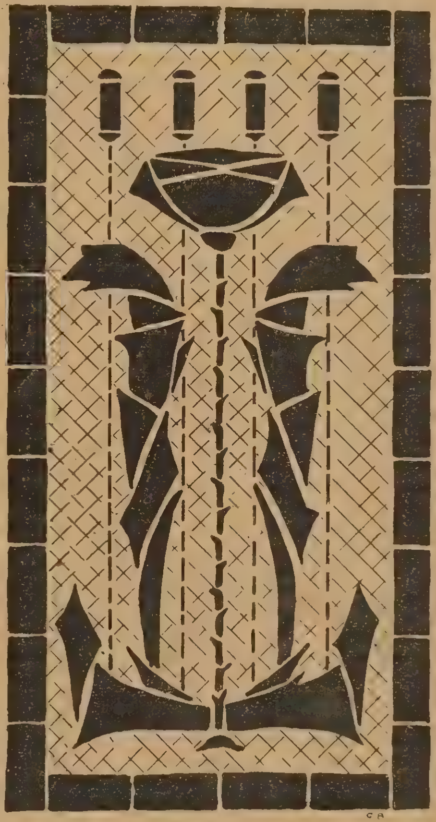


Fig. 3.

There is a bastard form of this mosaic used by some firms when cheapness is a consideration, but it is more the work of the tile painter than of the mosaic worker. Pieces of glass are cut to shapes suitable to the design, and the drapery, ornament, and flesh are painted upon them, and fired like painted tile-work, and then, like tile-work, the whole is cemented to the wall. This is not genuine mosaic, as in mosaic work there should not be the slightest question of its durability, and all effects should be obtained without the aid of painting, colouring, gilding, or any form of embellishment, and the worker should certainly have sufficient knowledge to obtain any effect by the use of tesseræ alone.

The worker may execute the mosaic either by sticking the tesseræ upon linen, paper, or strawboard, and then cementing it in place, or by spreading a putty-mastic over the surface and placing the tesseræ on it. The former method is used for mosaic pavements chiefly, as it gives a perfectly flat surface. There are some positions upon walls where it is best to have a perfectly smooth surface—in positions that are low enough to be touched by passers by; external walls also very often require a flat finish to prevent dirt and soot disfiguring the mosaic. The design must be traced and transferred so as to appear backwards upon the linen; it will then show its right face in the finished mosaic. The glass, whether on edge or laid in flat pieces, is stuck on the linen with gum, glue, or paste, and when the design is completed, if too large to be handled, it is cut up into convenient sizes for removal. The position to be occupied by mosaic—whether upon floor or wall—is cemented, and the sheets of mosaic are placed glass side towards the cement and well pressed in. The whole is then gone carefully over with a large flat piece of boxwood and a mallet, and hammered perfectly flat. The linen is then stripped from the face, and all the joints are carefully grouted up in cement and the places where joins occurred in the linen made good. Where a putty mastic is used a foot or two of the wall is spread with this substance about ¼in. thick, the design is pricked through a tracing into the mastic, and the glass, whether on edge or flat, is filled in to the design. If the work is to be finished flat, each superficial foot as it is completed is beaten with the wood and mallet.

When working large mosaics an inequality of surface is of very great service, as a broken surface gives a richness and texture to mosaic and removes the blemish so noticeable upon many large mosaics of having the appearance of monstrous oleographs. This appearance is evident in the restorations in St. Mark's, Venice; in the mosaics in St. Peter's, Rome; in the panels in the Albert Memorial, &c. The joints between the tesseræ play very important parts in large mosaics. The joint should be emphasised, and as much care should be taken to keep it equal as is shown in shaping each tessera. The joints should be at least half as wide as the tesseræ employed, and in some cases they can equal the width of the tesseræ—this is very requisite when gold is being used, as a good wide joint, while imparting a mosaic-like effect, gives to the whole work a softness, and also tends to grey and deepen colour. To masses of gold a wide joint gives more of an old gold sweetness, as distinct from the blatant, brassy finish of many gold backgrounds. This is a defect observable in the mosaics in the dome of St. Paul's Cathedral, where another blemish is very evident, and should be remembered by mosaic workers. These mosaics were executed upon linen, and afterwards stuck up in position, and the shapes of the slabs of linen employed are still observable. Where the joints between the pieces of linen occurred is permanently evident, the huge mosaics being scored vertically and horizontally like a great chessboard.

Referring to the illustrations, the ship panel (Fig. 1) shows mixed work by flat pieces with small tesseræ where necessary, while Figs. 2 and 3 show the same design executed in two ways, the former all of tesseræ and the latter of large flat pieces.

(To be continued.)

The Highest Church in Europe is the Sanctuary Chapel of the Madonna on Rocciamelone, Italy.

REGISTRATION OF ARCHITECTS.

AT THE A.A. DISCUSSION SECTION.

As our readers are aware The Builders' Journal and Architectural Record recently aroused great interest in the old controversy on the "Registration of Architects" by printing correspondence on the subject from many well-know members of the profession, and also by interviewing others. Partly, no doubt, as a result of this a discussion took place last Friday evening in the Architectural Association Discussion Section. The discussion, however, instead of breaking fresh ground, perhaps made the question more hazy and undecided than ever. The opinions that were elicited have all in the main already been expressed in our columns. Messrs. G. A. T. Middleton and A. R. Jemmett opened the discussion.

Mr. G. A. T. Middleton was in favour of the measure, which he contended involved the whole of the architects' position. At present anybody can pose before the public and practice as an architect. While admitting that the profession had many skilled and competent men, there were numerous unskilled men. Referring to the R.I.B.A. exams., he said a large proportion of those who did not go forward were allowed to practice as architects; this ought to be prevented. He wanted every architect to be properly qualified. This could only be done by Act of Parliament, by which all would be compelled to reach a certain standard or would not be allowed to earn their living as architects. According to the new Bill, all those practising as architects at the time of the passing of the measure would be enrolled as such in the first register, but no one would afterwards be allowed to enter the profession unless he were twenty-one years of age and were properly qualified.

The objection had been raised that by this system leading architects would be classed side by side in the first register with all the incompetent men now practising in the country. The effect would, in his opinion, be no worse than that produced by a Post Office directory and the list of architects in "Specification." Besides, it was not the old men but the young men who might expect to benefit by the Bill. The competition by which utterly incompetent men took the bread out of the mouths of young men was an unfair one, and ought not to be allowed. Some have objected that you cannot make an artist nor examine him in his art. He thought the R.I.B.A. could tell a very different tale. It was possible to tell whether a man could design or not, and to at least train an artist. The born artist was of little use if he remained untrained, as compared with what he might be if he were trained. On the whole, he thought the Bill was a good one, though some of the details of it might be challenged. It would effect a gradual leavening, it would do no immediate harm to anybody, and would be advantageous to the whole art world. It would not raise the status of architects, but the work produced would be generally improved.

Replying to Mr. Middleton's opening, Mr. A. R. Jemmett was of opinion that registration would unduly raise the professional side of architecture at the expense of the art side. Architects were artists, and should not be called professional men alone. There were numerous houses which were satisfactory as regards construction and utility; but they were not art. Such buildings could be erected equally well in an artistic manner. If artists were to be registered, why not register poets? He thought the guilds and societies exercised quite enough influence to keep the standard up. There was a great deal of difficulty in deciding what constituted an architect. If the Bill was passed, young men would strive to reach the stipulated standard, but would not soar above it, and the ideal of the architect would thus be damaged. Architecture was followed as a fine art of construction? Were those to be registered who were only constructors? If so, then the engineer would be the same as the architect. It was the architect and not the public who wanted to be protected. He was very much opposed to anything likely to make the profession the preserve of the sons of rich men. Generally speaking, this movement was due to dissatisfaction with the present state of the profession, and if carried out was likely to send out all artistic men. He thought the remedy lay in educating themselves and saying they did not know enough about architecture. The real question was whether it was a good thing for architecture as a fine art; if so, let them vote for it. The worse off an architect was in public repute the better architecture he often did.

Mr. Crawford Smith contended that architecture was a profession, and that construction was an important matter. He thought that the public would acknowledge the difference between the architect and the engineer. The fixing of twenty-one as the age at which one might be registered as an architect he considered too low: the standard should be raised to twenty-five years, as the majority of architects had not the necessary experience at twenty-one.

Mr. Maurice B. Adams was rather opposed to the movement, mainly on the grounds dealt with by Mr. Jemmett. It was not possible to examine a man in an artistic sense. He was inclined to side with those who thought how utterly inadequate registration would be. Registration would not altogether secure the public in the matter of construction. He thought that in the end the good architect would be able to compete successfully with the humbug, and that the public would be able to judge who was worthy of their confidence and commission.

If architecture was only a fine art, Mr. Ellis Marsland said he would agree with all that Mr. Jemmett had said. But it was not. It was also a science, and had a material side. There were only three professions—the Church, Law, and Medicine. Architecture was not one. Registration would stop incompetent men practising.

Mr. R. W. Carden was of opinion that the practical side of the question was a great deal more important than the artistic side, and he could not see why registering a man as being competent could injure him as an artist.

Mr. A. S. Taylor said that registration would be a big mistake. You might have a disqualifying examination, but it was impossible to examine a person as an artistic builder. Two great difficulties in registration would be, who would hold the examinations and who would set up the standard?

Mr. H. Munro Cantley thought that registration would not curb the artistic ability of the architect in any way.

When the public wanted an architect, said Mr. James Pearson, they only wanted a qualified man. If a man was registered it would be a guarantee to the public that he was competent.

Mr. Matthew Garbutt favoured the Bill, but said that if articles were insisted on it would shut out many clever but poor men.

Mr. C. H. Brodie said that you might prevent a man calling himself an architect, but you could not prevent him putting up buildings. On this ground he was opposed to registration.

Mr. George H. Smith said that if the Bill became law a local authority would not be allowed to employ an architect for public buildings unless he were qualified.

The chairman of the meeting thought that registration would do no harm to architects. It would not do any harm to the public. Broadly speaking, he thought that a Registration Bill would be a dead letter, for how were you going to prevent a man putting up a building without the supervision of a qualified architect?

Mr. Seth Smith's experience was that great movements had sprung from small beginnings, and had been at first very unpopular. This had been the case with the medical and dental professions. No Bill could prevent a man building, but this Bill would prevent him using the name of architect. As far as he knew, the Bill was not a matter of articles. He thought the status of the profession was an enormous thing. Great professions tended to make great men. The Registration Bill had greatly benefited the dental and medical professions. Unless a profession were really comprehensive the public would not take interest in it. The Bill would exclude incompetent men, a merit which would be especially appreciated by the provincial architect. He felt that it would raise the profession in art as well as in construction. It would be detrimental if the examination were only a practical one. Any capable artist could pass the examination that would be required. Votes of thanks were proposed and seconded, and the meeting then closed.

THE ARTS AND CRAFTS EXHIBITION.

THIS year's exhibition of the Arts and Crafts Society derives unusual interest from the fact that one gallery is entirely devoted to a collection of hitherto unexhibited works of the late William Morris. This collection includes tapestries and needlework from his designs, original working drawings for textiles and wall-papers, drawings made for the Kelmscott Press, and a most curious oil painting said to be the only one he ever executed. It is not necessary to attempt any detailed examination of this most interesting collection. The exhibition, to every admirer of Morris's work, would be well worth a visit if only to see this one gallery. Of the bulk of the contemporary work which makes up the rest of the display it is difficult to speak in general terms. It is varied and unequal. There is work which shows art, and work which shows craft; work which shows both, and work which shows neither. Perhaps the general impression that one brings away is that of a better exhibition than in previous years, less of the merely eccentric, more of the sober and restrained, less affectation, more sincerity.

It is a curious thing that the more successful works are generally those which more nearly approach to pure works of art, in which the craftsmanship is an entirely secondary and subordinate thing. We have in mind such works as the charming panels in coloured plaster, Nos. 104 and 105, by Anning Bell, the small panel in bronze, No. 112, by George Frampton, and the two small silvered panels by Goscombe John. The panel representative of music and dancing pleased us as much as anything in the room. In composition, drawing, colour and sentiment, it is delightful. If one must find some fault it would be that the left hand figure seems a trifle short, and that its arrangement, and its outline against the background, is hardly so fine as the rest of the panel. Another good work, of somewhat the same class, is a bronze panel in relief, for a fireplace, by Charles Beacon, No. 72, representing Orpheus and the beasts.

If we compare the different classes of exhibits we find a higher standard in the metal-work, jewellery, and blown glass than in the furniture. Nelson and Edith Dawson have a case of the most delightful work, in which the art and the craft seem fairly balanced; and in case G, West Gallery, are jewellery and necklaces by Miss May Morris and Miss Jane Morris, to which the same remarks apply. In the North Gallery, No. 256. are a forged iron and brass firegrate and a fender, by Nelson Dawson, which should be seen. They are vigorous and strong, and handled with knowledge and power. As a bit of real artistic craftsmanship they appeal to us as the best things of their kind. Close to this work stands a dresser, No. 142, by Sidney H. Barnsley, which one regards with mingled feelings. It is of plain oak, left its natural colour, and intentionally simple in design and workmanship; but somehow it does not altogether satisfy. When one comes to think about it, it becomes evident that much of the design is illogical. On plan the centre part projects with a segmental curve like a bow window, with a very heavy central support, into which the horizontal shelves, &c., are framed. This is surely not a convenient or characteristic form for a dresser, as it practically takes up as much room as if the whole piece of furniture projected as far as the centre part, and it makes the cupboards in the curved part too deep to be convenient for the bottles, jars, and other household effects for which such cupboards are generally used. This curved portion also has four doors on each side of the centre post, but only two cupboards where four are suggested. The upper part, corbelled out and arranged with shelves and hooks for hanging jugs, is very slight and insecure in construction. The top shelf has, at each end, a small cupboard with doors, which have very heavy raised panels. These raised panels are surely contrary to common sense, they are more characteristic of stonework, in cases where an appearance of weight is desired. Wood panels were invented to reduce the weight of a door, while keeping it sufficiently strong. They should do so in appearance as well as in reality. To treat them otherwise is to destroy their motive and *raison d'être*, and to use the wood in a manner that is not characteristic of the material. This design strikes us as being sincere, and as having a certain quaint air of rusticity about it which is very pleasing; that is why we regret that it does not show more judgment.

There are several articles of furniture, such as writing tables and cabinets, which appear to us to be more the outcome of affectation than of the needs of the case and the qualities of the material. Some of them have a more or less pleasing general effect, so long as we don't ask what they are and why they are made like that. Several have feet made of spherical wooden balls, which is about as bad a shape for the purpose as one could invent. They do not get a good firm grip on the floor, and the junction between the ball and the woodwork above must be weak, unless there is hidden metal—which would not be good construction. Why, again, is it necessary to bind a writing cabinet with broad bands of metal which incidentally form hinges? In mediæval times, when boxes had to stand more knocking about, and when property was less secure, but when, at the same time, there were no scientific burglars, it was all very well. Nowadays a burglar, who was a really skilled craftsman, would make short work of any metal-bound cabinet. These particular cabinets, however, do not seem to be designed with any special regard to safety; it is only that a piece of metal performing one function takes a form peculiar to another for no apparent reason, unless it is the repetition of an old form which in its day had its reason. There may be a better reason, but in artistic construction it should be at once apparent. The worst of such designs as No. 167, and others of the same type, is that they do give the enemy an occasion to blaspheme. "Take a packing case, stain it green, bind it round with hoop iron, put it on four legs, and tell us to come and admire it." This is the sort of remark one hears, and it is a pity.

A relief to this class of work is afforded by a simple and pleasing oak dresser, designed by Charles Spooner, which is perhaps one of the most satisfactory bits of furniture to be seen. Speaking, generally, however, the chairs seem better than the rest of the furniture. No. 203, a walnut chair by L. A. Turner, is pleasing in shape, and has forms which are suggested by the purpose which it serves. No. 253 is not so good, it is simpler but it looks stiff, and is nothing like so comfortable. There are a good many small chairs hidden away in corners in the central hall and north gallery which are more worthy of attention than many larger things more prominently placed.

In this central hall, also, are various chimney pieces in wood and iron, such as Nos. 409, 414, and 455. With the best wish in the world it is impossible to admire such designs; as specimens of workmanship they are good, but where does the art come in? The fact seems to be that the designers of most of the articles of utility, that need construction, forget that construction in itself is a fine art—perhaps the finest of all. A chair is made to be sat in and not to be looked at; it has to serve a certain purpose and is made of a certain material, its form is the outcome of these two circumstances. The art, or taste, or genius, is shown in creating a form which exactly expresses this purpose. The more nearly it approaches this the more original is the chair. If the result does not please us, we are in fault, not the chair, and the same thing is true of a cabinet or a fireplace. It is a question worth asking whether the average of workmanship shown in this furniture is superior, or even equal, to that done by first-class cabinet makers who have no pretensions to be artists. This is a point which we think should be always borne in mind. There seems a danger of the artist turning amateur craftsman, and if a piece of furniture is illogical in design and indifferent in workmanship, it is not to be saved by being stained green, or by being inlaid with a representation of a tree torn up by the roots.

It is impossible to point out in detail all the interesting and charming small objects which are to be seen; everyone should go to the exhibition and see them for himself. There are some blown glass by Harry Powell, altar crosses by H. Wilson and others, copper bowls and caskets, pewter plates, a lead sun-dial and rainwater head, pots and pans, fire-screens and coal scuttles, &c., &c. Of special interest to architects is a model of a small house to ¼in, scale by L. F. Crane. This is a nice design in rough cast and green slates, and by the way in which the ladies walk round it, and try to peep through the windows and down the chimney pots, and speculate as to what is inside, it is evident that this is a far better way of calling attention to one's work, in a legitimate manner, than is a drawing on the walls of the Academy.

The movement, which is represented to some extent by this exhibition, is one which is probably destined to have great influence over the art of the immediate future, and is, moreover, one with which we have great sympathy. But to have any permanent value it must be pursued on sane, healthy lines. Its success will depend on the number of sincere, hard-working men who think more of their work than of themselves, not on those who mistake fashion for principle, exalt novelty above originality, and think more of themselves than of their work. "Torn frocks," said Sidney Smith to the bad little girl, "are not in themselves a proof of genius." Neither are outraged conventions. Insanity may possibly be akin to genius—but why encourage and parade our disreputable relations?

A. R. J.

Mr. Towneley Green, a popular member of the Royal Institute of Painters in Water Colours, died on October 9th.

Royal Society of British Artists.—At a general assembly of this society on October 11th, the following were elected members: E. C. Officer, E. Leslie Badham, J. T. Dunning, Arthur Legge, and Harold Burke.

The Largest Scheme for Municipal Workmen's Dwellings yet inaugurated has just been adopted by the West Ham Town Council. On 100 acres of land, 3,000 houses are to be erected, at a cost of £1,000,000.

The Edinburgh Architectural Society held their annual business meeting in Dowell's Rooms last Wednesday evening, when the following officers were elected for the coming session:—President, Mr. Alfred Greig; vice-president, Mr. P. E. Nobbs; librarian, Mr. J. F. Matthews; joint secretaries, Messrs. A. Muir and C. B. Cownie; and treasurer, Mr. A. H. Lamont.

A Gladstone Memorial Tablet of marble and alabaster has been placed in Hawarden Church between the pulpit and Armenian window. At the head of the tablets are the words, "That rock was Christ." On one side are four verses of the hymn, "Rock of Ages," and on the opposite side the same verses in Latin, with an inscription stating that the hymn was translated by Mr Gladstone, and that the tablet has been placed by his grandchildren. The tablet was designed by Messrs. Douglas and Minshull, architects, of Chester, and executed by Mr. F. G. Sewell, Grosvenor Street, Chester.

MODEL ANSWERS TO EXAMINATION QUESTIONS.

Answers to Questions set in the Examination held by the Society of Architects in April, 1899.

BY G. A. T. MIDDLETON AND R. W. CARDEN, ASSOCIATES R.I.B.A.

(Continued from page 135, No. CCXLIII.)

V.—CONSTRUCTION. (Part II.)

6. *A framed and glazed mahogany partition, 8ft. high, is required to divide a large office, the width being 24ft. A door is required at 6ft. from one end. Draw elevation to scale of $\frac{1}{2}$in. to 1ft., and horizontal section through door, half in lower and half in upper part, to a scale of $1\frac{1}{2}$in. to 1ft.* (See illustrations.)

7. *Give elevation and section of a French casement and fanlight for an opening 4ft. 6in. by 8ft. 6in. Scale $\frac{3}{4}$in. to 1ft.* (See illustrations.)

8. *Four rolled joists, 10 × $4\frac{1}{2}$ × 30lbs., meet on the head of a X stanchion, 9 × 9 × $1\frac{1}{4}$, which carries another stanchion above. Give a perspective view, or such other sketches as will accurately show the construction. Scale, say, one twelfth.*

A plate rests upon the head of the lower stanchion, and on this rests the rectangular cast box, to which the four joists are secured by angle irons. These joists are also secured to the plate, and the plate is bolted down on to the stanchion.

9. *Draw a diagram of the bending moments on a girder, 30ft. span, supported at the ends with a uniformly distributed load (sic.) of 15 tons, including weight of girder, and a concentrated load of 5 tons at 10ft. from one end. Scale $\frac{1}{8}$in. to 1ft., and 10ft. tons to 1in.*

(This question and the next were voluntary.)

Bending moment for distributed load :—

$$B.M. = \frac{w \times l}{8}$$
$$= \frac{15 \times 30}{8}$$
$$= 56\tfrac{1}{4}\text{ft. tons.}$$

Bending moment for fixed load :—

$$B.M. = 10\text{ft.} \times \tfrac{2}{3} \text{ of } 5 \text{ tons.}$$
$$= 10 \times 3\tfrac{1}{3}$$
$$= 33\tfrac{1}{3}\text{ft. tons.}$$

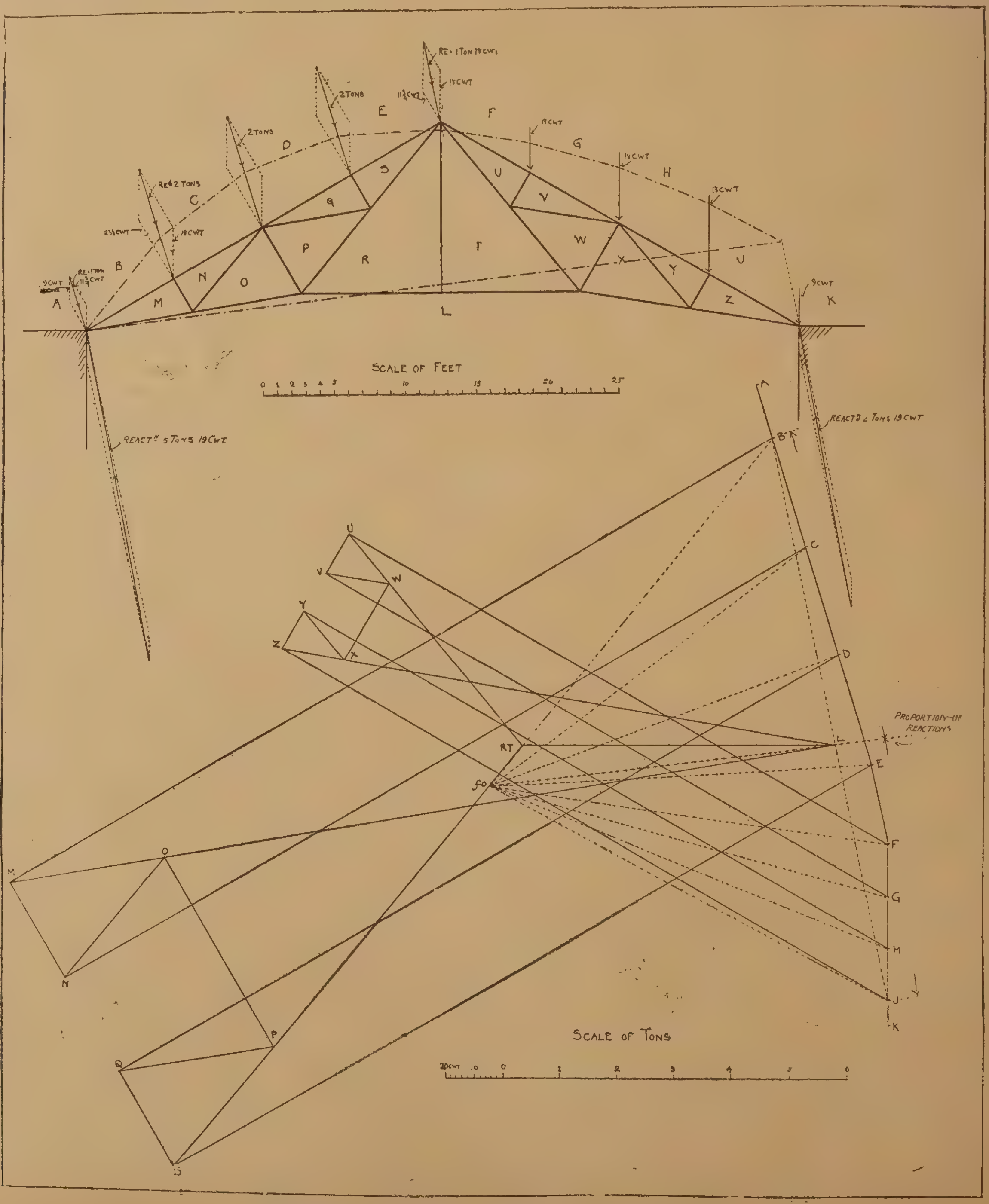
In the illustration, the firm straight-lined figure shows the B.M. for the fixed load. The fine-lined parabolic curve shows the B.M. for the distributed load, and the firm curved outline shows the ultimate B.M.

10. *Draw the frame diagram of an iron roof-truss suitable for a span of 50ft. and the corresponding stress diagram, assuming a vertical load of 28lbs. per ft. super., and the wind blowing on one side with a force of 30lbs. per ft. super. normal to the roof plane. Trusses 12ft. apart, scale 8ft. to 1in., and $\frac{1}{2}$in. to 1 ton.*

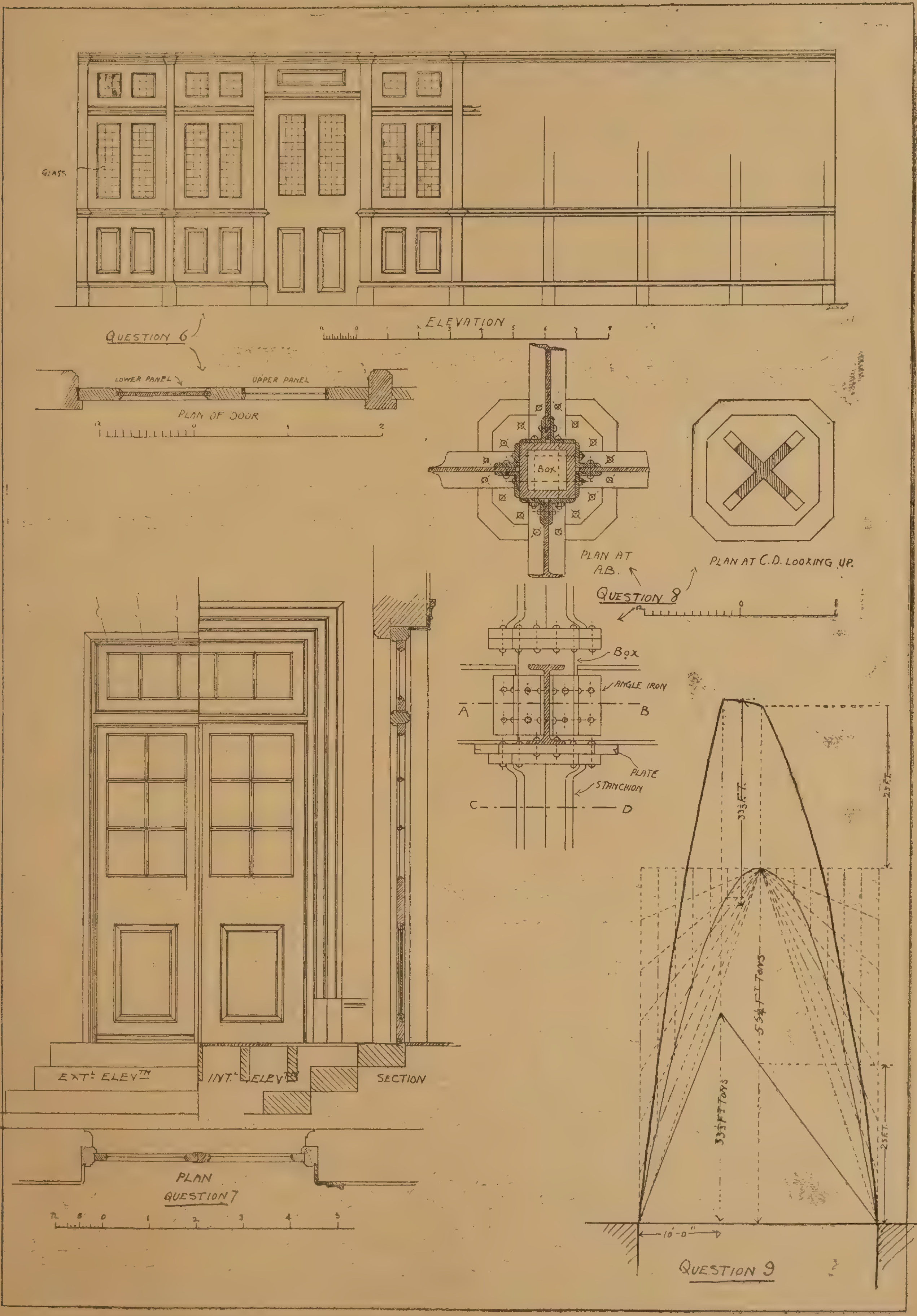
Dead load :—
50ft. × 12ft. × 28lbs.
= 16,800lbs.
= 2,100lbs. per "bearing" point (or about 18cwt.).

Wind pressure :—
29ft. × 12ft. × 30lbs.
= 10,440lbs.
= 2,610lbs. per point.

In the illustration, the dotted lines show the polar diagram, and the firm lines the stress diagrams.



ILLUSTRATING ANSWER TO EXAMINATION QUESTION 10.



ILLUSTRATING ANSWERS TO EXAMINATION QUESTIONS 6 TO 9.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

HOT-WATER APPARATUS.

To the Editor of THE BUILDERS' JOURNAL.

LONG EATON.

SIR,—The water of our town is very hard, and when used in hot-water apparatus is liable to seriously fur up the pipes when they are of iron. Would the use of copper pipes and cylinder obviate this in any way, and would there be any likelihood of galvanic action being set up if copper was used for the primary circulation pipes and cylinder, and galvanised iron pipes for the secondary circulation, &c.?—Yours sincerely, K. G.

Copper should not be used on account of the danger of verdigris. The Tubular Bath Boiler Co., Ltd., 184, Gray's Inn Road, E.C., make an apparatus which would probably suit your requirements.

LIGHT FROM SHOP WINDOW.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, N.W.

SIR,—I shall be extremely obliged if you will give the solution to the following problem: The window opening of a shop is 10ft. wide; which will admit the greater quantity of light, a square window 10ft. high, or a semicircular one, 6ft. to springing?—Yours truly,

GEOMETRICUS.

The square window, 10ft. by 10ft. would admit slightly more light. Square window: 10ft. × 10ft. = 100 square feet of opening. Semi-circular headed window: 10ft. × 6ft. = 60 square feet. Area of head: $\frac{\Lambda\gamma^2}{2}=\frac{22}{7}\times 5\times 5 \times \frac{1}{2}=39\frac{2}{7}$ square feet = total area, $99\frac{2}{7}$ square feet, or a difference of 102·85 square inches.

R. W. C.

WHAT IS A PARTY WALL?

To the Editor of THE BUILDERS' JOURNAL.

WESTON-SUPER-MARE.

DEAR SIR,—Kindly say if the wall marked A on the enclosed sketch (not reproduced) would be considered a party wall. It is about 5ft. high and encloses the garden of the adjoining owner. When building the stable (about twenty years ago) this wall was built up to the required height. The adjoining owner claims the wall as his, and says it is not a party wall. Please also say whether I can compel him to cut down the two trees which overhang my property, the falling leaves, &c., from which are a nuisance.—Yours, &c., A. C.

Whether the wall in question is a party wall or not depends on the ownership of the ground on which it is built. If the ground belongs entirely to either of the two adjoining owners it is not a party wall. If it belongs to them in common, or half in width belongs to one and half to the other, it is a party wall. In reply to the second question, the owner cannot be compelled to cut down the trees, but he can be compelled to cut the branches which overhang querist's ground, or querist can lop them off himself. H. P. B.

BOOKS ON LAND SURVEYING AND LEVELLING.

To the Editor of THE BUILDERS' JOURNAL.

LOUGHTON, ESSEX.

SIR,—Could you oblige me with the names of what you consider are the best books on land surveying and levelling.—Yours, &c.,

S. H. J. M.

The following are very suitable books:—"Practical Surveying," by George W. Usill, A.M.I.C.E., with four plates and upwards of 330 illustrations; crown 8vo, cloth, 6s. net. "The Theory and Practice of Surveying," by J. B. Johnson, illustrated by upwards of 150 engravings; 8vo, 17s. net. "Surveying," a practical treatise on the science of land and engineering surveying, levelling, estimating quantities, &c., with a general description of the several instruments required for surveying, levelling, plotting, &c., by H. S. Merrett, revised by G. W. Usill, A.M.I.C.E., forty-one plates, with illustrations and tables; royal 8vo, cloth, 10s. 6d. net. "Levelling and its General Application, by Thomas Holloway; 8vo, cloth, 4s. 2d. net. These can be obtained from Mr. B. T. Batsford, of 94, High Holborn, London, W.C.

WATER UNDERNEATH HOUSE.

To the Editor of THE BUILDERS' JOURNAL.

HARLESDEN.

SIR,—Could you tell me the best way to get rid of water under a house. I think it must run down the footings of the party wall on the left-hand side, as whenever it rains water is found at the front door. I might mention that walls are already in for cellar, although this is not excavated. The drains have been tested and found sound.—Yours truly,

B. J. S.

According to the sketch accompanying the query (not reproduced), it would seem most probable that the drains were at the root of the trouble seeing that they run through or alongside the spot where the water collects; and, although the drains have been tested and found sound, one feels strongly inclined to advise that a further and more searching test be applied to them, particularly so for the reason that, according to available particulars, we can see no other possible cause for the water accumulating at the indicated spot. There seems to be no reason why the footings of the party wall should serve to draw the water, unless a rain-water pipe is allowed to discharge in close proximity thereto, or unless the ground or pavement falls towards instead of from the house. Before any remedy can be applied or suggested it will be necessary to have positive proof as to where the water comes from; and perhaps the best course to pursue would be to remove the flooring near the front door in readiness for a strict observation to be made during a sharp fall of rain.

H. E.

PREVENTING DISCOLOURATION OF PAINT.

To the Editor of THE BUILDERS' JOURNAL.

FALKIRK.

DEAR SIR,—Will you kindly let me know whether there is any oil or other material that, if applied to new cement work, will prevent the acid in the cement eating out the colour of the paint on the front of a house. I generally find with outside walls that are cemented and painted that where the cement has been newly rendered, or where patches occur, the colour always fades in a very short time. Any information as to the means of preventing this discoloration will much oblige.—Yours faithfully, A. G.

It is in all probability a free alkali present in newly rendered cement work, which is the cause of the corrosive action to which paint applied thereto is always more or less subject, and not an acid as is generally supposed; and as an alkali finds its antithesis in an acid, it is possible that the application of a weak solution of acetic acid (or ordinary vinegar), such as is frequently employed as a corrective, before painting interior plastering, may minimise the trouble; but care need be exercised that only sufficient acid is used to neutralise the alkali present, as an excess of one element is as deleterious to paint as the other. When it can be so arranged it is advantageous to leave new cement work unpainted for at least twelve months, after which interval no trouble is usually experienced. But as the front of a house is mentioned, and as it is not usual to paint a newly rendered front, it occurs to me that the question may have reference to new cement patches in old work, and although it may in the present instance be too late to effect any alteration in the work it may be instructive to note that patching should be executed with Roman cement, which allows paint to be applied to its surface without any preparations, and upon which it has no corrosive action. Presuming the work cannot be now undone, one of the following plans might be tried; but, although each is said to be effective, I cannot vouch for their efficacy: (1) Give the work a coat of Duresco as soon as the plastering is finished. (2) Apply a coat of petrifying liquid (Fluate or Lopissa solution are suggested) three or four days after repairing the work, and giving a second coat when the first is quite dry. (3) A simple coat of ordinary distemper. The only oil likely to be of service is boiled linseed oil, but we are much inclined to doubt its complete efficacy for the purpose. H. E.

TAKING OUT QUANTITIES FOR FACTORY CHIMNEY.

To the Editor of THE BUILDERS' JOURNAL.

MANCHESTER.

SIR,—Will you kindly state the method of taking out the quantities for brickwork in a factory chimney, octagonal on plan and about 150ft. high.—Yours truly, J. V. S.

Commence with excavation, measuring the length and breadth of the concrete and the depth to underside from ground level. If more than 6ft., keep each 6ft. separate, as —yds. cub. in excavation under 6ft. deep, —yds. cub. ditto under 12ft. deep. State proportion removed — runs, spread and levelled, or carted away, as case may be, and remainder as excavate, and throw out, re-dig and ram. Let the preamble contain a clause for pumping or bailing to keep the foundations free from water. If there are any soft places in the bottom they must be filled with dry brick rubbish and well rammed before the concrete goes in. Measure the whole surface of the sides of excavation for timbering, calling it —ft. sup., strutting and planking to sides of perpendicular excavation — ft. deep. Measure the concrete length, breadth, thickness, and state — yds. cub. Portland cement concrete as described; — yds. sup. spread and level Portland cement concrete to receive footings. In measuring the brick footings they must be averaged, but not in the same way as averaging the footings of a brick wall. Owing to the set off on all four sides the method of averaging, if square, will be as follows:—(*a*) [(breadth top course + breadth bottom course) ÷ 2]^2 × depth of footings. (*b*) (breadth top course squared + breadth bottom course squared) ÷ 2 × by depth footings. Then (*a*) + (b) ÷ 2 = ft. cub. Thus top course 12ft., bottom course 18ft., depth 4ft. 3in. $(a) = [(12 + 18) \div 2]^2 \times 4\frac{1}{4} = 956\frac{1}{4}$. $(b) = (12^2 + 18^2) \div 2 \times 4\frac{1}{4} = 994\frac{1}{2}$. $[(a) + (b)] \div 2 = 975\frac{3}{8}$ = 975ft. $4\frac{1}{2}$in. cub. The brickwork of the stack will be measured in portions as the shape or thickness changes. Measure first the size of a square to contain the part and multiply by the length. Then measure for deduction the wants at the angles and the flue. Bring the whole of the stock brickwork finally into one item reduced to yds. cub. and describe it as cube brickwork in mortar, to chimney stack measured net — ft. high. If over 60ft. high, the material above that height is sometimes billed separately for each 20ft. to allow of the price being modified to cover the extra cost of hoisting and scaffolding. See that the drawing is in accordance with the London County Council rules or local bye-laws, as regards thickness, batter, footings, projection of cap, &c. Measure for rough cutting to interior, and fair cutting to face for all skewbacks, measure gauged arches, relieving arches, string courses, dentil courses &c., as they occur. Facework and pointing, also up each angle of octagon for fair cut squint quoin. Leaning's Quantity Surveying (Spon, 15s.) should be followed for the mode of measuring details of brick and stonework, it would occupy too much space to recapitulate it all here. Provide centering for the arches, and for the flues also, unless they are covered with flat fire tiles. HENRY ADAMS.

In reply to NEW SUBSCRIBER, the first number of the present volume was No. 235., dated August 9th.

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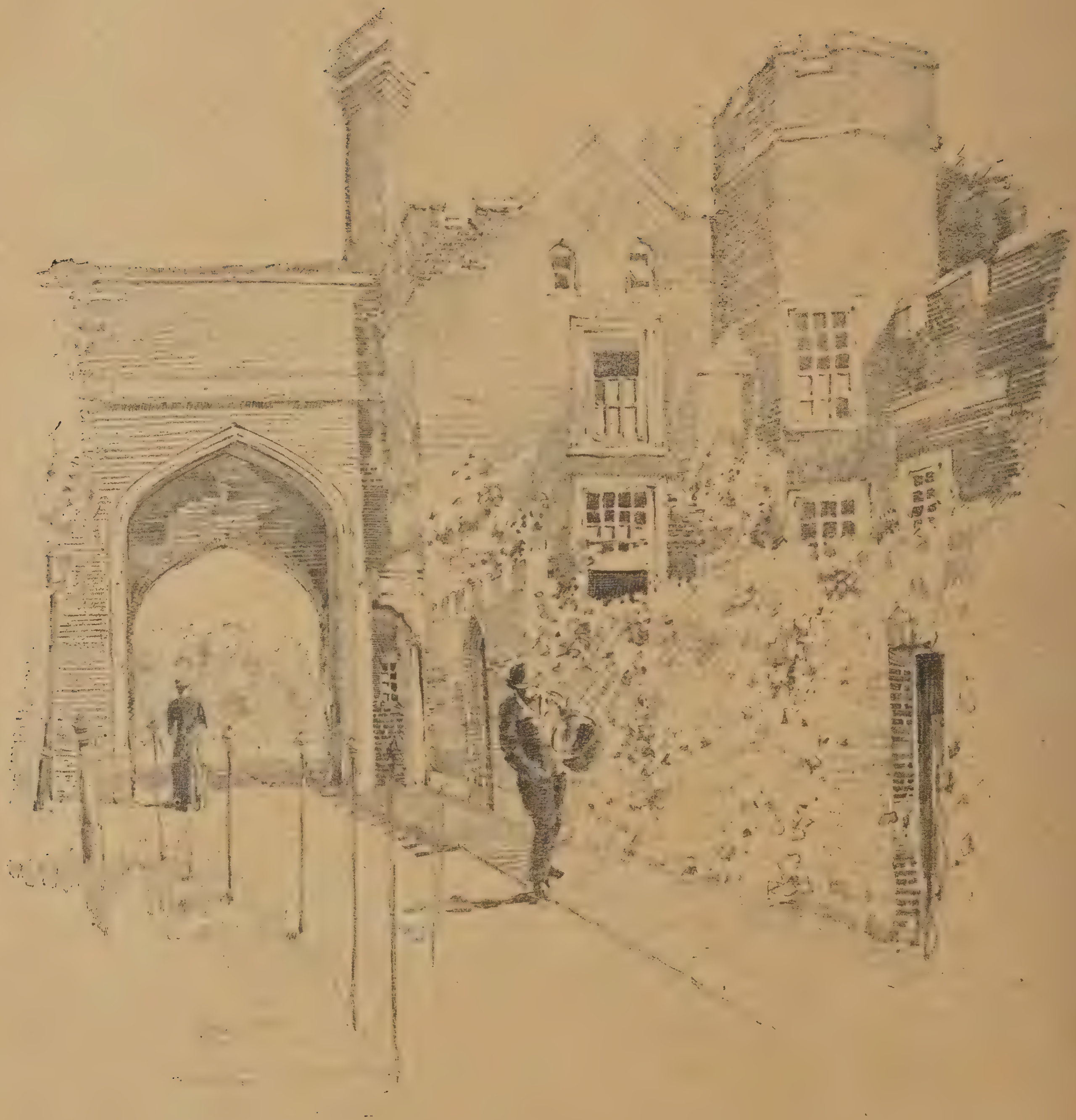
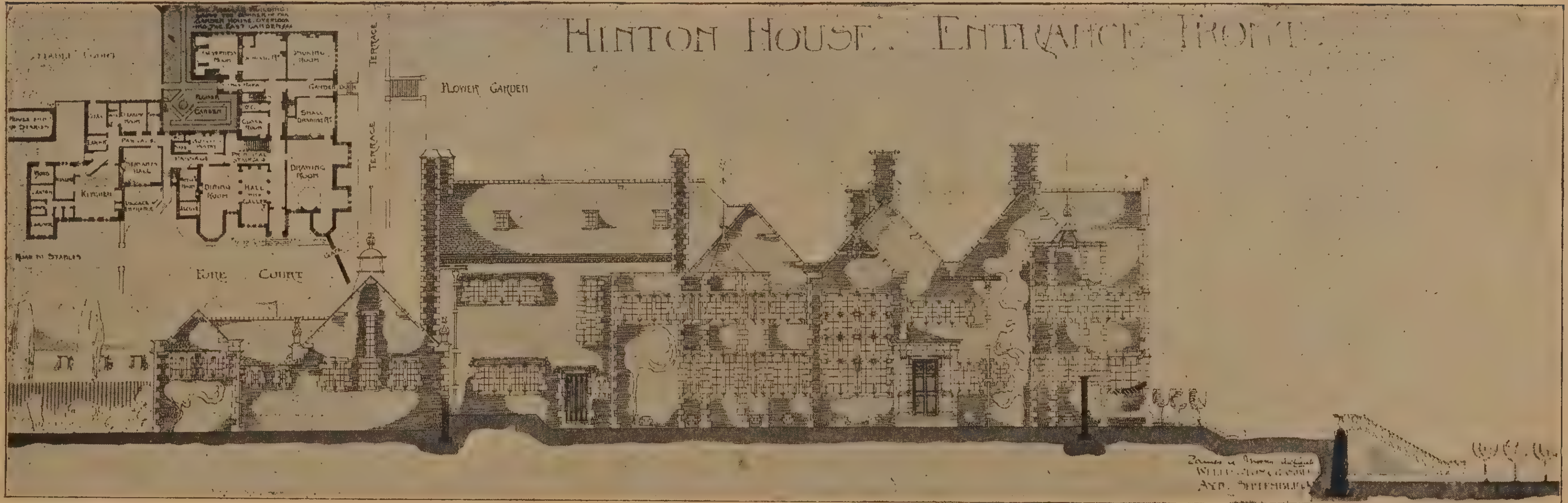
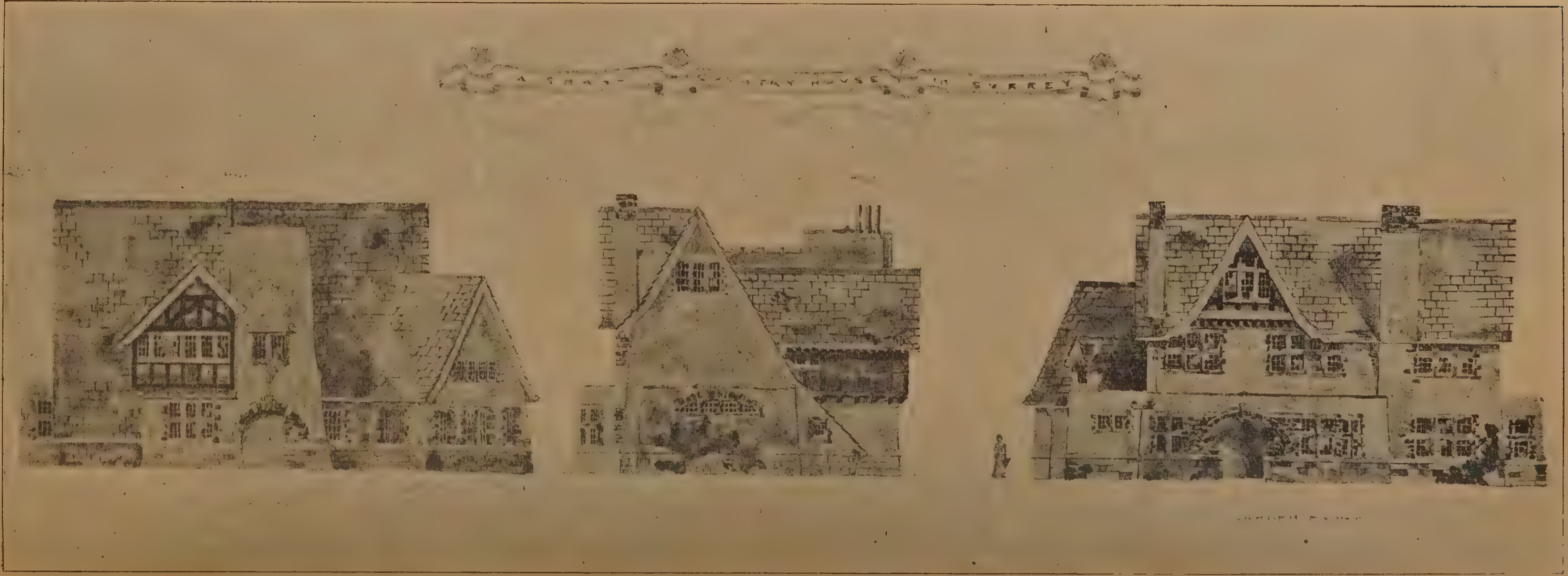


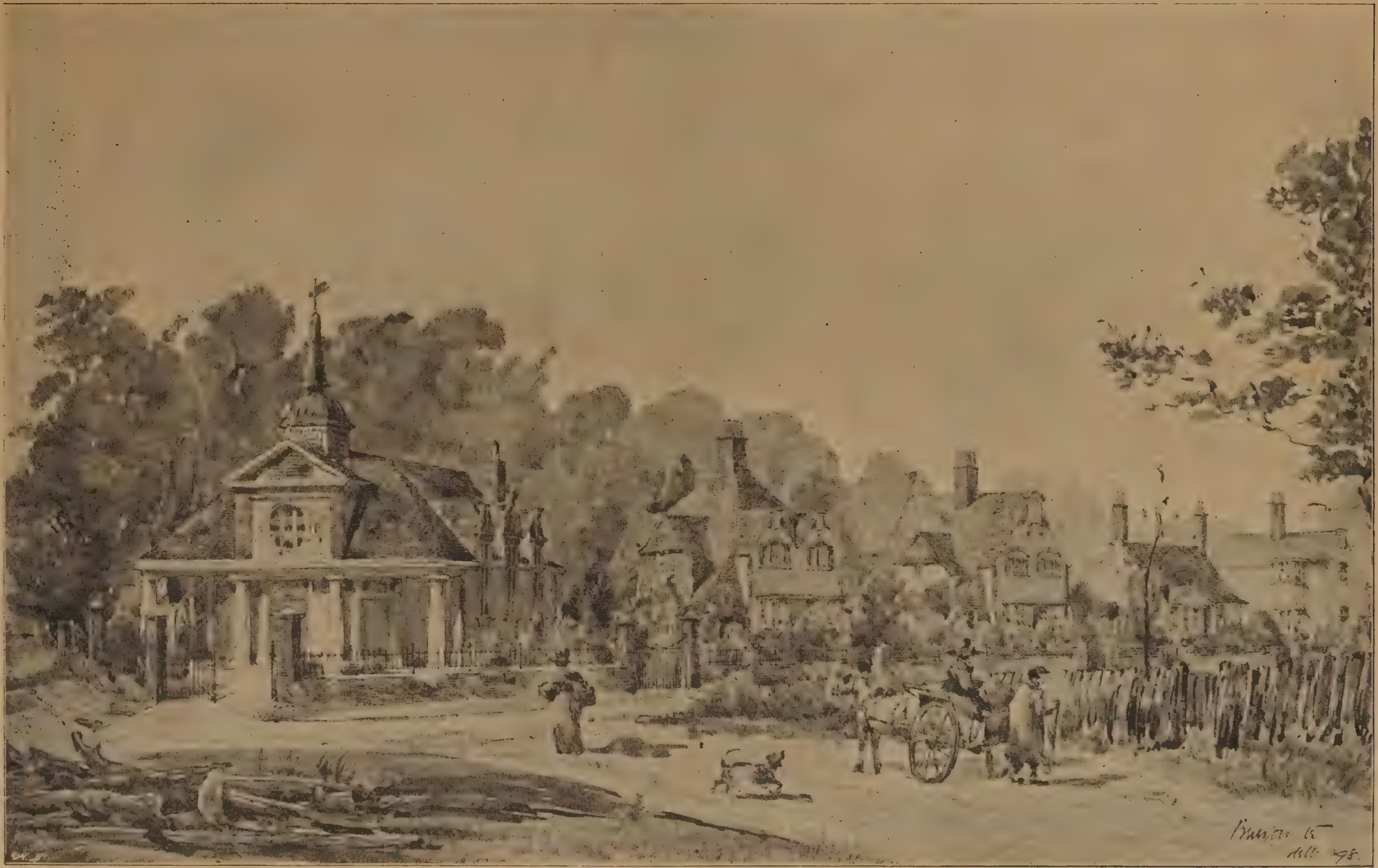
A SKETCH AT RICHMOND. By H. F. Waring.



HINTON HOUSE, NORTHAMPTONSHIRE. JAMES A. MORRIS, ARCHITECT.



J. W. RHODES, ARCHITECT.



DESIGN FOR ALMSHOUSES AND VILLAGE HALL, SALTWOOD. BERESFORD PITE, ARCHITECT.

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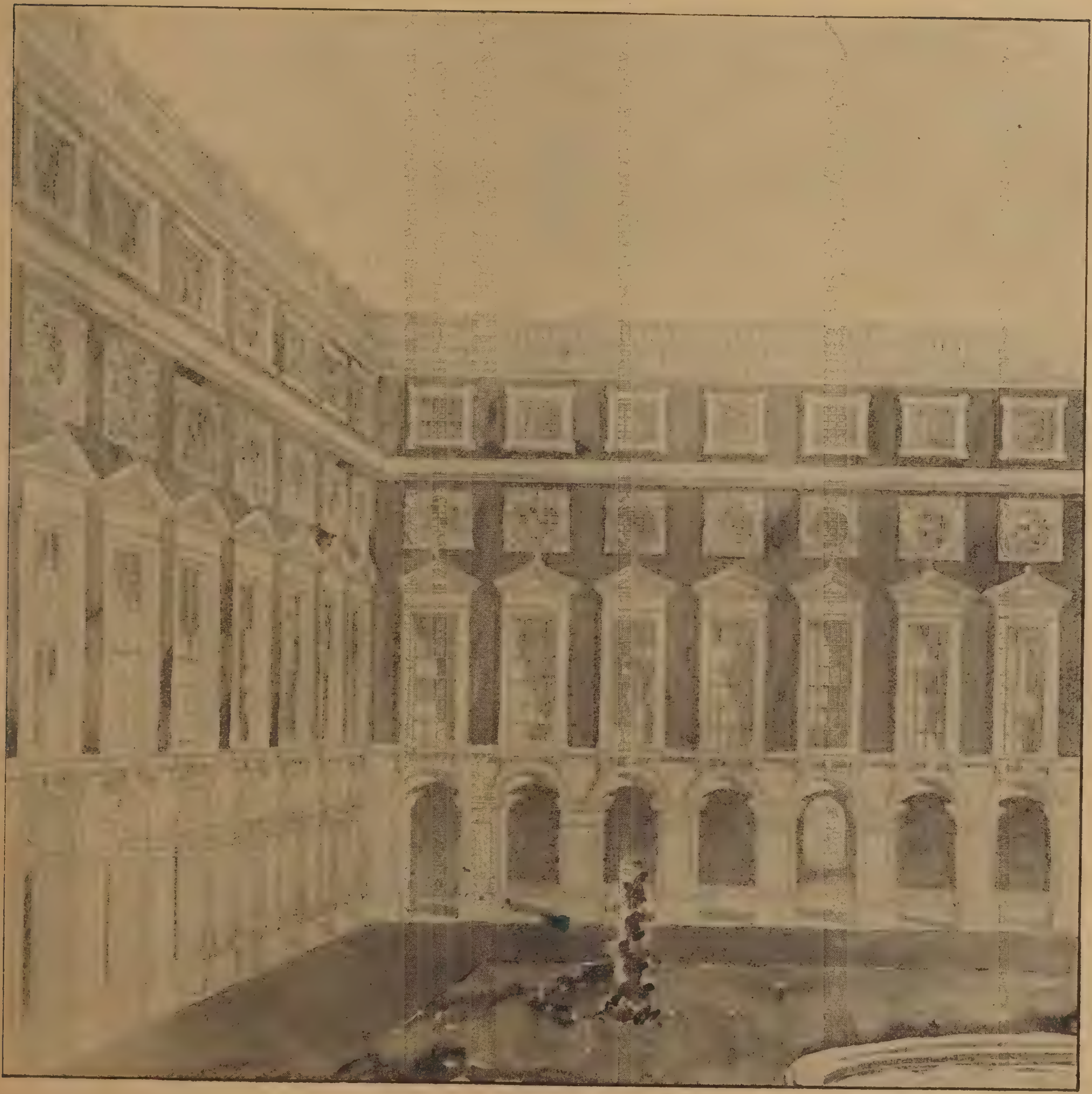

THE QUADRANGLE, HAMPTON COURT. Drawn by H. F. Waring.

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ARCHITECTURAL ASSOCIATION.

ANNUAL GENERAL MEETING.

(*Continued from page 147, No. CCXLIV.*)

PERHAPS the most useful addition made in connection with our social work is the new Common Room. I do not quite know whether to describe this little addition as a foretaste of better things to come, or as an apology for not yet getting something better. But this I can say; that the gentlemen of the committee, without in any way abating their individual and collective efforts to find suitable new premises, have fully realised the difficulty of so doing, and in taking and furnishing the new Common Room, have not only had the immediate comfort of the members in view, but also the business interests of the Association, as with the front room, the present premises have a commercial value which would render the disposal of the lease at short notice a comparatively easy matter. My most sincere wish when I last addressed you was that during my year of office I might be able to announce that new premises had been obtained, which would not only give ample

Accommodation

for our regular work in studio and class rooms, and for our social requirements, but would provide demonstration workshops for the craft side of our work. I will not weary you with again pressing my views on this subject, except to say that no stone shall be unturned and no time or energy stinted by myself during the present session in trying to satisfactorily solve the difficult question of new premises. I shall not, I think, be divulging Committee secrets when I hint that we have a large scheme at present under consideration, but I have had too many disappointments under this head to be over sanguine of success in the present instance. It is, I fear, too much to hope that it may fall to my lot to announce the good news that new and worthy premises have been found, but I sincerely trust that such an announcement may be made early in the new century.

The New Century.

What a strange influence these purely arbitrary divisions of time seem to have upon our minds, and even upon our actions—an influence that I cannot but think is for good in many ways. It may be from sentiment or from mere habit, or it may be from a sense of duty or discipline, but from whatever cause, the fact remains that there are a few who do not feel in some measure the influence of even a passing year—yet how indefinable and paradoxical is that thing we call time: the past is gone, the future has not come, and what we call present drifts into the past while we try to define it. Being what it is, however, the periods into which we divide it, marks, as it were, vantage points from which we can look backwards and study, as in a book, our successes and our failures. Gentlemen, this session of the Architectural Association is, as it were a bridge between the nineteenth and twentieth century, and as we draw near to the apex of that bridge or line that divides the two centuries, who is there amongst thoughtful men who will not tarry a moment to look back on the many wonders wrought during the last century—wonders in science that for better or for worse have transformed the face of the whole world; wonders in literature, poetry, and music, that have left the world much richer than they found it; wonders in art that will influence artists for centuries to come; wonders in architecture—yes, I think I am safe in saying even in architecture, if I add the words for better or for worse. But of this more hereafter. In all these wonders of the nineteenth century have we not infinite scope for reflection, study, and encouragement? Most strongly would I advise our students not to content themselves with only reading that which immediately concerns their own particular branch of art. If they would learn what real industry and perseverance means, and what it has accomplished, if they would know what little things have led to great results; in short, if they would learn the highway to success in life, let them, as a relaxation, read the interesting biographies of those who have brought about the wonders I speak of. The very word biography is, I fear, enough to frighten most of us, but I know of no more certain, and, in the end, more pleasant way of being helped forward in our life's career, than learning how others have gained success and lasting renown through their own perseverance and energies in the face of seemingly insuperable difficulties—and, above all, what have been the great motives and incentives that have guided them in their life and actions. But to return from the general view of progress in the nineteenth century to the more limited sphere of our own beloved art, what a strange and interesting page in the history of the century might be written thereon. The task of writing it will probably be undertaken by some enterprising author before long, and if carefully done, there should be ample material for an extremely useful and interesting volume, although the difficulty of following through the

Various Fashions and Heterogeneous Vagaries

of the last hundred years would, I fear, be great; but if episodes in the lives of the leading architects who have gone before, but left the stamp of their genius on many buildings, great and small, throughout the land, could be collected and incorporated, such a volume would, I feel sure, be much appreciated. The danger, of course, in reviewing the earlier work of the century is that we are too apt to judge work from our present standpoint. This danger becomes apparent even in ordinary conversation, as so few seem to be able to make allowance for the wholly different state of things existing, architecturally, in the earlier part of the century, and condemn those whose names in their day were looked up to by all. Are we, in these days, so sure of our own ground that we can afford to severely criticise a style of work that does not exactly coincide with our enlightened views of style? I am confident of one thing, that if we as a rule tried to find out the good points of a brother architect's work, instead of finding a kind of pleasure in picking out what we conceive to be the bad points, it would be better for ourselves, and

The Profession at Large.

In saying this, I do not for one moment wish that proper criticism should be curbed in any way. There is of course criticism, and criticism. For instance, a bad plan—misapplied ornament—palpable ignorance in detail, and bad proportion in building, poor construction or bad workmanship of any kind, &c., in which ca[illegible] severe criticism is most desirable, and even helpful, in that it makes one to remember what to avoid. But there are few buildings that one takes the trouble to visit that have not some good points in design or planning. Try then and find out those good points, and put away the bad ones as much as possible on the principle that "you never touch mud, but some sticks." There are numerous good points to study in the lives and works of the many able architects of the century. Architecture, as a great art, was in a measure dead in England at the commencement of the century. In what may be called the Stucco period, a bastard classic and Gothic style was the order of the day. What seemingly insuperable difficulties had to be faced by men who longed for a better state of things! What study, energy, patience, and enthusiasm were necessary to overcome the difficulties and prejudices existing! Who is there amongst us that will refuse to admire the pluck and perseverance of the early pioneers in the great cause of the raising of our art to its proper pedestal? Of course, with much of the work done in the early stages of the great architectural revival, we can have but little sympathy, but we can at least appreciate the motives that undoubtedly inspired men to aim at a higher ideal than was then prevalent. It would be hard to over-estimate the enormous influence that such books as Rickman's attempt to discriminate the styles of architecture in England, first published in 1817, together with the early publications of Parker, and followed by the writings of Sharpe, Paley, Pugin, and Brandon, have had upon the architectural history of the century. The earliest of these works prepared the ground for the great Gothic revival that followed in the forties, and following decades. We must remember, however, that this great revival was not brought about by architects only: it came like other great movements, in answer to needs and requirements of the times; it moved concurrently with the great religious revival that commenced at that period, it took firm root in the great seats of education, our universities, with the result that it influenced the minds of both clergy and laymen, who then took up the study of architecture with a thoroughness and zest that would shame many a student of the present day. Their heart was in the work, educated minds were stirred with a warm enthusiasm at the idea of the revival of what, in the truest sense, might be termed our national architecture. With such able men as Barry and Cockerell living,

The Best Traditions of Classical Work

were not likely to be lost, but it is the great Gothic revival in its various phases by which the nineteenth century will be most closely remembered architecturally. It has lately been the custom to talk slightingly of this revival, and of those great and able men who guided its destines. But gentlemen, to do so is neither just nor generous nor wise. The underlying principles that prompted such men as Rickman, Parker, Pugin, Paley, Scott, Burgess, Butterfield, Pearson, and others too numerous to mention, in their writings and their work, were of the highest and noblest character. These men spared neither time nor trouble in trying, by means of the most careful study of detail, to get into touch, as it were, with the artists who in past ages had left us buildings of such surpassing beauty. We may quibble and find fault with the doctrines of the early purist, who in his enthusiasm to truthfully follow the best detail of mediæval times, fixed arbitrary limits of right and wrong and good and bad in styles, yet in so doing he was only working on the same lines as the purely classic student, who is not content without giving verse and chapter for the proportion of every column and detail used. As in most revolutions, men are carried further than originally intended, with consequent injury to the cause they uphold, so undoubtedly by

The Gothic Revival

much irreparable evil was done by the excess of enthusiasm, under the name of restoration, with the same detrimental effect to the cause they held dear. But the first principles of the originators of the movement being essentially good, much good was bound to result from it; and there are very few architects living whose work has not in some way been influenced for good by the great minds that were connected with the Gothic revival. Fortunately the arbitrary shackles of style no longer bind us to rigid regularity of lines and detail. Men of great power and genius, whose early tuition was received in the Gothic School, have been amongst the first to lead the way in originality of thought and design, such as the late John Sedding, for instance. I have purposely avoided mentioning the names of living architects, amongst whom there are many worthy successors to the genius of the past, but I cannot refrain from mentioning one whose early training was also in the Gothic School, and whose work has had such untold influence on the domestic architecture of this century—I mean Mr. Norman Shaw. A study of his past and present work is, to my mind, a wonderful object lesson in development, but from first to last, whether it be in domestic, public building, or church design, always powerful, always thoughtful, and always artistic. The hard and fast conditions of style having been, by a sort of general consent, removed—what has been the result upon our art?—is the result satisfactory? In some respects, yes, in that the minds of clever men are given a freer scope for originality, or an eclecticism that is charming from the very boldness and knowledge it displays. In many respects, no, in that it gives an excuse for ignorant and badly educated men to thrust upon us such architectural abominations as have lately been allowed to disfigure some of the best streets of the Metropolis under the false name of originality and eclecticism. Emerson says somewhere:—" Great licentiousness treads on the heels of reformation"—and in architecture we cannot claim exception to this rule. But in spite of the

Glaring and Vulgar Designs

that too frequently crop up in our midst, I cannot agree with those who say that the architecture of the day is in a hopeless state. On the contrary, I think from the energy and enthusiasm that is being displayed on all sides in art generally we may take a very hopeful view of the future. Speaking generally, the design and planning of our public and private buildings show a great advance in many respects. Our churches are no longer slavish copies of mediæval work, and many of our houses and their decorations show an honest and often successful striving after better design in all that surrounds us. But there is one class of building which, from its position, and acres of ground that it covers, has, during the present century, assumed a far greater importance than is its due. I mean the modern villa or suburban residence, built by

Speculative Builders,

that surrounds us on all sides. What a terrible legacy of ugliness and bad building shall we leave behind, what a wilderness of worthless bricks and mortar. The demands for this class of building caused by the new kind of life in the present century have, of course, had to be met; but, artistically speaking, how unequal we have been to the task of meeting those demands. How far we, as architects, are responsible, is a question that it would be impossible to answer; but this is certain, that if we compare the ordinary present-day suburban house with a similar class of work carried out even in the last century, the comparison is, I fear, by no means favourable to us. The eighteenth century builders, as a rule, did not sacrifice good building to tawdry ornament. Their buildings were generally substantially built, and even if at times common-place, were at least quiet and reserved in design, and seldom if ever bespattered with the ghastly shams—vulgar terra-cotta ornament and worse than worthless carving.

The Modern House

of the kind is too well known to all to require any description. It assails us in all directions, not only in the suburbs of London, but in the neighbourhood of all our large towns. Nay, more, it is a disease that is contagious, and even the beauty of our homely villages and country roads is disfigured by its unwelcome presence. I do not say that this class of building was always good in past centuries, or is invariably bad at the present day; but this I do say, that there never was a time in which all that is true and good in building, and all that is pure and best in our art, was assailed by a more dangerous, insidious, and potent enemy than the demand at the present day for cheapness and showiness in our buildings, and the apparent indifference of the general public as to the artistic merits of the houses they live in. This mass of dreary ugliness that most of our people have to live amongst must act, and re-act, upon the mind, and do incalculable harm to the cause of art. The question is—How is the evil to be grappled with? First, I think by setting the example of quiet reserve in our own designs, and avoiding as far as possible the outward display of ornament; and when we do have ornament, seeing that it is the very best of the kind that we can get—and above all by never under any condition sacrificing solidity, or the use of the best materials, for the sake of being able to get more ornament in our buildings. Secondly, by doing everything in our power to influence landowners, when leasing or selling property for building purposes, to insist on the insertion of a condition as to some sort of supervision by a qualified architect. What an opening there is for early practice in this field of design for some of the aspiring members of our School of Design, and judging from some of the designs submitted last session, our suburbs would be far more interesting if enlivened by designs by even some of our students. It is not necessarily an expensive house that we desire or ask for. On the contrary, if

The Demand for Small Houses

is to be met, every reasonable and proper economy must be most carefully studied. I can well imagine a rough cast cottage being quite as good in design as a stone building five times more costly. Our aim should be to demonstrate to the public that a comfortable, artistically designed, and substantially built house does not necessarily mean a building that is more expensive than the ill-built erection at present so common, in which so much money is frittered away in utterly vulgar ornament. And here I would especially recommend students to really study the requirements of this class of house, with the view of making designs that shall be at once simple, reserved and artistic in treatment, and economical in construction; they will find it invaluable as practice, and it may be of the greatest use to them in their future career. We architects must be ready to grasp problems in design, whether they be great or small, and many will, I think, bear me out when I say that some of the seemingly small problems are often the most difficult to solve. Amongst other curious experiences I had once a client, who wrote asking me to design a lodge something in the style of Kensington Palace or the Versailles, a problem I met by sending a design which apparently satisfied her, but how far it agreed with her ideas of Kensington Palace or the Versailles I never found out. In my address last year I expressed the wish that

Artists and Architects

could be brought into closer union and sympathy with each other, and during the last years of the nineteenth century the great necessity of this union and sympathy has been very strongly brought home to us. This is neither the place nor time to enter at length upon the subject of the thorny discussion in reference to the decoration of our great Metropolitan Cathedral. But as the subject is of such great interest to architects and students alike, some allusion to it becomes almost a necessity. The objects of the opposition that we, as architects, have offered to the work of decoration must not be misunderstood. I think I am right in saying that most of us desire that our great churches and national monuments should be decked with the very best of all we can offer in art, be it in colour decoration or in sculpture. We must, therefore, beware that our opposition to the present method of decoration is not made use of by those who would denude our churches of all that is beautiful in decorative and sculptured art, and give us in return the bare, whitened sepulchres of a past generation. It cannot be made too clear that our opposition is on purely architectural grounds. I am convinced that the Dean and Chapter of St. Paul's when they started the work of decoration had but one wish and aim—that what they did should be of the best; and I am further convinced that Sir William Richmond entered upon this great work in the same spirit. But, gentlemen, surely the first qualification of any artist entering upon such a work is that he should be in complete and absolute sympathy with the architecture of the building he proposes to decorate. The results have proved that this is unfortunately not the case. Is it then unnatural that we should raise our voices against the injury done to the work of one of the greatest architects England has ever seen? As architects surely it is our duty to do so, and as Englishmen we have a right to ask that the walls of our great national monuments shall not be treated as mere spaces for artists, however clever, to experiment upon. I believe, however, that there is a growing sympathy between artists and architects, and the more we can do to foster that feeling the better it will be for art generally. It will be seen from the report of the last session, that in January, shortly after the publication of the design for the proposed new Vauxhall bridge the committee passed a resolution, stating that they "viewed with the utmost concern the manner in which it is proposed to rebuild Vauxhall Bridge." This resolution was afterwards approved with acclamation at an ordinary general meeting. Now, gentlemen, the Association does not concern itself, as a rule, with matters outside the immediate sphere of its own work, but representing as it does nearly 1,300 members, all of whom are deeply interested in the welfare of art and architecture, it could not look on with simple indifference at the proposal to disfigure our grand river with another ill-designed bridge. Most of the bridges that cross that river now are a standing rebuke to us as a nation. One can only hope that the County Council will use its powerful influence in securing the revision and improvement of the design before it is too late. Sir Alexander Binnie lately stated at a public dinner, amidst applause, that he had "visited and studied all the well-known bridges in Europe, and that, as a result, he hoped to give them one of the finest bridges of modern times." But I would point out, that the study of all the

Bridges

in the world will no more teach an engineer architecture than it would teach an architect engineering. What we desire is that in such a work as that in question, involving an expenditure of a large amount of public money, and effecting, as it does greatly, the appearance of our grand water-way, architects of eminence should invariably be consulted as to the architectural work, while the constructional work could, if so desired, be placed in the hands of well-known engineers. In such works in Paris, architect and engineer work together as as matter of course—why not in London? It is no pleasant task to criticise the work of men of such acknowledged ability as those just named, and we do not presume to do so within the province of their own art or science; but it would be simply cowardice on our part to refrain from criticism when they step into a sphere of work that is not their own, of which they have little knowledge, and with which they apparently have little real sympathy. Gentlemen, I must apologise if my brief review and comments of the work of the nineteenth century have seemed too long for an address of this kind, but, as I said before, standing so near the dividing line between the old and new century, one is almost bound to look back and try to learn from the successes and failures of the past, and how best to advance the interests of our great and noble art in the future. For the last half century the Architectural Association has been working with one pure and high aim — the advancement of architectural education. A voluntary association dependent almost solely on voluntary help and energy. A free and independent association unfettered by ties of professionalism or social class ties of any kind. A social association in which architects, young and old, rich and poor, can all meet together on one level, in social intercourse and good fellowship; and withal, gentlemen, I am glad to say a successful association. What, it may be asked, has been the lever of success? Has it been by capital or financial help given by persons or public bodies interested in educational work? In no sense, with the exception of the yearly grant of £100 so kindly made by the Royal Institute of British Architects, and the very generous donations given by some well-known architects at the launching of the new scheme of education. No, the lever of success has been the sincerity of purpose, the unselfish devotion to the cause, the single-hearted aim and warm enthusiasm of its originators and supporters. As long as men are found to help in carrying forward the work with the same high aim and enthusiasm, so long will the Architectural Association flourish and carry forward its great work with increasing vigour and helpfulness. We, the elder members of the A.A., have reason to fully recognise the value of both the educational and social work of the Association, but under the new system of education its value has increased tenfold; and it is for you, the younger members, to prove that its value is still greater in the future than in the past. It is a healthy sign that so many of our older members continue their membership, and I again appeal to all who are interested in the objects of the A.A. to join our ranks and help us by their membership and advice. When the members of the last excursion were visiting Bryanston, Lord Portman, seeing some elderly gentlemen in our party, asked me if the Association was composed entirely of students. I answered yes, that in our party of twenty-eight there were students whose ages ranged from eighteen to nearly sixty, from men who had been in practice for twenty-five years to pupils in their offices. So comprehensive are the ranks of the A.A. While mentioning the excursion, I must express surprise that more members do not take advantage of it, for a more useful and enjoyable week, both architecturally and socially, it would be hard to imagine. In drawing this address to a close, I would ask the younger students of the present day to remember how great is their responsibility. Upon them, in a great measure, will depend the making or marring of

The Architecture of the Twentieth Century.

It is impossible to foretell what their chances and opportunities may be, and equally impossible to foresee what will be the characteristic style of work of the century, and therefore it is useless to speculate upon the matter. But be sure of this, there is no broad highway to success that is not founded upon the work and experience of past ages. We are not gods, that we may create something out of nothing, but creatures who must make the best use of the materials and gradually growing knowledge vouchsafed to us by a bountiful Creator. Experience teaches us that to succeed at the present day a man must concentrate all the faculties of his mind on one great purpose, and with an unswerving tenacity of purpose. A great purpose is cumulative, and like a magnet attracts all that is kindred along the stream of life. The question is, Can you honestly say that you do, or that you wish to, make the art of architecture a great purpose in your life? If so, and you work conscientiously with that aim, I can safely prophesy your future success and happiness; but, if not, you had far better turn back, and give up all idea of becoming an architect. At best, as I said on a previous occasion, it is

A Hard-worked and Ill-paid Profession,

and if one's heart is not in the work, it becomes a mere existence without a soul. I do not, for one moment, wish to discourage those who are commencing their studies in the art. Far from it. My one great wish is to inspire enthusiasm amongst students who possibly have not realised fully how great is the work before them, and how great is the need of working consistently with one definite purpose. Believe me, I have no wish to make or exaggerate an evil. The evil I speak of—want of enthusiasm—undoubtedly exists amongst some of our students. Far too many make the end and aim of their work to qualify for the R.I.B.A. examination. But, good as I believe these examinations to be in many ways, you must not for one moment think that the passing of examinations will make you an architect in the truest sense. The key to the success of an architect is that his heart must be in his art. Ruskin truly says: "Fine art is that in which the hand, the head, and the heart of man go together, the head inferior to the heart, the hand inferior to the heart and head." Thus, it must be the heart that dictates your actions, or, in other words, real love of art for art's sake that must be your incentive to work. I would that any words of mine could inspire enthusiasm amongst our present and future students—for enthusiasm lifts men out of themselves and the petty concerns of life, it gives life to that which is otherwise invisible, it imparts itself magnetically to others, and fuses all into one happy harmonious unity of feeling and sentiment, and it helps forward the worker and the genius alike. If, as Longfellow says, "enthusiasm begets enthusiasm," then may I hope that my enthusiasm in the cause I am pleading may be imparted to you, and that your enthusiasm, once fired, may be imparted to others. In conclusion, I will only add that if you love art for art's sake you will not be content with obtaining knowledge and success for yourself alone, but will take pleasure in imparting knowledge to others, and thus helping forward, step by step, the great work of architectural education. I cannot end with better words than those of Shakespeare:

> This above all, to thine own self be true.
> And it must follow, as the night the day,
> Thou can'st not then be false to any man.

A vote of thanks was accorded the President on the motion of Mr. H. L. Florence, seconded by Col. Lenox Prendergast.

THE CLERGY AND ARTISTS' ASSOCIATION'S EXHIBITION.

By permission of the proprietors of the late Lord Leighton's house the Clergy and Artists' Association is holding its exhibition at No. 2, Holland Park Road, W., and as the Church Congress draws thousands of people to London just now, the time is very well chosen. The opportunity of comparing its contents with those of the enormous bazaar in the Imperial Institute, to which the said Congress has given its name, is one which should not be missed; the comparison will be greatly in favour of the smaller exhibition, and it should be courted rather than dreaded. The redeeming feature of the "Ecclesiastical Art Exhibition" is the loan collection of objects, which date from the earliest time. They number nearly 1,000 in all, and deserve to be made the subject of more than one article, but I can only refer just now to an item of exceptional interest—a collection of the precious stones named in the Bible. A treatise, taking these as its subject, is published by Simpkin, Marshall, and Co., at a very low price, and is likely to be very much in request, while jewellery as a fine art is being so assiduously practiced. Their merits apart, the stones of the Bible are so many emblems of sanctity, each having its recognised virtue and deserving on this account of all the love-labour that may be bestowed upon them.

To return to my subject, "The Clergy and Artists' Association" and its exhibition. A few general remarks must precede a brief notice of what appears to be excellent, and these will relate no less to house decoration and dress than to the fit and proper adornment of sacred buildings. The objection I have to objects pretending to be what they're not is that there appears to be no limit at all to the amount that may be disposed on the person excepting such as nature has set to the superficies, and the same may be said of all the sham stones that one sees—sham fabrics, sham feathers, sham flowers, &c.—so that the lowest in the social scale when arrayed in their best are usually the sorriest and tawdriest examples of human kind.

Now let us look at their houses. We see the same thing repeated; the same entire disregard of a principle which should be respected, namely, that there should be a sense of space about even the smallest apartment; a reserve of atmosphere in it. If only required for prayer, like a cell, we would have it as bare as we see it in Fra Angelico's frescoes. If for sleep, then just such things should be there as may be looked fondly upon at night-time and again in the early morning, the decoration attuned, as we say, to the *Schlaflied* and Morning Song. I would have a bit of the firmament about everything dear to me: the face of a friend, a pure thought, or a flower. Is this a fair way of introducing a subject, and proceeding to speak of the restraint we should put on ourselves, being artists? Let us have but a little, and that little the best that can be. It has been said, no matter by whom, that a cultivated taste, though it may not be cheaply acquired, saves more in the end than can be computed. Its possessor has not to think twice. He knows that there may be thousands of so-called art works produced, and amongst them the smallest percentage of things which anyone would be any the better for having.

There must be some wisdom in Mr. Hallward's prospectus, for he agrees fairly well with what I have said. "The question of good art in churches is after all not one of money," nor one to be overcome by money only, because large sums are being spent in our churches, and the money is thrown away! Nor is the artist himself so expensive as he is supposed to be, because "instances come under our notice in which he charges less than the trade."

It appears that his association is supplementing the good work of the Society for the Protection of Ancient Buildings without interfering in any way with it. The way that society works is well known. It solicits inquiries as to the best means of treating a building, and simply says what should be done. So here, in like manner, we find a number of cases reported in which entirely disinterested advice has been given. If the applicant says that the parish is poor, he is told that a little will go a long way. The tawdry adornments of Roman churches abroad are amongst the most terrible sights that one sees, and yet we cannot but feel for the innocent givers, because poverty never seems crueller than when the poorest give of their best.

A good deal of the work which is shown is merely indicative of what may be done for a church by the substitution of beautiful things for those that have served hitherto, and it would be unwise to pass judgment upon it. This is particularly true of designs and cartoons for church windows, of which a great many are shown: but other exhibits are so far complete in themselves as to be coveted just as they are—such as this beautiful altar-piece, a painting in oil designed for St. Paul's, Bury, near Manchester. The church was visited lately, and it was observed how complete a reformation had been effected by Mr. and Mrs. Hallward, Miss Bloxam, and Mr. Bainbridge Reynolds, working as one. The style of the church (nineteenth century Georgian Lancet) is depressingly bad, and not even remotely resembling anything truly Gothic; but description would fail, and the work done under Mr. Hallward's direction must be seen to be appreciated. We see here what could have been done had the artist and his associates been perfectly free as at Teddington.

Of unforgetable grandeur is Mr. A. H. Skipworth's organ front, designed for this church, and beautiful, eluding description, is the altar frontal shown by Miss Bloxam. There are very few cases in which the exhibited works seem less than the artists' best, and very few artists, indeed, whose contributions are not very heartily welcomed. I wonder who will be first to disclose to the world the genius of Mrs. Traquair who exhibits a "book of photographs, frescoes, and tapestries." E. R.

A Wise Precaution.—The passenger lift shaft at the Windsor Hotel, Victoria Street, Westminster, has just been fitted with non-flammable wood throughout. This measure of safety from the dangers of fire will be appreciated by those occupying upper rooms in large hotels.

Forthcoming Art Exhibitions.—Next week the Grafton Galleries will re-open with a collection of modern French art. The annual exhibition of the Society of Portrait Painters will be held in January and February, 1900. Next March the New French Club and the Ridley Art Club will hold their exhibitions, and there will also be an exhibition illustrative of the life-work of George Rowney (1734-1802).

THE A.A. SCHOOL OF DESIGN.

OPENING ADDRESSES.

THE preliminary meeting of the Architectural Association School of Design and Handicraft was held on Tuesday, the 10th inst., at 56, Great Marlborough Street, W., at 7.30 p.m. Short addresses were given by Mr. G. H. Fellowes Prynne, F.R.I.B.A., the president of the Association, Mr. W. H. Seth-Smith, F.R.I.B.A., and Mr. Halsey Ricardo. The President warmly congratulated the members on their work in the School of Design; notwithstanding the falling off during the last session, on the whole the work had been most encouraging. He wished to point out the value of the Association, which had grown gradually from the needs of architectural students. He would not mention names, but amongst their members they had men of considerable standing in the profession. The first questions he would ask anyone wanting to join the Association were: Why did he wish to join? and why was he taking up the profession? Was it merely for the love of the work? Many took it up, he was afraid, with the sole idea of it as a profession, and with no actual and real love for the work. Surely that was the wrong way to go into architecture? It was not a trade, but an art! There was a much higher aim necessary in entering the profession, and that was the improvement of the art of architecture; if enthusiasm was not felt for this, the profession should not be taken up, for it was not a well paid profession, indeed it was a very poorly paid one. The seniors of architectural students could not pay them as they should be paid: although a man might be very busy, it might be on small and unremunerative work. The ideal architecture was that which truly united painting and sculpture with it. To accomplish any good in all the arts it was necessary for every student to make up his mind to study painting and sculpture, and equally it was necessary for the painter or sculptor to understand the principles of architecture. The problem of the architect was to know how to deal with masses and proportion, light and shade and general effect, but to do this he must know how to deal with other arts. Architecture was of course more complicated; it was more utilitarian; there were many points to be studied which did not belong to any art, and enthusiasm must be felt, if it could be done, for such subjects.

He supposed everyone about to enter the office of an architect was possessed of some artistic capabilities, and therefore, he would say, the first object was to make oneself absolutely proficient in drawing, which he considered just as necessary as it had been for many years past, not only in freehand but in geometrical drawing. In drawing there was no greater danger than that of inaccuracy; in asking students to study drawing he meant them to study it very deeply. They should make up their minds, also, to do as had been done in the past, namely, measure work, and in connection with this he would mention that the Architectural Union gave a prize for such drawing of old work; this might be an extra inducement. In studying the planning of a building the good points should be things to be found out, for there were too many critics who kept on criticising the little bad points of detail. These bad points would be sure to impress themselves on one's mind without seeking. Although great proficiency in drawing might do immeasurable harm in leading one to make false drawings, generally speaking, proficiency in drawing must be a great help. Absolute trueness in drawing must be insisted upon, if only from matters of policy, for if a client saw a building was entirely different from the drawing, the architect's future was ruined.

Mr. Prynne urged the study of the practical side of building, and he deprecated the cramming to pass examinations, for, he said, that would only make bookworms, and not architects. He urged students to visit every building possible while it was in course of erection, and watch the capabilities of the building and the methods of construction, to get in touch with the workmen, so as to be able to show them how to do the work.

The study of old work was being given up, but this was most reprehensible; if possible, the goodness in other men's works should be grasped, but the work should not be copied, or, in other words, he would say: Build on the foundation of the past. In regard to the question of modelling, he thought it was very necessary for an architect to realise ornament at a height. Modelling gave an enormous advantage in enabling this to be done. A bad thing was the throwing-on of ornament; ornament should not fill up the spaces in a building, but grow out of the design and with the design.

In concluion, he wished to say as few words on the greatness of an architect's work. It spoke of the national characteristics from generation to generation. It might influence the minds of persons in the future, as architecture of the past had influenced them. The aim should be as high as it possibly could be, and to attain any good result, industry and enthusiasm were absolutely necessary. Surely it was unnecessary to say that industry was all in all. In painting and sculpture there were definite lines to go upon, but in architecture there were so many things to study. If anyone failed in his work as a student or as an architect he should not be discouraged, for it was by failures they learnt: how much could be learnt if anyone would have the courage to write a history of failures. He could not end with better words than:—

> If what shone afar so grand
> Turn to nothing in thy hand,
> On again, the virtue lies
> In the struggle, not the prize.

Mr. W. H. Seth-Smith followed with a short address on the application of architectural ornament. He said it was a platitude to say that art knew no rules, that feeling was everything. It would be found, however, that although the instinct of a great painter was his best guide, his exceptional ability would have led him to have analysed the works of his great masters, and to have discovered in all of them certain leading principles in their composition, chiaro-oscuro, or schemes of colour; and that he would, in process of the creation of his own works, be governed, however unconsciously, by these principles, and in the event of criticism might apply them as both a test and as an apology. The presidents of our Royal Academy had at any rate thought it worth while to lay down laws for the guidance of their students.

Be this as it may, genius might always be safely left to take care of itself. All were not geniuses, nor was it possible, whatever tests might be applied, to exclude from the artistic calling men who had very little capacity for feeling in design; hence the importance of ascertaining whether any rules exist by which great errors might be prevented in the application of ornament. It was where art teachers had gone beyond this that more harm than good had been done. As the suggestion of principles for the design of ornament either in form or colour was too complex a subject to enter upon that night, he would content himself with a few thoughts on its general application.

It could not be too often insisted upon that the principal object of ornament in architecture was to give beauty to constructional features, and that by keeping this in view our art might, and would, improve our construction. He would suggest the following principles as headings for consideration:—

(1) Rotundity or modelling of the angles, or, as we all call it, mouldings.—The reasons underlying rotundity were, first, the sense of stability produced by rounded corners, and, secondly, the gradation of light, shade, and cast shadow thus produced. Plinth and base sets-off, pier-angles, shafts and their capitals, arches, and vaulting ribs, &c., were the leading lines calling for such modelling.

(2) Ornament against high light.—This was the lithic rendering of a truth observed by all great painters, namely, that the lights must be beautiful in form. The eye of man, in common with other specimens of natural history, went at once for light Too much thought or care could not, therefore, be spent on tracery, which was clearly evolved in obedience to this great law. Grilles, bars, ornamental lead glazing, and window fastenings had a similar origin. Skylines came under this head. The rule seemed to be that though the general constructive skylines might be very severe, they must be softened by well-modelled ornament. In all satisfactory instances they were rounded in form. In Gothic, the crestings, crockets, finials, gargoyles, &c., produced the desired effect; in Classic or Renaissance, statues and vases, &c., supplied the want. Sharp pointed finials and vases were always painful to behold, whereas a more substantial terminal of good form, producing a dark spot against the sky, was most picturesque. Diapers might also be instanced, and other enrichments of plain surfaces were exposed to direct light.

(3) The richest ornament must not be in the highest lights. He believed it was this reason which led the thirteenth and fourteenth century artists to stain their windows with such deep tones that they should not allure the eye too readily from the architectural ornaments of the interior. In those days the artists worked in unison, and the worker in glass subordinated his work to the great scheme—the one master design. It was only later that the glass-worker sought to glorify himself by white glass and more elaboration of detail, casting patches of shadow and colour to the confusion of the ornament of the interior. And this was further proved by its happening when the area for glazing was at its maximum and less, and not more, light was wanted within. Exactly the same sacrifice of architectural effect to skill in carving was to be seen everywhere in the fifteenth and sixteenth centuries, directly the Renaissance, with its enthusiasm for surface ornament, arrived. It was in the half lights that the great sculptures should be found, and their subject of greatest interest would be led up to gradually, first by means of a frame of mouldings or other architectural enrichments proportioned to the complexity of the sculpture composition. It was only in the depths of the sculpture itself that colour was allowed in the best examples of the best periods.

(4) Solidity.—Enrichments should never be allowed to undercut the constructional lines. Carving was apt to sin here. Architectural carving, in its most simple application, was generally required to beautify awkward transitional spaces, such as the bells of capitals, corbels, bosses, and various other intersectional features. The Corinthian capital was an illustration. Carving tended to reduce the sense of structural resistence, hence, in good Gothic periods, shafts are never enriched. On the other hand, where, as in the Parthenon, the columns exceed in bulk the requirements of superimposed weight, but are needed for other structural reasons, they have to be enriched by flutes.

(5) Concentration on eyeline.—Ornament was interesting in proportion to the thought it embodied, and, therefore, if of a popular character it should, like other good works of fine art, be placed where it would be seen and most valued. In domestic work doorways, fireplaces, dadoes, formed good fields. If of sacred nature it should be in places which would give the best opportunity for reflection. The enrichment of vistas such as the ends of aisles, corridors, &c., was of great importance since the eye was immediately led up to them by the converging perspective lines.

(6) Weathering.—In the best periods much attention was bestowed on protecting ornament from injurious weather. These rules just enumerated should not be rejected, because many beautiful inconsistencies might be discovered, for art was full of charming contradictions.

It must be ever kept in mind that good jointing as an element of constructional beauty was of immense importance in the form of the joint and colour of the cementing material, but this came under the head of textures and not of ornament.

Mr. Halsey Ricardo then followed with

some notes on "Detail." He said he used to hear it said—when he was a pupil—that "a good building could carry off bad detail, and a bad building be saved by good detail." This was consoling; because, whilst good building might be beyond one's reach, one could learn up the correct rules for good detail. But the aphorism unfortunately was not true: Building and detail were not separate qualities. A building could not be put up and by being endued with detail converted into architecture. In putting one stone upon another it revealed thought or want of thought. Detail depended on the way the problem before one was tackled, and the knowledge of the capabilities of the material meant to be used. The more thoroughly the structure of the work was entered into the more interesting the detail became. There would be no want of detail, and the more thought put into work the more pleasure there would be to come out of it. One lived now in a very learned epoch, learning had been most exhaustively collected and summed up, and the tendency was to bolt it rather than to digest it. The matter of detail was approached from the Academic rather than the humorous point of view, and detail became deadly learned and learnedly dead, instead of alive and inevitable. Our point of view, although learned, was artificial. The masterpieces of the past were admired for excellencies other than those for which their creators won their fame. Their work was seen incomplete, and the lack of finish, that would stupefy the artists could they see what we were admiring, was exalted.

All agreed in admiration of the Elgin marbles, yet every Athenian of the Classic age would be horrified to see in what state the temples and sculptures are that are now so carefully hoarded. "The beautiful purity and translucency of the marble," that is talked about, was nothing especial to them, whereas the colour that made them life-like and friendly, that they did value. Much of Greek and most of the Roman work that was seen now, and elaborately measured and reproduced, had lost its fine marble-stucco coating and its delicate nuances of form, as well as colour. The detail of Classic Roman work relied on these refinements, and was incomplete without them; but we had got into such an attitude of estimating these ruins that we should shriek at the notion of restoring them with stucco and colour; we were so out of touch with them that we neither cared, nor wished, to do so. But Classic work and Mediæval work depended immensely for its effect on colour, and so at the outset did the Renaissance. But with the revival of letters came the new point of view, and art became the cult of the learned few and popular no more. The character of detail changed. In the Middle Ages the people identified themselves with their buildings, contributed money, time, and experience—the building was the outcome of many hands and many hearts—with so much ready and passionate co-operation, it rioted in its wealth of detail, and the hands that contributed this enthusiastic labour were the hands that had grown up on the material they were now touching. Every moulding recorded a mason's experience—romance and experience met together in it—each new vault was the outcome of observation, jealous as well as ambitious. A man carved his woodwork to his own fancy in the detail, and recorded with his chisel his view of that perplexed problem —his life. Detail had a point and a sting in it then—it was so very real, and it aimed at being so audaciously real! Then came the learned professionals full of the stores they had gathered from classic grounds, and the "one man" system of erecting a building. He came with his academic principles, his sketches, his scenic frontispieces, his new mouldings and generally exotic view of life. For long one did not see the unreality of his wares. The craftsmen had their tradition: they played up to him as best they could, and, thanks to their tradition, their support was amazingly good; but under the system their tradition weakened. The tasks set them got stranger and stranger and more inexecutable: marble details suitable to the climate of Italy to be executed in granite at Aberdeen: stone details to be rendered in wood, wrought-iron details to be made in cast-iron—how could Art be popular, if these unrealities and ignorances were what she depended on. The more and more "correct" detail got, the more and more foreign and insincere it became, and the more uninteresting, except to the pedant. It was owned, at the time of the Gothic revival, but then there was no fund of tradition to fall back upon, as there was in the sixteenth century, and the revived Gothic was really as baseless as the Renaissance.

What then was the moral? What had we to be after to-day? We had to make our detail interesting, sincere and redolent of the time we lived in. It would be interesting in proportion to the amount of care for it and of heart put in it. It would be sincere and flavoursome according to the amount of knowledge we possessed. Our hand must be on the material. We had all the past to dip into as a vast storehouse, but we were not to ignorantly tease stone into purposeless mouldings nor fret woodwork into unnecessary joinery. Through all the perplexities of each job, the bare facts of the case had to be riddled down to, and then seen how they could be combined and in what guise. Every detail should be questioned as to its function, and unless it could pass that ordeal, disallowed. We lived in new times, when materials were comparatively cheap and labour was dear. There were facilities for transport unknown in even the recent past; there was machinery in superabundant quantity (because not knowing how to use it, it had recklessly driven ahead anywhere and with anything, and our work, if it was to have any vitality, must recognise and make use of these forces. At present they were used in such violence and in such quantity that the man behind them disappeared, and without him went the pleasure and interest. What could be duller, for instance, than a lot of machine-made panelling unless it was smothered in hand decoration. Technically, it was actually superior to hand-made panelling, and it had the beauty of perfection—but something more friendly was wanted than the heartless output of the machine. The help of machines could not be done without, but their work should not be much in evidence. The machine really was to replace servile and unskilled labour; where skilled craftsmanship was wanted there the man must be used. The fearful fertility of the machines had a tendency to alter our standard of what was necessary, and to choke us with a mass of inanities, which were forced upon us to justify this uncalled-for production; and this facility showed itself in restless, purposeless detail. But what was the point of detail? If it was to show how rich we were, it was vulgar and inoffensive; if it was to show that we were thoughful and in earnest, it must necessarily be restrained; if it was to show that we were happy in our work, it should be as widespread as happiness would allow.

A vote of thanks was heartily accorded to Mr. Prynne, Mr. Seth-Smith, and Mr. Ricardo, on the motion of Mr. G. B. Carvill, and they having briefly replied the meeting terminated.

The Theatre Royal at St. Helen's, built in 1890 at a cost of £13,000, was totally destroyed by fire on October 13th.

Kirkcaldy Memorial Halls.—The Adam Smith and Beveridge Memorial Halls at Kirkcaldy were opened on October 11th.

A New Bacon Factory at Devizes, Wilts., has just been erected by Mr. Henry Ash, of Devizes, for the Central Wiltshire Bacon Co., Ltd.

The Design for Saltwood Almshouses, illustrated is one of our centre plates this week, was submitted in a competition, and has not been executed. The author is Mr. Beresford Pite, F.R.I.B.A.

The Death is Announced of Mr. E. J. Cobbett, of the Royal Society of British Artists. He was represented by one or more canvases at the Royal Academy for more than thirty consecutive years.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"My first and last secret of Art is to get a thorough intelligence of the fact to be painted, represented, or in whatever way set forth—the fact deep as Hades, high as Heaven, and written so, as to the visual face of it on this poor earth."—THOMAS CARLYLE.

The Sad Condition of York Minster. ALTHOUGH quite £100,000 has been spent in keeping York Minster in a safe condition during the last seventy years, we are informed that at least £50,000 more must be collected at once if the structure is to be kept from impending ruin. It is said that the west front is so unsafe that the great door cannot be used, and the pinnacles and other decorative details are in such a bad state that the fall of pieces of masonry is of frequent occurrence. An appeal is being made for subscriptions to cover the cost of thoroughly renovating the Minster, and if one of the most beautiful examples of ecclesiastical building is to be preserved for the admiration of future generations, the appeal must be responded to liberally and immediately. Up to the present only £12,500 has been collected out of the £50,000.

Chepstow Castle. IT would be a pity if this ancient Monmouthshire stronghold were to fall into the hands of one of the many manufacturers who seem to be always on the alert nowadays to buy buildings of its description for their purposes. Why they should is a mystery. When it was put up for auction last Thursday it failed to find a purchaser. The auctioneer then remarked that the castle had once been used for manufacturing purposes, and the vendor could not be blamed if it were so used again. Structurally it is, perhaps, the finest of the Monmouthshire fortresses. It is splendidly situated, commanding the mouth of the Wye, and dominating the little town of Chepstow. Its shape is that of an irregular parallelogram, 750ft. in length by from 50ft. to 160ft. in breadth, and the great hall measures 90ft. by 30ft. It contains four courts, the first of which is the Drum Tower. When it was announced about a year ago that the Monmouthshire estates of the Duke of Beaufort were to come under the hammer, it was hoped that the historical buildings remaining thereon would be secured as public property; but Castle Usk has already passed into private hands, and whether Chepstow Castle will or not is impossible to say. It is to be hoped, however, that even now the National Trust may be able to secure it for the people. The historical tower gate, which was built in about the thirteenth century, has been presented to the town by the Duke.

Clergy and Art. THE members of the Clergy and Artists' Association held a general meeting at Leighton House, Holland Park Road, Kensington, last Wednesday evening, to discuss certain draft rules which had been submitted by the committee. One point upon which considerable discussion took place was the relative positions of the clergy and the artists in the Association. The Bishop of Dorchester, who presided, said he did not think the Association would succeed or endure unless it were supported by both professions. Mr. Holman Hunt thought that in the shaping of an institution which was to have the control of artistic matters, they ought not to have the elections from within, but that the general body should elect the officers. Some institutions had suffered because the voice of the body of the profession had not been heard at all. The chairman thought that the clergy would not enter the alliance unless they had a fair share in the control of the committee, but he did not think that they would encroach upon the province of the artists. He thought that the allotment of the work should be discussed in general committee. Eventually the draft rules were referred back to the committee in order that they might bring forward something definite at the annual meeting. To us it seems but natural and fair that each profession should have an equal voice in the control of the association, which has been formed in the interests of both.

What do you Think of Ruskin? Mr. Ruskin was taking a morning walk not long ago near Brantwood, says a contemporary, when he saw a woman sketching the house. With a courteous grace which is intensely his own he addressed her, inquiring her reason for choosing the house in question for her subject. "It is the house of the famous John Ruskin," she frankly answered. "Have you met Ruskin?" she was asked. "No, indeed," she replied. "If I had I would have deemed it one of the greatest privileges of my life!" "Then, madam, if you care to follow me I will show him to you." The artist eagerly followed the guide. To her surprise and gratification, he led her up to the house, and, entering, bade his guest follow. On marched the stranger into the drawing-room, and, then, placing his back to the fireplace—a familiar attitude—he exclaimed, to the amazement of his companion: "Now what do you think of Ruskin?"

St. Leonard's, Shoreditch. The work of renovating the Parish Church of St. Leonard, Shoreditch, is now nearly complete. The church had been allowed to fall into a ruinous condition, although it possesses one of the finest examples of classic spires in England. In Saxon times a church stood on the site of the present building; this was superseded at the time of the Conquest by a Gothic edifice. The present church was built from the designs of Dance, who was a pupil of Sir Christopher Wren. Evidence of the master's influence is to be distinctly traced. The church is composed of three sections—tower, dome, surrounded by Corinthian columns, and spire, which springs from the dome. The body of the building is a fine example of pure Tuscan. Many of the actors of Shakespeare's time were buried in its yard, and from this circumstance it gained the name of the Actors' Church. In the church there is a peculiar monument in representing a couple of large skeletons "tearing at the Tree of Life," and bearing in Latin an epigrammatic inscription which states that the skeletons "were all that the worms had left." The crypt extends under the churchyard into High Street, and contains about 5,000 coffins and the old parish stocks. The stocks are to be mounted near the church as interesting relics.

Its Bells, Clock, Spire, and Interior. The peal of bells in the tower is a very fine one; some of them did duty in the Gothic church. The bells, which number twelve, have been out of order for the last three or four years, but have now been seen to by Mr. Dent, of Cheapside. The clock has four faces, and has been going so irregularly that no reliance has recently been placed upon it. It has now been repaired, and the dials are lighted by electricity. The exterior of the building and spire have been thoroughly renovated, and a scheme of interior decoration, prepared by Mr. J. R. Brown, Harrington Street, Hampstead, has been carried out. The church is now lighted by electricity, installed by Mr. C. H. Doughty, the lighting engineer of the vestry. The churchyard has been turned into a recreation ground, and paths have been constructed. Sir Arthur Blomfield supervised the whole scheme of renovation and decoration, and although so much has been done the cost is estimated at only £2,100, towards which £600 has been raised.

Fashion and Architectural Taste. In the course of a lecture on "The Influence of Fashion on Architectural Taste," read recently before the Glasgow Architectural Association, Mr. Wm. J. Blain pointed out that previous to the last century the styles and fashions of Architecture had a continuous growth and tenacious purpose extending over long periods and brought to decay by political changes and revolutions of thought, but that with the birth of the present century only diminutive growths were observable, lasting only for short periods. The reason for this, in the author's opinion, was the decentralisation of culture, the spread of literature, and the study of modern languages and people, etc. Mr. Blain said that these diminutive growths, which had generally taken the form of revivals of various styles, such as the Classic revival, the early Gothic revival, the Dutch and Spanish revivals, and the modern Georgian revival, had not been without some lasting benefit to Architecture, books having been written, buildings sketched, measured and catalogued, and a vast storehouse of information accumulated about the various styles. The very mistakes of the revivalists had caused a deeper searching and insight into the spirit of old work, and we at last possess the key to the ideal chain of these buildings, thus paving the way to a development of style on a broad basis. In conclusion the author remarked that he had no sympathy with an art which recognised no tradition or style, and that a building without style appeared to him about as uninteresting as a man without character.

Chinamen and Tramways. Examples are constantly recurring of the tardiness of China, a land where matters seem to have made a lasting halt. We are, therefore, not surprised at anything which the Chinaman may do as an exhibition of resentment to Western customs or new ideas. It appears that cable cars have been introduced into Corea, and that several children have been run over and killed by them. With a nation so superstitious as the Chinese, this would naturally be a terrible thorn in the flesh, and the result was that one day several hundred persons burned one of the cars, smashed another, and nearly killed the Japanese and European engineers. What connection is there between electric tramways and drought? Apparently none to us, who have little perception; but, according to the inhabitants of Seoul there is a great deal, and this is the reason why they destroyed the cars.

The Fallen Columns. Reports have recently come to hand of the fall of nine columns in the great hall of the Temple of Ammon at Karnak. Before these fell, the roof of the building, which consists of great square stones, was supported by no fewer than 134 columns. Of these, 122 measured 42ft. in height, and the remaining twelve central columns measured 69ft. by 12ft. diameter. The columns are so huge that they are not true pillars at all, but merely columns of masonry put together in the usual manner. An ordinary stone column, such as Nelson's Monument in Trafalgar Square, is formed of solid stone sections with a metal core, but it was, of course, impossible to obtain sections measuring 12ft. across, so these hollow shells of masonry were erected, and their centres were filled with mortar. It is interesting to note that they belong to the last form of Egyptian pillar, when the desire for flat surfaces on which to record great deeds overcame every other architectural instinct. Hitherto the columns had shown the ribbings which symbolised the bundle of lotus stems, in imitation of which the pillar had originated, but at the time of the building of the Temple of Ammon wall spaces were insufficient for record writing, so the columns had to be smoothed to give yet more space for hieroglyphics.

The Buildings of Pretoria. Now that war is raging in the Transvaal, it may perhaps be of interest to refer to some of the buildings in Pretoria, which, while Potchefstrom is the constitutional capital, is the seat of administration, as Johannesburg is the commercial centre. Pretoria is about thirty-seven miles from Johannesburg, and is surrounded by the Witwatersburg Hills; it is about 4,500ft. above sea-level. The Government Buildings, or Raadzaal, are the chief glory of the town. They have a frontage of 175ft., a depth of 220ft., and a height of 125ft. from the ground to the top of the figure of Liberty on the principal tower. They contain in all 136 rooms, including accommodation for the chief officials, and two chambers for the Volksraad. The buildings were erected from designs by Mr. Wierda, at a total cost of £138,000. They occupy one side of Church Square, in the centre of which is the large Dutch Reformed Church, while all the principal banks have their offices in this quarter. The Supreme Courts are located at Pretoria, and the President's house is there, while the principal railways in the Republic converge to this centre. The population of the town is estimated at about 14,000 persons, of whom about one-half are coloured, these being Zulus, Malays, and Kaffirs.

South Kensington "Rubbish." The exhibits from the South Kensington Museum that have been circulated throughout the country have received varied criticism, but that given at a recent meeting of the Carnegie Public Library Committee at Ayr is the strongest which we have as yet heard of. The Science and Art Committee had proposed to apply to the South Kensington authorities for a loan collection, so that the students might see these works and be imbued with a proper spirit of art.—Mr. R. M. Beveridge got up and said he had seen articles from the South Kensington Museum, and they were the paltriest, dirtiest looking things he had ever set his eyes on. He saw some of their works in Paisley, and they were rubbish. —Bailie Smith said if they wanted works they should get them from local artists. These would be more interesting than articles from South Kensington.—It was resolved that a committee should look into the matter and report. We await that report with feverish impatience.

Keystones.

Change of Address.—Mr. Horace T. Bonner, A.R.I.B.A., architect and surveyor, has removed to his original offices at Nos. 13, and 14, King Street, Cheapside, E.C.

A New Technical School at Dunfermline was opened on October 10th. The architect is Mr. David Barclay, of Glasgow, and the cost is between £10,000 and £12,000.

Mr. Gladstone's Statue, which is to stand in the Houses of Parliament, is making progress, and Mr. F. W. Pomeroy (the sculptor) thinks it will be in position early next year.

New Premises.—Owing to a large increase in business, the Patent Vulcanite Roofing and Asphalte Co. have secured City offices at 2, New Union Street (near Moorgate Street station).

A Memorial Porch at the ancient Abbey Church of Tempringham has just been dedicated by the Bishop of Lincoln. The porch has been erected in commemoration of the Queen's long reign.

The French Pictures at the Berlin Kunstacademie are greatly appreciated. It is thirty years since French artists have shown anything like a general desire to exhibit at the German capital.

Miss Francis Power Cobbe, philosopher and humanitarian, who is now seventy-seven years of age, has offered to bequeath her library of 3,000 volumes to Barmouth. A committee are now appealing for £2,000 to build a library.

New Technical and Secondary Schools at Chippenham are being built from designs by Mr. Robert E. Brinkworth, F.S.I., at a cost (exclusive of site and fittings) of £4,310. The contractors are Messrs. Smith and Light, of Chippenham.

"Eclipse" Roof Glazing.—Messrs. Mellowes and Co., of Sheffield and London, have recently completed the glazing of the new Great Northern Railway Company's Goods Depôt at Manchester, and also of the new engine sheds at Hornsey, London N.

Correspondence.

MODEL ANSWERS TO EXAMINATION QUESTIONS.

To the Editor of The Builders' Journal.

Kirkcaldy.

Sir,—I cannot understand why the authors do not meet the requirements in Question I. (page 134, No. CCXLIII.) on construction by inverted arches between the foundations of the detached columns. The question seems to me sufficiently clear to judge the remedy hinted at.—Yours truly,

D. FORBES SMITH, A.R.I.B.A.

[We do not quite understand Mr. Forbes Smith's point. The method of construction by inverted arches is distinctly suggested in the reply.—Ed.]

"RICKMAN'S GOTHIC ARCHITECTURE."

With reference to the enquiry and answer about this book, which appeared on page 132 of No. ccxliii, we have received a letter from a correspondent who possesses a well-preserved copy which he is willing to sell. If H. R. (Londonderry), who made the enquiry, will let us know his address, we will put him in communication with our correspondent.

A QUESTION OF CULT.

To the Editor of The Builders' Journal.

Dear Sir,—Two of your readers make merry over a little drawing published in your issue for September 20th, entitled "Houses at Claygate." Evidently Aubrey Beardsley, arts and crafts societies, and anything other than the average commonplace, form subject matter for derision by these merry writers. So be it. But, to be quite fair, are the trees and cloudland held up to scorn a whit less absurd than are the sad and labouriously-fashioned realistic architectural trees, which defy alike classification and Nature's laws; and who shall make bold to say whether the average realistic sky is of winter or summer, or of how many suns there be in the architectural draughtsman's firmament, whence emanate those conflicting rays which illumine his realistic picture? Surely these uncertain trees and ambiguous clouds are as manifestly manufactured in the office, and not studied from Nature, as are the most conventional of Noah's Ark trees, or, in your correspondent's nomenclature, "kidney bean" clouds, yet evolved.

A "realistic architectural picture"—save the mark—can never truly be realistic, or, if it ever seems to touch the higher altitude of realism, it passes thereby, and at once, without the category of our definition. Whether, then, accepting the limitations of the architectural palette, it be wiser to ape the sublimely realistic, and become thereby sublimely ridiculous, or frankly to accept the convention in a conventional art, is a matter depending wholly upon the inclination and judgment of the individual draughtsman, rather than upon that of the oftentimes incompetent, but I hope in your correspondents' case, only playful critics.

Is it not, sir, something of a pity, that one whom you term "a well-known architect," should be found flouting at work which, however eccentric, is yet not without ability; and instead of seeking to extend the stronger hand of help to one who, for ought I can tell, may be, and possibly is, a younger architect, and deserving therefore not ridicule, but kind counsel, is content to jeer rather than guide, and apparently to assume that there can be but one standpoint from which the things of even architectural draughtsmanship may be discerned.—Yours truly, M.

To the Editor of The Builders' Journal.

Kirkcaldy.

Dear Sir,—I was more amused at Mr. Mackintosh's sketch of Queen Margaret College, Glasgow, which appeared in the issue of "Building News" for November 22nd, 1895, than at the one illustrated on page 108 of your issue for September 20th, both of which however are to say the least extraordinary. Perhaps Mr. Chatterton and H. T. B., whose letters appear on pages 133 and 134 of No. ccxliii, may have a look at the sketch I refer to and give us the further benefit of their humourous criticism.

I may say that after hearing that Mr. Macintosh's sketch was publicly exhibited—I think at the R.S.A.—I felt hopelessly "gone wrong." These sketches would seem contemporary with the time of Albert Dürer.—Yours, etc.,

D. FORBES SMITH, A.R.I.B.A.

BUILDING BYE-LAWS IN RURAL DISTRICTS.

To the Editor of The Builders' Journal.

New Malden.

Sir,—In your issue for October 4th you drew attention to some concessions granted by the Local Government Board with reference to this matter. At the present time there is a widespread and growing feeling that the Model Bye-laws should be very largely amended, especially in relation to rural districts; but I must protest against the suggestion, supported by your remarks, that they should permit the erection of wooden cottages. This, I am sure, is a step backward instead of forward in the march to sanitary perfection.

My experience is that the cost of keeping a timber framed cottage in thorough repair after it has been erected, say twelve years, is much greater than is usually thought, and is a matter of grave importance to landowners. Although a wooden cottage is a trifle cheaper to build, in a short time it is liable to get into a very insanitary condition, and as rural authorities seldom enforce what power they have to remedy this, it is necessary to discourage as much as possible the erection of buildings which may become a serious danger to the public health. I am convinced that the only really satisfactory method of building cottages is to use the best materials, and in a substantial manner, which reduces the annual cost of repairs to a minimum. Bye-laws such as No. 25, relating to parapet walls, and Nos. 26 and 27, dealing with party walls are quite unnecessary in rural districts, and if insisted upon are the cause of very heavy expense.—Yours faithfully,

GEORGE H. SMITH, P.A.S.I.

[We are pleased to publish the above letter, although we cannot entirely endorse the argument. We shall be glad to hear the opinions of other readers on this important subject, and for the present defer further comments of our own.—Ed.]

New Law Courts at Leeds are proposed to be built.

The Glasgow School of Art has taken new premises at 167, Renfrew Street.

Brechin Cathedral is to be restored at a cost of £9,500 from designs by Mr. Honeyman, R.S.A., Glasgow.

A New Wing to the Ipswich and East Suffolk Hospital, called the Victoria wing, has just been completed. Mr. E. F. Bishopp was the architect.

New City Offices at 15, New Broad Street, E.C., have been opened by Mr. H. Brooks Leigh, architect, surveyor, &c., of 297, Amhurst Road, Stoke Newington, N.

New Engineering Works at Darlington.—Messrs. Robert Stephenson and Co., Ltd., of Newcastle-on-Tyne, have decided to erect engineering works on the site formerly occupied by the Darlington Iron and Steel Co., Ltd., at Springfield.

An Unfortunate Erection.—There has recently been constructed at Bedworth a water tower, the cost of which ran into four figures. But the well won't work, and water is being carried in carts by the North East Warwickshire Waterworks Company. Verb sap.

Professional Practice.

Ayr.—At the last meeting of the Ayr Town Council an account for £47 5s. was submitted from Mr. H. J. Blanc, architect, Edinburgh. The account consisted of £31 10s., fee for plans and report on sites for the new town hall, and £15 15s., fee for supplementary plans and report. The Finance Committee had recommended payment of the £31 10s. only. In moving the adoption of the minute, Mr. Lamb said it had been distinctly laid down before he had been employed that Mr. Blanc was to receive thirty guineas for his services. If Mr. Blanc had prepared a second report, he had done so on his own responsibility, and not on the instructions of the Council. Mr. J. B. Fergusson understood that Mr. Blanc had been instructed by the members of the committee to make this supplementary report. Dean of Guild Morton thought it was a proper course to refuse to pay more than thirty guineas. Mr. Craig said that as a member of the committee he wanted to clear himself; he had not been aware of the instruction. He thought that if the members of the committee present gave the instruction they ought to pay the extra charge, and he declined to be responsible. Provost Templeton said he was one of the four members of committee who had met Mr. Blanc on September 17th last year, and it had then been pointed out to Mr. Blanc that he might have to draw up another report with relative sketches, and Mr. Blanc had agreed to do so. Dean of Guild Morton asked where the instructions came in. Provost Templeton said Mr. Blanc had no orders further than that. The Town Clerk explained that Mr. Blanc had written to him stating that he would like to meet the members of the committee. Some members denied having received any notification of the meeting. On the day Mr. Blanc arrived Mr. Fergusson called at the Town Clerk's office, and there learned that no arrangement had been made for the committee to meet him, the only instruction given being that when Mr. Blanc arrived a message was to be sent to the members of the committee. He certainly had no hesitation in saying that Mr. Blanc had been instructed. If the four members of the committee had done wrong, by all means let them be made to pay the sum due, but it seemed to him to be a very miserable thing to try to reject Mr. Blanc's charges. Bailie Grant said that if the Council had incurred a legal debt they were bound to pay it, no matter who was eventually responsible. Bailie Smith said the Council were not legally responsible, and if anyone had taken it upon himself to represent or misrepresent the Council in incurring debt, it was he and not the Council who should pay for it. Mr. Fergusson moved the disapproval of the minute in so far as it referred to the refusal to pay the whole of Mr. Blanc's account. On the division this was objected to by thirteen votes to five—which means that Mr. Blanc receives £31 10s. only.

Birmingham.—A new permanent circus has been built in Hurst Street from designs by Mr. F. W. Lloyd. To avoid the nuisance of waiting outside for admission, there is a main corridor 288ft. long, into which the audience will be admitted at once. The roof of the building is in one clear span from wall to wall, and consists of eight iron truss principals; it is plastered in adamant and decorated in duresco. The building is 115ft. long, 94ft. wide, and 50ft. high, while the ring is 42ft. in diameter. Accommodation is provided for 4,000 people. The decorations have been carried out by Messrs. Horton and Son. The walls are of deep Indian pink, and the front of the gallery is executed in rich plaster work, decorated in white and gold. The decorative work on the ceiling is well designed, and produces a most pleasing effect. The house and corridor are brilliantly illuminated with the electric light.

Manchester.—The John Rylands Library, which has just been opened, is on a site facing Deansgate, and is bounded on the north, east, and south-west by Wood Street and Spinning Field, both narrow streets containing buildings of considerable height. With a view to obtaining adequate light for the library itself, and to secure quietness, the library is placed on the upper floor, and is set back some 10ft. from the building line. The main entrance is from Deansgate, and the whole of the front is occupied by a spacious vaulted vestibule, above which are the librarian's rooms. A short flight of wide steps leads up to the centre of the vestibule, parting towards the left and right landing on the ground-floor level, and giving access to the cloistered corridors whence all the first-floor rooms are reached. Facing this approach is an allegorical group representing Religion, Science, and Art, executed by Mr. Cassidy. From the vestibule level stairs on each side lead down to lavatories in the basement, and from the landing on the ground-floor level a wide staircase leads to the first floor, giving immediate access to the librarian's rooms and to the main library. The staircase which occupies one of the towers passes into a vestibule in the library proper, and the vaulted ceiling is about 52ft. from the first floor. The library consists of a central corridor about 20ft. wide and 125ft. long, ending in an apse at the further end, which gives an extreme length in all of about 148ft. It is 44ft. from the floor to the top of the vaulted ceiling, and is groined throughout in stone. It is divided into eight bays, one of which is occupied by the main entrance, while the rest open into reading recesses, giving on this floor fifteen recesses, occupied by bookcases. The end bay on either side projects so as to form a sort of transept for the building. The style of the building is Gothic of the fourteenth century. The building is almost entirely vaulted in stone, but where this has not been admissible fireproof construction is used after Messrs. Hanan and Royers' system, the main floors being of a double thickness of fireproof with space between. The material used is mainly stone from quarries in the neighbourhood of Penrith. That used for the interior is Shawk, a stone varying in colour from delicate red to grey; that for the exterior is Barbary plain stone, which has a uniform tint of a darker red. The bookcases have been executed by Messrs. Clements Jeakes, of Bloomsbury Street, London. Nearly all the sculpture, both figures and floral, has been done by Mr. Bridgeman, of Lichfield. The heating is by batteries of hot-water pipes, through which air is passed after filtration through screens from the exterior. The electric lighting has been executed by Mr. Thomas, under the supervision of Mr. Charles Hopkinson as consulting engineer. The electric fittings are by Messrs. Singer, of Frome, Somerset, as are also the coil-cases and much of the other metal work. The plaster modelling is by Mr. George Frampton, A.R.A. Messrs. Morrison, of Liverpool, have carried out the entire work, except the foundations, and Mr. Stephen Kemp has been clerk of works. Mr. Basil Champneys is the architect, and nine years have elapsed since this great Gothic building was first begun.

Sheffield.—On Monday last week the Duke of Devonshire opened the new Pupil Teachers' Centre building, which has been erected in Holly Street. The style adopted for the building is a treatment of Flemish Renaissance. The front of the building is treated with rock-faced Dunford Bridge stone, with Ashlar dressings. In the centre of the front in Holly Street is the main doorway of the building, flanked by mullioned and transomed windows lighting the entrance hall, the composition being finished with a carved stone cornice, with a central pediment bearing on a shield the monogram of the School Board. The porch is formed of moulded pitch pine framing, relieved with columns, &c. There is a dado of glazed bricks, and the upper portion of the walls and the ceiling are panelled in pitch pine. Over the inner door is a large carved composition, introducing the arms of the Board. The windows are filled with leaded lights, and cathedral-tinted glass. On the ground floor there are three class rooms, which, being divided by movable partitions, may be converted at once into a hall 57ft. long by 25ft. wide, for joint classes or lectures. The second floor is arranged similarly to the first, and is approached by two stone staircases. The interior of the building is finished in the usual Board School manner, with white glazed brick linings to the staircases and hall, and cement dadoes to the rooms. All the woodwork is of varnished pitch pine. Burlington desks are provided for the art room, and desks specially designed by the headmaster, Mr. Arnold, have been fixed in the other rooms. Mr. Herbert W. Lockwood, of Sheffield, is the architect, and Mr. James Fidler, Sheffield and Eckington, is the contractor. Mr. Frank Tory has executed the carving, and the ventilating and warming apparatus has been fixed by Mr. William Key, of London and Glasgow.

York.—The children's ward which has been added to the York County Hospital was opened recently, and up to the present time has cost £41,024. Messrs. Demaine and Brierley were the architects for the additions. The new ward is on the south side of the main building, and is approached from the ground floor of the corridor which connects it with another wing. It comprises a ward 70ft. long by 24ft. wide, providing accommodation for eighteen cots, an isolated ward for three cots, a large day room, a ward kitchen, a very convenient sun verandah, and, at the south end, separate bath and lavatory accommodation. The floors of the wards and of the day rooms are laid with polished Indian teak blocks, and all the walls are tiled to the height of 5ft. with grey glazed tiles. Hot water pipes supply the required heat, but there are in addition large central stoves. The building is raised 5ft. from the ground on arches so as to lift it above any damp that may arise from the soil; it is one storey high, and is furnished with a flat concrete and asphalted roof, so that a second storey may be added when required. The erection of the new ward necessitated the removal of the old mortuary, which was very inconveniently situated and arranged, and quite inadequate. A new block has been built at the east end of the main building, comprising a laboratory, post-mortem room, and mortuary.

Professor Goodman on American Engineers.—At the recent opening of the winter session of the Yorkshire College Engineering Department, Professor Goodman, who has just returned from a tour in the United States, gave his views on American engineers and engineering. The Americans, he said, were rapidly remedying the rough and slipshod manner of executing work in their shops. Everything was becoming more solid and stable, and the country was now seriously beginning to compete with us, particularly in the production of iron and steel. Whilst in 1895 we imported only fifty-nine tons of steel from America, during 1897 we received 26,000 tons. The American manufacturer invested his savings in increasing and improving his plant. He put down machinery only to last a few years, assuming that at the end of that time better machinery would be produced, and believing that it was cheaper to throw out machinery from time to time, and get better, than to spend a large sum of money on machinery that would last. Although wages were 50 per cent. higher in the States than in England, the American workman turned out more than 50 per cent. more work. He did not object to work four or five machines. The average American workman held a higher social position than the Englishman; he was better educated, and better treated by his employers. Gambling and drunkenness were almost unknown amongst better-class American workmen. American locomotives, though roughly finished, and though they did not stand the wear and tear of English-made engines, were more powerful, having bigger boilers. Steel freight cars were largely used on American railroads. They carried three times their own weight, whereas wooden ones were only capable of carrying about twice their own weight. Professor Goodman admitted that in public works the Americans were still far behind us.

New Companies.

Worcester Glue, Size, and Gelatine Manufacturing Company, Limited.

This company was registered on September 20th by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £5,000 in £1 shares, to acquire the business of glue, &c., manufacturers as now carried on by James Gibbs, at Twybridge Street, Worcester, with title as above, but not as a limited company ; to adopt an agreement (dated Aug. 29th) made between James Gibbs of the first part, H. C. Thomas of the second part, and E. J. Byrne of the third part, and to develop and extend the said business in all its branches.

West Suburban Estates, Limited.

This company was registered on September 27th by Ward, Bowie and Co., 7, King Street Cheapside, E.C., with a capital of £10,000 in £10 shares, to acquire and deal with any land or interest in land and buildings, and to erec and maintain buildings, factories, warehouses &c. The first directors (to number not les than five nor more than ten) are to be appointec by the subscribers. Qualification, ten shares

Stanley Paint Manufacturing Company Limited.

This company was registered on Septembe 27th by Jordan and Sons, Limited, 12C Chancery Lane, London, W.C., with a capita of £15,000 in £1 shares, to acquire an inven tion for a solution for mixing paint, to adop an agreement with R. A. Parkin and G. G Dickenson, and to carry on the business c paint, oil, and colour manufacturers, &c. Th first directors (to number not less than thre nor more than five) are R. A. Parkin, G. G Dickenson, W. Hawley, T. R. Robertson, an T. J. Fletcher. Remuneration as fixed by th company.

William Sharp and Co., Limited.

This company was registered on Septen ber 28th by Janson and Co., 31, Finsbur Circus, E.C., with a capital of £4,500 in £ shares, to adopt two agreements with W. I H. Winton and J. Keen respectively, and t carry on the business of brick, pottery, til and plaster manufacturers and merchant The first directors (to number not less tha two nor more than five) are W. H. H. Winto and W. Sharp (permanent directors). Qual fication of ordinary directors, 150 shares.

Banner and Co., Limited.

This company was registered on Septen ber 28th by Maud and Tunnicliffe, Arund House, Arundel Street, W.C., with a capital £5,000 in £1 shares, to acquire the busine carried on by A. Banner, T. Pennington a H. Southerd, at Cobridge, Burslem, under t style or firm of Banner and Co., and to car on the business of and dealers in sanita earthenware, &c. The first directors (number not less than three nor more th four) are A. Banner, H. Southerd, H. Garlic and J. Draycott. Qualification, 500 shar Remuneration as fixed by the company.

Hinckley Wharf Brick, Tile, and Pottery Company, Limited,

This company was registered on Septeml 30th by Crosley and Burn, 2, Moorgate Str Buildings, E.C., with a capital of £10,00 in £5 shares, to acquire the Hinckley Wh Brick Works, at Hinckley, Leicestershire, a to carry on the business of brick and makers, stone and coal merchants, &c. T first directors (to number not less than nor more than five) are B. Ryley and E. Pr Qualification, fifty shares. Remuneratior fixed by the company. Registered of Hinckley, Leicester.

Buttington Bricks, Tile, and Terra-Cotta Works, Limited.

This company was registered on October 2nd by Waterlow Brothers and Layton, Limited, Birchin Lane, E.C., with a capital of £10,000 in £1 shares, to acquire the business carried on by H. H. Treasure at Buttington, Montgomery, and to manufacture and deal in bricks, tiles, pipes, pottery, &c. The first directors (to number not less than three nor more than seven) are to be appointed by the subscribers. Qualification, 100 shares. Remuneration as fixed by the company.

William Henry Assenter and Co., Limited.

This company was registered on October 2nd by A. Pope, Grecian Chambers, Devereux Court, Temple, E.C., with a capital of £1,000 in £1 shares (35 founders'), to acquire the business carried on at 2, Vestris Road, Forest Hill, as William Henry Assender and Co., to carry on the business of lime burners, gravel, lime, and cement merchants, and manufacturers of lime cylinders. The first directors (to number not less than three nor more than five) are W. H. Assender, W. Beam, and A. Pope. Qualification, £50 ordinary shares, or £10 founders' shares. Registered office: 2, Vestris Road, Forest Hill.

Burstall and Co., Limited.

This company was registered on October 3rd by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £20,000 in £1 shares, to acquire the business carried on at Kingston-upon-Hull by James N. Burstall and George A. Lambert under the style or firm of Burstall and Co., to adopt an agreement with John Smith, and to carry on the business of cement manufacturers, brick and tile makers, &c. The first directors (to number not less than three nor more than five) are E. Robson (chairman), J. W. Burstall, and G. Lambert. Qualification, £200. Remuneration as fixed by the company. Registered office: Kingston Cement Works, Stoneferry, Hull.

Colwick Brick and Tile Company, Ltd.

This company was registered on October 9th by E. Cox and Sons, 102, Chancery Lane, W.C., with a capital of £7,000 in £1 shares, to acquire certain land situated at Colwick, Staffordshire, and to carry on the general business of brick, tile, and terra-cotta makers, stoneware manufacturers, &c.; to get and make marketable clay, marl, brick earth, sand, &c.; and to erect suitable buildings for the carrying on of the said businesses. Registered without articles of association.

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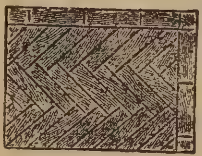

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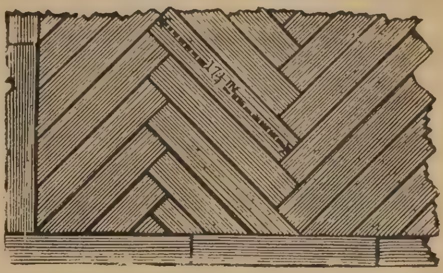

Per 100 Blocks out of sizes.	YELLOW.		PITCH PINE
	At Wharf.	ex Ship within one month.	At Wharf.
17¼ × 3 × 3	12 7	11 4	19 2
17¼ × 3 × 2	8 10	8 1	13 0
17¼ × 3 × 1½	6 9	6 2	10 6

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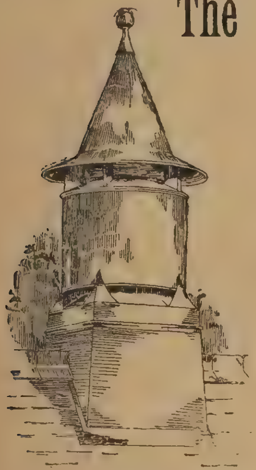

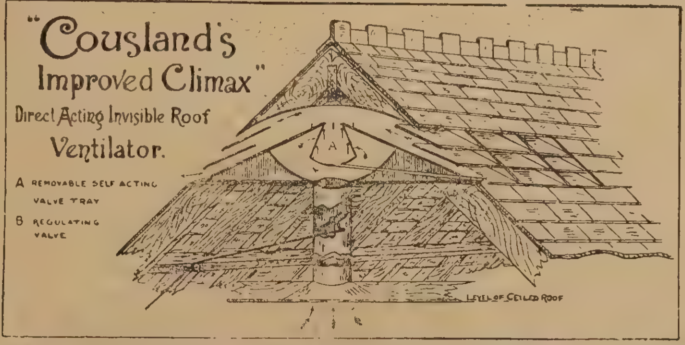

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CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 4 0
Sainfoin mixture	do.	3 15 0	4 7 6
Clover, best	do.	4 0 0	5 0 0
Beans	per qr.	1 8 6	1 8 9
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS

Castor Oil, French ...	per cwt.	1 3 4	1 7 5
Colza Oil, English ...	per cwt.	1 5 9	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 9 0	—
Linseed Oil	per cwt.	1 3 9	—
Petroleum, American ...	per gal.	0 0 7	—
Do., Russian ...	per gal.	0 0 5 7/16	— 5 5/8
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 6 0	1 8 0
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 17 10½	—
Glue	per cwt.	1 14 0	2 18 0
Lead, white, ground, carbonate	per cwt.	1 2 0	1 3 0
Do. red	per cwt.	0 19 1½	—
Soda crystals	per ton	3 0 0	—
Shellac, orange	per cwt.	3 2 0	3 0

METALS.

Copper, sheet, strong ...	per ton	88 0 0	—
Iron, bar, Staffs. in London	do.	9 0 0	10 0 0
Do. Galvanised Corrugated sheet ...	do.	13 15 0	14 0 0
Lead, pig, Spanish ...	do.	16 10 0	—
Do. do. English common brands	do.	16 15 0	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	18 0 0	18 2 6
Do. pipe	do.	19 0 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	do.	9 15 0	10 15 0
Tin, Foreign	do.	146 0 0	146 10 0
Do. English ingots ...	do.	149 0 0	150 0 0
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	29 10 0	—
Do. Spelter	do.	22 12 6	22 5

TIMBER.

Soft Woods.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Do. Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	do.	4 0 0	6 10 0
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd.	do.	12 10 0	12 15 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	10 10 0	16 0 0
Do. do. 2nd „	do.	10 10 0	12 0 0
Do. do. Unsorted „	do.	10 0 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	9 0 0	16 15 0
Do. White Sea	do.	12 15 0	13 0 0
Do. Quebec Pine, 1st...	do.	20 0 0	23 15 0
Do. do. 2nd	do.	13 15 0	15 15 0
Do. do. 3rd &c.	do.	7 15 0	9 15 0
Do. Canadian Spruce, 1st	per P. Std.	9 0 0	10 5 0
Do. do. 3rd & 2nd	do.	6 5 0	7 15 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	7 5 0	9 10 0
Flooring Boards, 1 in. prepared, 1st	per square	0 11 0	—
Do. 2nd...	do.	0 10 6	—
Do 3rd &c.	do.	0 8 0	0 8 9

Hard Woods.

Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4	—
Do. Honduras	do.	0 0 5 7/32	—
Do. Tobasco	do.	0 0 4 23/32	—
Elm, Quebec	per load	4 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 13/16	—
Do. African ...	do.	0 0 5 7/32	—
Do. St. Domingo ...	do.	0 0 6 25/32	—
Do. Tobasco ...	do.	0 0 5 7/32	—6 19/32
Oak, Dantzic and Memel	per load	3 0 0	8 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	7 10 0	17 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ..	per cub. ft.	0 2 1	0 3 6

COMING EVENTS.

Wednesday, October 18.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—(1) Inspection and Demonstration of Disinfecting Apparatus and Model Steam Laundry at St. John's Wharf, Fulham, at 3.30 p.m., conducted by Mr. W. G. Lacy. (2) "Calculations, Measurements, and Plans and Sections."

Builders' Foremen and Clerks of Works' Institution.—Quarterly meeting of the members. 8 p.m.

Thursday, October 19.

Carpenters' Hall, London Wall (Lectures on Sanitary Building Construction).—Professor Henry Robinson on "Sanitary Requirements." 7.30 p.m.

The Institution of Sanitary Engineers (Incorporated).—The ordinary monthly sessional meeting. 8 p.m.

Friday, October 20.

The Architectural Association.—Conversazione, to be held at King's Hall, Holborn Restaurant. 8 p.m.

Sanitary Institute.—(Lectures for Sanitary Officers.)—Dr. Joseph Priestley on "Ventilation, Warming, and Lighting." 8 p.m.

Institution of Junior Engineers.—Annual general meeting at the Westminster Palace Hotel. Election of officers for nineteenth session, Council's report, &c. 8 p.m.

Saturday, October 21.

Sanitary Institute.—(Demonstrations for Sanitary Officers.)—Inspection at the Southwark and Vauxhall Waterworks, Hampton. 3 p.m.

Monday, October 23.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers).—Louis Parkes, M.D., D.P.H., on "Water Supply, Drinking Water, Pollution of Water." 8 p.m.

Wednesday, October 25.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and demonstration at East London Soap Works, Bow, E. 3 p.m. H. D. Searles Wood, F.R.I.B.A., on "Building Materials." 8 p.m.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

AYR.—For the execution of waterworks, Fairlie, for the Ayrshire County Council. Mr. P. Campbell Hart, C.E., Kilmarnock:—

Construction of Reservoir, Clear Water Tank, Pipe-laying, &c.

Craik and Tuckwell, Glasgow	£3,621 4 11

Valves and Fittings.

Glenfield Company, Limited...	£118 14 11

Filtering Apparatus.

Reeves Patent Filters Company, London	£260 0 0

Eight firms tendered, highest £4,684 2 2

CROYDON.—For the erection of schools for 1,220 children, with three central halls, and caretaker's house, Ecclesbourne-road, Thornton Heath, for the School Board. Mr. H. Carter Pegg, architect, Thornton Heath:—

Spencer, Santo, & Co.	£18,578	Smith and Sons... ...	£16,195
Falkner and Sons ...	17,833	Ross and Sons, Ltd....	16,130
Smett and Steel... ...	17,172	Smith and Son, Croydon (accepted)... ...	15,534
E. J. Saunders	17,000		

ERITH (Kent).—For the erection of school buildings West-street, for Erith School Board, Erith, Kent. Mr. W'

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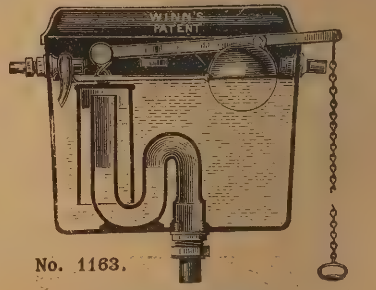

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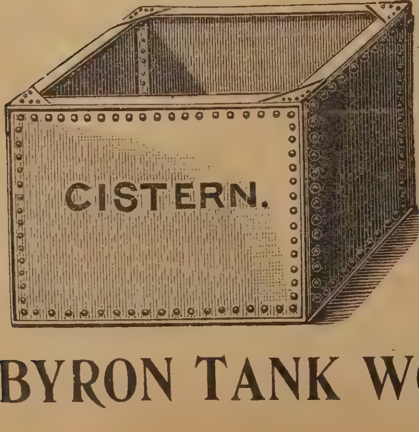

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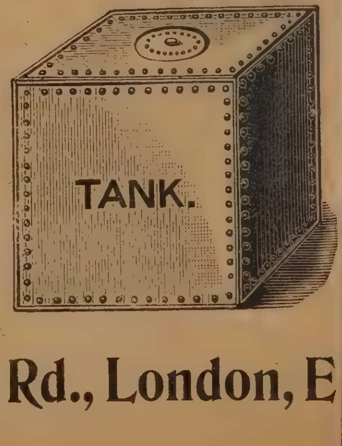

Egerton, architect, 12, Queen's-road, Erith. Quantities by architect :—

G. H. Cumming... ...	£13,469
Thomas and Edge ...	13,276
Enness Bros.	11,994
Martin, Wells, & Co.	£11,695
T. G. Sharpington ...	11,300

HASTINGS.—For the erection of stabling, loose boxes, &c., Rock-a-Nore, for the Corporation. Mr. P. H. Palmer, C.E., Town Hall, Hastings :—

Tapner and Woodman, Hastings	£1,368

LONDON.—For the erection of a warehouse, stables, &c., at Tyer's Gateway, Bermondsey, for Messrs. Forge and Hatton. Messrs. John M. Klenck and Co., surveyors, 64, Bishopsgate-street Within, E.C. :—

Lidstone and Sons ...	£2,661
George Parker	2,649
F. and H. F. Higgs ...	2,636
John Greenwood ...	£2,621
Ashby Bros. (accepted)	2,506

READING.—For the erection of synagogue and minister's house for the Reading Hebrew Congregation. Mr. Lewton, architect, 6, Forbury, Reading. Quantities by Messrs. H. Cooper and Sons, Reading :—

W. Stokes	£3,843 11 9
McCarthy Fitt ...	3,769 0 0
W Hawkins ...	3,760 0 0
R. Curtis	3,750 0 0
G. Tucker	£3,747 0 0
F. Newberry ...	3,412 17 6
G. Dixon (late)...	3,025 0 0

[All of Reading.]

SHADWELL COURT (near Thetford, Norfolk.)—For alterations and additions to The Mansion. Herbert J. Green, architect and surveyor, 31, Castle Meadow, Norwich :—

S. J. Waring and Sons	£13,743 18 5
J. Youngs and Son	11,956 0 0
Gillow and Co.*	£11,109 8 1
J. Shillitoe and Sons	10,891 18 9

* Conditionally accepted.

SKIBO (N.B.).—For the execution of embankment works, bridges, &c., for Mr. A. Carnegie. Mr. Manners, C.E., 12, Lombard-street, Inverness :—

Matheson & Co.	£22,147 18 6
Chisholm & Co.	15,222 13 0
T. Peattie	14,403 17 7
J. Ross	14,204 2 0
W. Macpherson	13,643 10 8
J. Ross	13,288 10 0
A. Pirie	13,202 5 6
C. Mackay	£13,201 14 9
G. Simpson ...	12,967 1 6
A. Cameron ...	12,638 14 8
T. Macdonald ..	12,597 0 2
R. Fraser, Inverness*	11,263 3 2
Brebner and Co.	9,156 17 7

* Accepted.

CONTRACTS OPEN.

ENFIELD SCHOOL BOARD.

TO BUILDERS AND CONTRACTORS.

The Enfield School Board invite TENDERS for the ERECTION of a GIRLS' DEPARTMENT and New ASSEMBLY HALL, with Alterations to existing Building, at the Alma-road School, Ponder's End.

Applications for bills of quantities should be sent to the Architect, Mr. G. E. T. LAURENCE, 181, Queen Victoria-street, London, E.C., before OCTOBER 21st, after which date the plans and specification can be seen at the above-named address. A deposit of One Guinea should accompany the application, to be returned on receipt of a bonâ-fide Tender.

Sealed Tenders, on the form supplied, must b delivered at my Office, free of charge, not later than TWELVE noon, on TUESDAY, NOVEMBER, 7th, 1899.

Persons Tendering will be required to sign an undertaking to pay the rate of wages and observe the rules adopted by the London Building Trades Federation, and to find two sureties in £500 each for the due performance of the contract.

The Board do not bind themselves to accept the lowest or any Tender.

By order,
N. HEPWORTH,
Clerk.

School Board Offices,
Court House,
Enfield,
October 4th, 1899.

NOTICE.

WARBLINGTON URBAN DISTRICT COUNCIL.

TO BUILDERS, CONTRACTORS, AND OTHERS.

TENDERS are invited by the above-mentioned Council for the ERECTION of PUBLIC OFFICES, COTTAGE, STABLES, and other works connected therewith, at Emsworth, in the County of Southampton, according to the plans and specifications prepared by Mr. FRANK SWINBURNE (the Council's Architect and Surveyor), and subject to conditions which can be seen at the Surveyor's Office, in West-street, Emsworth, aforesaid, between TEN a.m. and FOUR p.m. (on Saturdays between TEN a.m. and ONE p.m.).

The contractor whose Tender may be accepted will be required to enter into a contract to execute the works and to observe the conditions, and he will be required to provide satisfactory security for the due performance and observance of the contract.

The security offered must be mentioned in the Tender.

Tenders, endorsed "Public Offices," to be delivered at my Office on or before the 28th day of OCTOBER next.

The Council does not bind itself to accept the lowest or any Tender.

By order,
J. W. LOADER COOPER,
Clerk to the Council.

Queen-street, Emsworth,
October 5th, 1899.

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TO BUILDERS and CONTRACTORS.

The Brading School Board invite TENDERS for the ERECTION of a Higher Grade BOARD SCHOOL on a site near the Railway Station, Sandown.

Plans and specification can be seen at the Offices of Mr. JAMES NEWMAN, Architect, Thornton, Sandown, from whom all further particulars can be obtained. Tenders to be sent in on or before NOON, on TUESDAY, OCTOBER 31st next, to the undersigned.

The Board do not bind themselves to accept the lowest or any Tender.

HARRY C. GRAPES,
Clerk to the Brading School Board.

Sandown, I. of W.
October 4th, 1899.

CITY and COUNTY BOROUGH of CANTERBURY.

NEW LUNATIC ASYLUM.

CONTRACT No. 1.

Builders desirous of TENDERING for the ERECTION of NEW BUILDINGS, forming part of the proposed Asylum for the Canterbury Town Council, may see the drawings and specifications at the Office of the undersigned, where they may also obtain copies of the bills of quantities on depositing the sum of £10, which will be returned on the receipt of a bonâ-fide Tender.

Tenders, on the form provided, are to be sent to the Chairman of the Committee of Visitors not later than TEN o'clock on the morning of the 26th inst.

No pledge is given to accept the lowest or any Tender.

W. J. JENNINGS,
Architect.

No. 4, St. Margaret's-street,
Canterbury,
October, 1899.

TO BUILDERS.

The Commissioners of H.M. Works and Public Buildings are prepared to receive TENDERS for RETAINING WALLS and FOUNDATIONS for the proposed new WAR OFFICE, Whitehall.

Drawings, specifications, and a copy of the conditions and form of contract may be seen on application to SIR JOHN TAYLOR at the Office of Works.

Bills of quantities have been prepared for the use of Builders by Messrs. WELCH and ATKINSON, of 10, Lancaster-place, Strand, and Mr. W. H. STRUDWICK, of 41, Wych-street, Strand, and, together with forms of Tender, may be obtained at the undermentioned Office on payment of One Guinea. The sums paid will be returned to those persons who send in Tenders in conformity with the conditions specified below.

The Commissioners do not hold themselves responsible for the accuracy of the quantities, nor do they bind themselves to accept the lowest or any Tender.

Tenders are to be delivered before TWELVE o'clock noon, on FRIDAY, the 27th inst., addressed to the Secretary, H.M. Office of Works, &c., Storey's-gate, London, S.W., and endorsed "Tender for Foundations, &c., New War Office."

H.M. Office of Works, &c.,
October 4th, 1899.

BOROUGH of ROYAL LEAMINGTON SPA.

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TO BUILDERS.

Persons wishful to TENDER for the ERECTION of the above are requested to send their names and addresses to Mr. J. MITCHELL BOTTOMLEY, Architect, 13, Bond-street, Leeds, on or before MONDAY, the 23rd inst., in order to be supplied with the necessary particulars.

H. CONSETT PASSMAN.
Town Hall, Leamington. Clerk.
October, 1899.

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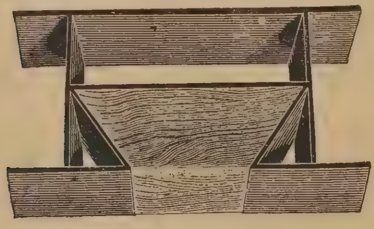

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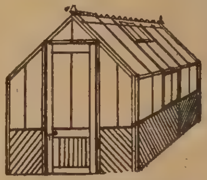

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THE NEW PARIS WATER SUPPLY FROM LAKE GENEVA.

By EDWARD CONNER.

CITIZENS and engineers are occupied with the periodical shortages in the supply of drinking water for Paris, and are seeking a scheme which will permanently remove the long-standing evil and save the frequent tappings of the small rivers situated within the water-shed of the capital, as well as avoid the constant laying of fresh pipes and the construction of new reservoirs. These stop-gap plans are only at best but mere instalments of a definite solution; they are very dear, and, in a word, unpractical. For the last seven years Engineer Duvillard has been advocating the taking of water from the Lake of Geneva at a spot called Hermance and conveying it in the usual way to the proposed reservoirs at Clamart, a suburb of Paris. The distance from the lake to the reservoirs is 317 miles. The fall during the flow would start from an initial height of 406yds. and descend to a level of 110yds. The cost of the work is estimated at 450 millions of francs, or eighteen millions sterling, and though the scheme is a costly one it is accepted as being a necessity for the welfare and good health of the inhabitants of Paris.

The Lake of Geneva, or Leman, is the largest and deepest lake in Eastern Europe. In shape it resembles a graceful crescent. It is surrounded by the cantons of Valais, Vaud, and Geneva; on the southern side by Savoy, and on the west by the Alps, with a land-point protruding into the Jura. France owns about one-fourth of the basin, which empties its waters into the lake, as well as one-third of the superficies of the latter, and thirty-three miles of the lake shore. The greatest length of the lake is fifty-six miles, and its greatest width four and a half miles. It is 1,218ft. above the level of the sea, and its depth, which has been the object of several interesting experiments, is generally fixed at 328 yards between Vevey and Meillière, and at 82 yards at Geneva, where the lake in a narrow spot at Nyon takes the name of Geneva, or the Little Lake. Its navigation is not without danger; storms are both sudden and violent, and there are bad currents; while good sized waves are often seen. Occasionally the water suddenly wells or lumps up to a height of nearly two yards, falling as rapidly; this is attributable to the unequal sectional pressure of the atmosphere. Mirages are not uncommon, so is the appearance of the "Fata Morgana," the Italian fairy of the lake.

Though Lake Geneva is subject to redoubtable tempests and formidable waves, it has no tides. It has been calculated that were all the rivers that flow into the lake to suddenly stop it would require ten years for the lake to empty itself dry into the ocean. The French decline to listen to any proposition from the Swiss engineers with regard to the utilisation of the waters of Lake Neufchâtel as a substitute. This lake is situated entirely in Swiss territory, and its waters flow directly into the Rhine. The waters of Lake Geneva are chiefly composed of melted snows and icebergs from Savoy, and pass out by the Rhone Estuary, which is a French river, while the shore of the western extremity of the lake is also French; this is precisely the point where it is proposed to lay down the necessary piping to convey the water to Paris.

The project has been examined by both the French Government and the Municipality, and is claimed to be the definite solution of the city water question. It will yield pure and fresh water at all heights, for all purposes, and to all persons. The director of the municipal waterworks fixes the amount of water that would be allotted to each inhabitant at 72 gallons a day. The population of Paris is now two and a half millions, and by the year 1930 it is calculated to increase to 3,400,000. The suburbs by that time will have a population of 800,000 individuals. For a population then, say, of five millions, at the rate of 72 gallons daily per head, as much as 1,815,000 cubic yards of water will be required. Of course, less than this will be needed when the season is cold and wet, but 30 per cent. more during the summer. The "special" potable water at present distributed in Paris costs the city 11 to 12 centimes (or a fraction over a penny) per cubic metre. The water of the Seine, all expenses included, costs between six and seven centimes (a fraction over one half-penny) for canals, factories, and matériel. To this must be added two more centimes (five centimes equal ½d.) to defray the cost of raising the water to the required altitude for pressure in certain parts of the metropolis. The new Geneva supply will naturally abolish this outlay, and will thus represent an economy for "subscribers." Scientists agree that the water in the Lake of Geneva is the purest and healthiest in Europe. There will be no necessity to filter it on its arrival in Paris. As already remarked, it is produced from the melting of the snow and ice during the great heat in summer; the Seine and Loire rivers owe their supply to rains, that decrease as summer approaches. As soon as the new supply from the Lake of Geneva comes into operation there will be less low water intervals in the Seine, and plenty of water left for flushing the sewers now so abominably dry and repulsive during the hot summer months.

M. Lèon Massol, director of the laboratory of bacteriology at Geneva, has made no fewer than 1,338 examinations of the water of the Lake of Geneva, and he concludes by stating that it cannot be surpassed for hygienic excellence. Messrs. Fol and Durrant have found the number of living germs or microbes in this water to be only 38 per cubic centimètre; in the case of the Paris waters, the Vanne, for instance, which is considered the best of its kind, contains 1,250 microbes per cubic centimètre, the Avre water contains 2,886, and the Dhuis water 3,825 for the same quantity. The following table shows the official analysis of one litre (1¾ pints) of water taken at the surface of the Lake of Geneva:—

Gases, per cubic centimètre:—	
Oxygen	6·85
Nitrogen	14·96
Carbonic Acid	2·85
Solid matters, in milligrammes:—	
Chloride of Sodium and Potassium	1·8
Sulphate of Sodium	15·
Sulphate of Ammonia	traces
Sulphate of Lime	47 9
Carbonate of lime	73·9
Nitrate do. do.	1·
Carbonate of Magnesia	17·
Silica	3·7
Alumina and oxide of iron	1·9
Organic matter and loss	11·9
Total	198·76

The pipe waters of Paris contain from 240 to 288 milligrammes of mineral matters per litre, and from 40 to 59 of gaseous or volatile elements.

The Lake of Geneva is fed by twenty rivers or streams that bring the water from a basin of 8,000 square metres, 1,100 of which are covered over with icebergs or perpetual snows. The difficulties of the project arise in connection with the navigation of the French Rhône, which is the discharge river of the lake. In 1883, the City of Geneva, in the name of the lake-side cantons, regulated the height of the waters. In its natural or wild state, the level of the lake varied 2⅘ metres between high and low extremes. Works were undertaken in the form of dams, so that since 1890 the variation does not exceed ⅗ of a metre (say 2ft.). But the outflow during the period of the melting of the snow is greater than hitherto. Thus, the volume of water that did not formerly exceed 560 cubic metres per second is now 700 cubic metres; the result of such an excess is to augment floods and cause greater interruption of navigation on the Rhône. It is apprehended that by taking water from the Lake of Geneva the navigable conditions of the Rhône will undergo an alteration.

During eleven months in the year navigation on this river is normal pending fourteen days, it is completely unnavigable on account of floods and ice; while during fourteen other days transport on the river is attended with serious difficulties. The water of the Rhône can descend to as low as 48in.; while during seventy-five days in the year it varies in depth between 80in. and the minimum 48in. In order to remedy this state of things, the Geneva-Paris Water Company propose to construct two immense reservoirs, capable of containing 160 million cubic metres of water, which will be emptied into the Rhône when it falls too low and so impedes navigation. Another proposal is to modify the level of the lake itself by 12in. as a reserve (the quantity of water being 160 million cubic metres), and so provide for the dry season of the Rhône. These are the apparent obstacles to the scheme.

As interest will have to be paid on the money borrowed to construct the existing water supplies and their works of distribution, the Municipality of Paris will need to see their way very clearly before placing a new debt of 450 millions of francs on the shoulders of the citizens. At Hermance, the adduction piping would be placed at a distance of 437 yards from the shore, and 52 yards deep in the lake. There would also be built a subterranean aqueduct from the starting point to the crossing of the Rhône; thence the piping would continue a perfectly straight course to Macon, which is 225 miles from Paris. At a distance of 162 miles from Paris the piping would cross the river Loire. Within fifty miles of the capital it would be in the vicinity of Fontainebleau, arriving at Versailles, to its terminus on the heights of Clamart overlooking the city and the Seine. It is estimated that the scheme would take four years and a half to complete. Of the total cost of 450 million francs, the steel piping alone would absorb 62 millions, the aqueducts 33 millions, the reservoirs at Paris 12 millions, and the whole subterranean works 199 million francs. Along its route the Geneva-Paris Waterworks will traverse forty-five towns and villages, as well as twelve more or less important rivers.

Another Thames Tunnel.—The West Middlesex Water Company intend to construct a tunnel, 14ft. in diameter, beneath the river at Richmond, to convey their new main.

A New Canadian Canal—the Soulanges Canal—has just been completed, at a cost of 5,250,000 dollars. It gives uninterrupted inland navigation for vessels not drawing more than 14ft of water from Quebec to the head of Lake Superior, a distance of 1,435 miles.

Six New Light Railways in the Suburbs of London are recommended by the Highways Committee of the London County Council. Overhead and underground systems will be employed. The latter is the more expensive, costing about £15,000 per mile of single line, while the overhead system costs about £12,000.

International Tramways Exhibition in London.—On June 30th next year there will be opened at the Agricultural Hall, Islington, an International Tramways and Light Railways Exhibition. This will be the first thing of its kind ever seen in Europe, though for several years there has been an exhibition of tramway apparatus and appliances at the annual meetings of the American Street Railway Association. An excellent list of patrons has been secured for the new exhibition.

Electric Light for Villages.—As a rule a village that is not situated near some good-sized town is lighted by dim oil lamps or is not lighted at all. But at Hartford, in Gloucestershire, which has about 800 inhabitants, a reform has been successfully carried out by introducing the electric light. The installation consists of twenty-nine lamps, the cost of thoroughly efficient maintenance being no more than £60 per annum, which is to be provided for by a rate of 2¼d. in the pound on houses, and ¾d. in the pound on land. As the rent of labourers' cottages does not average more than £5 a year—it is generally less—the charge per head to this section of the population will be about a penny a month. In return, the Hartford workmen will have their village brilliantly lighted.

Masters and Men.

Dundee Plasterers' Labourers Dispute.—The strike of plasterers' labourers in Dundee, which has been in progress for the past nine weeks, still continues, and there are about sixty men unemployed.

The Strike of Tinplate Workers in Bolton District has been settled by the masters granting an immediate advance of 1s. per week. The men promise to consider relaxations in their apprenticeship rules.

Dispute in the File Trade.—A considerable body of Lancashire steel file makers have been out on strike at Warrington for some weeks past. These men, though the work is arduous and dangerous to health, have only been paid at the rate of 4½d. an hour, and it requires prolonged hours, and even day and night work to earn 27s. a week. The men demanded increased pay amounting to 1s. a week, and this has been conceded by all except one firm. There are now about 350 men out on strike.

Nottingham Building Dispute. — The dispute between the master builders of Nottingham and the National Association of Operative Plasterers, which it was understood was settled at a conference a week ago, appears to have assumed a new aspect. The Association at Nottingham have declined to stand by the resolution of the National Association of Plasterers, on the ground that the dispute really is between operative bricklayers and plasterers. The point of difference is the demarcation of work.

Reconstitution of the Trades' Union Congress.—The Parliamentary Committee of the Trades Union Congress have decided to formulate a scheme for altering the standing orders of the congress with a view to meeting criticisms such as those of Mr. T. Burt, M.P., who recently declared that the congress was not to-day an efficient machine for the purposes for which it was formed. The scheme of reconstitution will be settled in detail during the next few months, and by the end of February it is hoped it will be in the hands of the unions represented at the Plymouth Congress, so that time may be given for the discussion of it before the congress meets next year at Huddersfield.

Workmen's Compensation Act Case.—At the Marylebone County Court, Judge Stonor, in giving judgment last week in the case of Bennett *v.* Aird and Sons, said the applicant in this case was employed by the respondents striking an iron wedge to open a road, underneath which water pipes were being laid by them. Another workman was striking the wedge alternately with the applicant, and knocked it on one side, and thereupon the applicant's hammer missed the wedge, swung right round, and dislocated his shoulder, which he had since been unable to use. The manager, who appeared as representative of the respondents, submitted that the case did not come within the Act. The learned judge, after considering the construction of section 7 of the Act and the significance of the words "mechanical power," said that on the whole he thought that the words "mechanical power" must in the present case be construed as *ejusdem generis* with those mechanical powers previously mentioned—viz., "steam and water," which act automatically and continuously after having been set in motion in the first instance by manual labour, and he therefore, on the whole, was of opinion that the present case did not fall within the Act, and gave his award in favour the respondents, without costs.

The Hull Building Trade Dispute.—A meeting of the Hull Master Builders Association was held at the beginning of last week to consider the latest phase of the dispute. The subject matter before them was a confirmation or otherwise of the proposals of their own committee to terminate the dispute by permitting the men to return to work upon the old terms, and to refer all disputes to a Board of Conciliation. The only point at issue between the committee and the men's union was the extent to which the latter clause should apply. The men were agreeable to a settlement on these terms, subject to it being made clear that only any future, and not the present dispute should be referred to the proposed Board of Conciliation. The bone of contention seems to have been the employment of non-union men. Agreements have been made with non-union men, under proper legal documents, for a term of years, and the firms which have done this neither consider it honest nor just to these workmen to throw them aside, without any consideration whatever in conceding the demands of the Union. There is a section of the masters, who, while supporting the strike, morally or financially, have done nothing to assist in the settlement by employing free labour; they have preferred to wait and have their old employees back. These masters, consisting of Messrs. F. Blackburn and Son, Mr. Goates, Mr. Beilby, Mr. Greenwood, Mr. Hanton, Mr. M. Harper, Mr. J. T. Skinner, Messrs. Sanderson, Mr. Wood, and Mr. W. G. Bray, president of the Masters' Association, have dissociated themselves from the policy of the majority of the members of the Association, and have sent in applications for the return of their men. All the bricklayers on the Society's books have been spoken for by these firms, and all the joiners with the exception of twenty. The joiners are being taken back on the old conditions, and are being given the halfpenny per hour more asked for. Other masters may now follow suit, but if not, there is likely to be considerable difficulty for the architects in making up a whole tender, as the contractors are nearly all of separate trades, and if one contractor is employing non-union men the others will not be able to get their union-men to work with the others. It is a most reprehensible position for the men to take up, for all must live, and should work side by side with amity.

The Creuzot Strike has been settled by M. Waldeck-Rousseau, acting as arbitrator between the employer and employed. This discussion at the conference was limited to six principal claims of the workmen. The decision is that: (1) The Creuzot Company is bound to pay the increase in salaries or piece-work promised in June, 1899, without reference to the success or failure of any contracts made between the Company and its contractors or clients. (2) As the workmen's unions are legally authorised organisations no special authority is needed for their recognition; that although the arbitrator cannot oblige an employer to consider the union as an intervening agent between his workmen and himself, it is natural and logical that in all questions relating to labour interests the union should serve as a medium between the two parties. But, although the agent of the union to which one of the parties belongs can be usefully employed as an intermediary if both parties consent, he cannot be imposed upon the employer. (3) Note is officially made of the declaration of the Company that its overseers will be instructed to make no distinction between workmen belonging to the labour union and those who do not, and that no interference will take place with the political or religious acts or utterances of the workmen outside the workshops. (4) One delegate will be selected from each shop and each guild every two months, except in urgent cases, to confer with the representatives, and, if need be, with the directors of the Company. (5) No workman shall be dismissed for having taken part in the strike. (6) In case of eventual stoppage a rotation shall be established between the workmen of the same class, and the proportion between union and non-union men who are obliged to remain idle shall be regulated in each department, according to their number, due account being taken in this rotation of those workmen who have families. M. Waldeck-Rousseau announced to the delegates that the Government had decided to present a Bill to the Chamber as soon as it meets in November for the better working and execution of the law of 1884 upon workmen's unions. It was M. Waldeck-Rousseau himself who proposed this law of 1884, and succeeded in having it adopted. It is stated that it will cost nearly 2,000,000 francs to bring the plant at the foundries into working order, while the loss to the strikers in wages is estimated at 1,000,000 francs.

Surveying and Sanitary Notes.

A Main Drainage Scheme for Bristol has been adopted by the Bristol City Council. It is estimated to cost £490,000.

Mr. William Roberts, surveyor, of Edenwood, Whallay Range, and of Manchester, who died on February 18th last, left personal estate valued at £15,966.

Leeds Sewage Disposal. — The Leeds Corporation Sewerage Committee have sanctioned the carrying out of two experiments at Kewstrop in connection with the continuous filtration of crude sewage.

New Sewage Works at Hampton were opened, on October 14th, by Sir F. Dixon-Hartland, M.P. No chemicals whatever are employed in the process and no sludge remains after the sewage is purified.

A Sanitary Precaution.—All the building materials in connection with the demolition of property in Leed's insanitary areas are to be destroyed, with the exception of the bricks, and these may be used for concrete only.

Proposed Names for London's Great New Street.—The following names have been suggested for the new street that is to be made from Holborn to the Strand: "Imperial Avenue," "Victoria Avenue," "Albert Edward Avenue," "Salisbury Avenue."

Proposed Sewage Works at Marple Bridge.—A Local Government Board inquiry was held on October 12th into the application of the Hayfield and Mellor Rural District Council to borrow £4,310 for laying mains in Mellor, making a connection with the adjoining township of Ludworth, and sharing in the cost of the outfall works. No opposition was offered.

Surveyors' Institution.—The president, Mr. T. M. Rickman, held two conversaziones on Thursday and Friday, October 12th and 13th, on the occasion of the formal opening of the new premises of the Institution in Great George Street, Westminster, S.W. The building has been designed by Mr. Waterhouse, and is very commodious. It has a handsome staircase decorated in two kinds of marble.

A Filthy Town.—Oporto recently became the topic of the hour on account of the plague, and if what is stated about the sanitary state of the town is true, it is surprising that everybody there is not dead. We are told that the town has a bad water supply, no drainage, a soil saturated with filth, no proper disposal of refuse, general overcrowding, and extreme poverty. A few British sanitary requirements would do a deal of good.

Kilmarnock New Waterworks.—Something like a deadlock has occurred in connection with the Kilmarnock Waterworks extension. The new dam, erected at enormous cost, has been found to be defective. The engineer is ill, and his partner declines to meet or consult with the Committee unless the Convener withdraws an adverse comment on the work. At a special meeting on October 11th the Council adopted a motion empowering the Committee to take what steps they may consider necessary.

Builders' Notes.

A Destructive Fire broke out on October 10th at Messrs. Roberts and Cooper's saw mills and timber yards at Brierley Hill, South Staffordshire. The damage is estimated at £50,000.

The Paris Exhibition.—An accident occurred on October 15th at the buildings in connection with the forthcoming exhibition. A wooden structure, 60ft. high and 105ft. long, suddenly collapsed. Nine workmen were more or less injured, but it is hoped, however, that all will recover.

A Model Chimney Shaft is about to be provided at the new power-house for the electric system of the London United Tramways Company at Chiswick. The new chimney, which is of American origin, is built mainly of steel, and lined with fire bricks. It is first of the kind constructed in England. The plans have been approved by the District Council.

How Old is the Carpenter's Plane?—Amongst other articles several iron implements have recently been unearthed at the Roman city of Silchester, which appear to have been the tools of a carpenter and a coppersmith or silversmith. The principal specimen is a carpenter's plane of quite modern type, although unquestionably more than 1,500 years old. There are also three or four axes, retaining their fine cutting edges and still quite serviceable; a number of chisels and gouges of all shapes and sizes, hammers, adzes, saws, files, &c. This is undoubtedly the most important find at Silchester since the discovery of the bronze Roman eagle, now at Strathfieldsaye some years ago.

Obstructing a Highway: Surveyor Fined.—James Smith, surveyor to the Tong District Council, was summoned, at the Bradford West Riding Court, on October 12th, for causing an obstruction by leaving a quantity of stones on the Bradford and Wakefield highway. It appeared that the defendant left a large quantity of road metal in heaps upon the road for several days. At night there were no lamps for the protection of traffic, but although several narrow escapes occurred, no serious accident happened. The defendant pleaded that the practice was followed by the surveyors for several other authorities in the district. A fine of 5s. and costs was imposed, with the alternative of seven days' imprisonment.

Chubb and Co.'s New Works.—Messrs. Chubb and Co., the well-known lock and safe makers, have opened a new works at Wolverhampton; these do not supersede, but are in addition to the well-equipped works in the Old Kent Road. The architect is Mr. Charles W. M. Mitcham, of London, who has been assisted by Mr. F. Beck, of Wolverhampton. The works have an area of nearly 20,000 superficial feet, are five storeys high, and are of red brick with stone facings. Electric light has been fitted throughout, the current being taken from the Corporation mains, and the workshops are airy and well ventilated. One of the chief features of Messrs. Chubbs' business is that for the whole of the eighty-one years of its existence the active managers have belonged to the family of which Mr. Charles Chubb (the inventor of the Chubb lock in 1818) was the head and founder.

London County Council.—At the meeting of the L.C.C. last Tuesday it was decided to spend £1,000 for enquiries and preliminary designs in connection with further asylum accommodation, including the visiting of foreign asylums. The recommendation of the Public Health Committee, to appeal to the High Court against the decision of the magistrates in respect of the registration of Salvation Army shelters as common lodging houses, was adopted. It was agreed to make a representation to the Local Government Board of the Vestry of St. Pancras having failed to appoint a sufficient number of sanitary inspectors. The Fire Brigade Committee reported that the additions to the Whitechapel fire station (the contract for which had been let to Mr. B. E. Nightingale for £3,657) would be begun shortly. A letter of resignation was read from Lord Onslow.

Stealing Lead from Roofs.—The solicitors' table at the Dewsbury Borough Court on October 10th was covered with pieces of lead stripped from the roofs and sides of buildings, and weighing more than 4cwt. The lead had been found in the possession of Walter Smithson, general dealer, Dawgreen, who was charged with receiving it, well knowing it to have been stolen; and John W. Moorhouse and Thomas and John Kelly were brought up on remand for stealing the lead. Smithson turned Queen's evidence, and admitted having bought various lots of lead from the Kellys and Moorhouse, part of which had been stolen from the roofs of houses in Dawgreen. Moorhouse, against whom nothing was known, was fined 15s. and costs. Thomas Kelly was committed for one month, and John (six previous convictions) for three months, both with hard labour. Smithson was severely reprimanded by the Chairman of the Bench.

A Futile Claim for Injuries.—At Yarmouth County Court on Thursday, Harry Davey, a labourer, sued John Ward, a builder, to recover damages at common law for injuries sustained while following his employment. Plaintiff said that on April 27th, while engaged on the upper tier of the scaffolding of a house, he was ordered to haul up some spars, but when he stooped down with the rope he stepped upon a plank, one end of which projected some distance over the support, and was not secured, with the result that it tipped up, and he fell to the ground, a distance of 30ft. He was taken to the hospital, and had since been under medical treatment for nine weeks. His wages were 4½d. per hour, and during all that time he earned nothing. The judge asked what negligence was complained of. For the plaintiff it was contended that the scaffold was improperly erected, in that the end of the deal projecting over the putlock should have been made secure. One witness said that had the planks been nailed down the accident would not have occurred; they were nailed afterwards. It was rare for scaffold planks to be nailed, but something should have been done in this case to secure the plank. Another witness said that the scaffold boards used were 8ft. long, and overhung the bearers 20in. He did not consider this safe. The judge said that there was no proof of negligence. The action had been entirely misconceived. If plaintiff brought an action under the Workmen's Compensation Act there would have been no necessity to go into the question of negligence. So far from this scaffolding being defective, plaintiff's own witnesses proved that the scaffolding was erected in the ordinary way. Scaffolding work was risky, and the fastening was only being wise after the event. He could not understand why the action was brought under common law, where plaintiff stood a chance of being beaten, when under other Acts he must have succeeded. All this expense had been incurred through the action being misconceived, and now plaintiff must begin *de novo*. There would be judgment for defendant with costs.

Iron Felt.—This is a new German insulating material which consists of long, strong, woollen fibres, impregnated with petroleum and coated with gelatine rendered insoluble, and also with rubber, which is afterwards vulcanised. On being subjected to heavy pressure, the felt assumes the form of plates, highly elastic and practically imperishable, which will bear an enormous weight, and whose surface is so hard as not to be cut by the sharp edges of bolt heads or iron girders. Placed as a cushion between rails and their chairs or sleepers, under plummer blocks, or between engine sole plates and their foundation, this substance is stated to prevent vibration.

Trade and Craft.

NATURAL AND ARTIFICIAL VENTILATION.

Messrs. Robert Boyle and Son, Limited, 64, Holborn Viaduct, E.C., have published an interesting and comprehensive little book on "Natural and Artificial Methods of Ventilation," which demonstrates the comparative values of the different systems. It gives some interesting notes on how natural ventilation may be successfully achieved with very simple means by an intelligent comprehension of the laws which govern the movements of air, and the utilisation of the powerful natural forces which are always in operation. Several pages are devoted to excerpts from the published accounts of the opinions of accepted authorities on ventilation. Towards the end of the book are coloured diagrams illustrating the superiority of a natural system of ventilation over an artificial one. Extracts are also given from the official reports of commissions on ventilation, appointed by the British, French, and American Governments, in which are described the evils of forced downdraught ventilation and of hot-air heating, and the dangers of open window ventilation in cold weather. We have all experienced at some time or other discomforts in a hall which is ventilated by one of the many downdraught systems. But in such a hall a cold is not the only thing to fear. On page vii. of the supplement to this valuable little work it is shown how in a hall ventilated on the downdraught principle, the air is delivered by fan propulsion just over a gallery, and is taken out at the floor, the air vitiated by the respiration of those seated in the gallery being thus forced by the downdraught to be reinhaled by those seated underneath. In halls with galleries it is almost an impossibility to arrange downward currents so that the air rendered impure in the galleries shall not contaminate that which is descending to supply the main floor below. It is also difficult to prevent the supply of air for the floor being drawn aside to the galleries. The advantages of a natural system are shown at the end of the book, where a diagram of a schoolroom is given. The radiating inlets for fresh air, screened and warmed, are on the floor and connected with openings through the external wall. The fresh air is thus properly supplied to the pupils and the products of respiration are driven through a foul air exit in the ceiling into the outside air. The proper diffusion of fresh air, cooled or warmed, is secured by its admittance at a low velocity through inlets at each side of the room. The work proves what should be apparent to all—that natural ventilation properly manipulated is far superior to artificial methods.

Failure of a Great Engineering Firm.—Messrs. Maudslay, Sons, and Field, the well-known engineers of Lambeth and Greenwich, are so insolvent that the wages bill, about £3,000 a week, cannot be paid without borrowing from week to week. Mr. Justice Darling, in the Chancery Division on October 11th, continued the appointments of the present manager and auditor, and gave them authority to raise a further sum of £1,500. It was mentioned that there would be nothing left after the debenture holders were satisfied.

Petroleum for Keeping Down Dust.—It appears that recent experiments made by the Pennsylvania Railroad Company with crude petroleum sprinkled over the tracks have not been entirely satisfactory. According to one authority, many fires have been caused by sparks falling on the oil, but, on the other hand, it is contended that that could not be the case, as all the combustible qualities in the oil had been abstracted. It has, however, been discovered that mosquitoes, which infest large portions of the country through which the railway passes, are being made very uncomfortable by the odour; and, as a consequence, are fast disappearing, so that at least one useful result has been obtained.

Engineering Notes.

Cleethorpes is to be lighted by electricity.

From Cairo to the Pyramids is the route of a new electric tram line that has just been opened. The distance is eleven kilometres.

Aberdeen Corporation Tramways are proposed to be extended and equipped throughout with electricity, at an estimated cost of £279,951.

A Railway from Alexandria to Shanghai, to compete with the Russian Trans-Siberian line, is reported to be promoted by an English syndicate.

The Temporary Bridge at Kew, which has taken about eight months to build, was opened on October 12th. The contractor states that the new bridge will be finished in two years' time.

Glasgow Water.—It is calculated that 380 gallons of pure water are delivered in Glasgow for every penny paid. The water is so soft that it is said Glasgow householders can pay their water rate out of what they save on soap.

The construction of a tramway from Hammersmith to Richmond, on the overhead electric system, is a scheme for which the New Electric Traction Co. intends to promote a Bill next year. The Company also proposes to construct a new street through the most crowded part of Richmond at its own cost.

New Purifiers at Ipswich Gas Works.—An important installation of new purifiers has recently been added to the Ipswich Gas Light Company's works near the Dockside. The consumption of gas in the town has doubled within the last fourteen years, and the gasometer power was considerably increased a year or two ago. The new purifiers that have necessarily been erected are in a house built of brick, 126ft. long, 63ft. broad, and 26ft. high to the eaves, with a steel roof covered with slates. The purifiers are formed of cast-iron plates, which, when put together, have the appearance of a large rectangular box, 120ft. long, 60ft. wide, and 5ft. deep, occupying nearly the whole of the floor space of the house. There are divisions in the box, so that four purifiers are really formed, each 60ft. by 30ft., and 5ft. deep. In the top are two covers to each purifier, made of 6in. by 3in. steel angles covered with steel plates ⅛in. thick. The inside of each purifier is fitted with 3in. by 3in. T-irons, on which rest wooden grids to carry the lime with which the gas is purified. There are four layers of these grids, and the lime is laid on them to the thickness of about 6in., through which the gas is made to pass. The joints between the covers and the purifiers are formed of india-rubber—so as to make the boxes perfectly gas-tight—in lieu of the old-fashioned water "lutes" which are more commonly used. The purifiers are carried on a raised floor formed of steel girders, supported by cast-iron columns; the inlet and outlet pipes are of 18in. diameter, and the flow of gas is controlled by a Weck's centre valve so arranged that the four purifiers can be worked either singly or together. The lime will be lifted from the basement by an elevator and conveyed to each purifier by a push-plate conveyor formed in the roof. Chutes are provided at four points of the conveyor, so as to distribute the lime as desired to any part of the purifiers, and the lime, when exhausted, is discharged through two discharging doors in the bottom of each purifier, and will ultimately be conveyed where desired by conveyors fixed below. This part of the plant is not yet erected. The whole of the elevating and conveying plant is worked by a 12-h.p. Crossley gas engine. The plant is the largest yet erected in the Eastern Counties, and the advantage of this is that the gas will become more completely purified, because it passes through the lime more slowly, and a longer period is allowed for the chemical action to take place, by which the gas is entirely freed of its impurities. The purifiers were supplied and put down by Messrs. C. and W. Walker, Limited, of Donnington, Shropshire.

New Patents.

The following abridged description is specially drawn up for The Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all Patent matters.*

6670. Portable Buildings.—Patentee: C. H. Leonard, of Grand Rapids, Michigan, U.S.A. Tubular uprights pass through foundation beams or sills, and are secured by nuts under the sills. Studs of T-shape are secured to the upper ends of the uprights and are adapted to pass through slots in the tubular rafters. The uprights and rafters are fastened together by turning the former through a right angle after the heads of the studs have been inserted through the slots. Forked castings fixed in the upper ends of the rafters are adapted to interlock with one another and the ridge pole. Panels, preferably of wood, are grooved at the edges so as to enclose the uprights and rafters and show a continuous panelled surface, both inside and outside. Adjacent panels are secured together by a cam-shaped fastening, which is pivoted to one panel and fits over a screw driven into the other panel. On pushing the fastening down, the panels are drawn together, and on lifting it until a notch or recess comes opposite to the screw the panels can be separated. Roofing sheets of the same width as the panels are secured by metal covering strips, formed with keyhole slots. These strips are fastened by pressing the slotted parts over screws fixed to the rafters and sliding them downwards until the narrow parts of the slots come under the screw heads.

6169. Chimney and Ventilating Shaft Tops.—Patentee: M. T. Lander, of Ashbrook Road, Upper Holloway, London, N. Wind inlets are left at two levels in the built-up chimney, and at the lower level a short pipe on a plate is set in the throughway so as to leave an annular space for the air currents, while from the upper level a cap is suspended above the short pipe to prevent down draught.

7802. Opening and Closing Skylights. Patentee: D. Weir, of Dowanhill Street, Partick, Glasgow. A bracket carries a hand-wheel and bevel gear for rotating a screw on which is a crosshead nut connected by links with the hinged skylight. On rotating the wheel either by handle or rope the skylight is opened or closed. Worm gearing may be substituted for bevel gearing.

1758. Fireproof Roofs and Floors.—Patentee: H. K. Bromhead, St. Vincent Street, Glasgow. Iron or steel joists, about 4in. deep, are placed about 18in. apart, and the spaces between filled in with blocks. The under surface is plastered, and the upper surface is covered with asphalt, cement, or other material.

1753. Baths, Lavatory Basins.—Patentee: J. Gourlay, West Campbell Street, Glasgow. The lavatory basin is fixed near the end of the bath, so that the handles of the supply cocks and discharge valve can be fixed in the bracket supporting the basin. The discharge pipe of the basin may pass either to the bath trap or to a separate trap. The back of the basin is fitted with a mirror. A hollow rib in the basin acts as an overflow passage.

6488. Ceilings, Walls, Slabs.—Patentee: G. Geppert, Nicolaistrasse, Breslau, Germany. Interlocking slabs for ceilings, walls, pipes, &c., are made with central grooves twice the width of the side ribs, and are arranged to break joint. In the construction of ceilings, the lower slabs rest with their plain faces undermost on the flanges of I-shaped bars, supported by the joists, and the upper slabs have their plain surfaces turned upwards. Halves and quarters of slabs are fitted in at the sides and ends of the joists, and the slabs are united by mortar to form a watertight ceiling. The inner edges of the ribs may by undercut, bevelled, rounded, or chamfered.

1966. Windows.—Patentee: J. Gammie, Thistle Lane, Thistle Street, Aberdeen. The lower portions of the pulley stiles with the parting and inner beads are made detachable, to facilitate the removal of the sashes from the frame for the purpose of cleaning the outside of the glass, &c. The movable parts of the stiles are secured to the fixed parts or to the sash stiles by pivoted or spring catches which enter recesses in the stiles. The illustrations accompanying the specification show a method of securing the sash cords or chains to the sash stiles, so as to allow the sash to turn when it is removed from the frame. The end of the cord is threaded through a hole in a tube or thimble, which is made large enough to receive the knot, and is arranged to slide in a socket in the centre of the sash stile. A flange at the end of the thimble limits the motion of the thimble within the socket.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		BUILDINGS—		
Oct.	20	Beverley—Board Room at Workhouse	Guardians	Botterill, Son and Bilson, 23, Parliament-street, Hull.
,,	20	Edinburgh—Workshop	School Board	R. Wilson, 3, Queen-street, Edinburgh.
,,	20	Lliniskea—National School	....	Rev. J. Coulter, Newtownbutter.
,,	20	Salford—Retaining Wall	Corporation	J. Holt, 6, St. Mary's-gate, Manchester.
,,	20	Willesden—Public Reading Room	District Council	Done, Hunter, and Co., Architects, Cricklewood, N.W.
,,	20	Plymouth—Superstructure of Offices	Prudential Assurance Company, Ltd.	A. Waterhouse and Son, 26, New Cavendish-street, W.
,,	21	Armagh—Post Office	....	Office of Public Works, Dublin.
,,	21	Farnborough—Police Cottages	....	W. J. Taylor, County Surveyor, The Castle, Winchester.
,,	23	Bingley, Yorks.—Infants' School	School Board	W. R. Nunns, Architect, Market-street, Bingley.
,,	23	Leeds—Clothing Factory	R. B. Brown and Sons	Chorley, Cannon, and Chorley, 15, Park-row, Leeds.
,,	23	Leamington—Free Library	Corporation	J. M. Bottomley, 13, Bond-street, Leeds.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Oct. 23	Nottingham—Eighty-six Cottages	Estates Committee	A. Brown, City Engineer, Guildhall, Nottingham.
,, 24	Manchester—Warehouse, Offices, &c.	Lancs. and Yorks. Railway Co.	Engineer, Hunt's Bank, Manchester.
,, 24	Walthamstow—Out Offices at Schools	School Board	W. A. Longmore, Bridge-chambers, Hoe-st., Walthamstow.
,, 24	Romford—Isolation Wards at Hospital	Joint Hospital Board	— Whitmore, 17, Duke-street, Chelmsford.
,, 25	Swansea—Extension of Workhouse	Union Guardians	G. B. Haynes, 8, Fisher-street, Swansea.
,, 25	Dovercourt, near Harwich—Additions to Schools	School Board	C. E. Butcher, 3, Queen-street, Colchester.
,, 25	Ruabon, Wales—Additions, &c., to School	Urban District School Board	J. Morrison and Son, Architects, King-street, Wrexham.
,, 25	Stoke-upon-Trent—Cottage Homes, &c.	Union Guardians	C. Lynam, Architect, Stoke-upon-Trent.
,, 26	Sandgate—Public Convenience	Urban District Council	A. R. Bowles, Engineer, Surveyor's Office, Sandgate.
,, 26	Canterbury—Asylum Buildings, &c.	Corporation	W. J. Jennings, 4, St. Margaret's-street, Canterbury.
,, 27	London, S.W.—Retaining Walls and Foundations to New War Office	H.M. Commissioners of Works and Public Buildings	Sir J. Taylor, H.M. Office of Works, Storey's-gate, S.W.
,, 28	Warblington—Public Offices, &c.	Urban District Council	F. Swinburne, West-street, Emsworth.
,, 31	Fletton—Schools	School Board	W. Boyer, 10A, Cowgate, Peterborough.
,, 31	Sandown, Isle of Wight—Higher Grade School	Brading School Board	J. Newman, Architect, Thornton, Sandown.
Nov. 1	Myton-on-Swale, Yorks.—School	....	W. Ward, Myton Hall, Helperby.
,, 2	Halifax—Chapel and Sunday School	....	M. Hall, 29, Northgate, Halifax.
,, 2	Alresford—Additions, &c., to Workhouse	Union Guardians	Board Room, Union Workhouse, Alresford.
,, 2	Deal—Underground Lavatory	Corporation	T. C. Golder, 23, Queen-street, Deal.
,, 3	Padstow, Cornwall—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.
,, 3	Banff, N.B.—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.
,, 7	Walthamstow—School Buildings	School Board	W. A. Longmore, Bridge-chambers, Hoe-st., Walthamstow.
,, 7	Enfield—Girls' Department and Assembly Hall	School Board	G. E. T. Laurence, 181, Queen Victoria street, E.C.
,, 7	London, W.—Female Staff Home, &c., &c., at Infirmary	St. George's Union Guardians	E. T. Hall, 57, Moorgate-street, E.C.
,, 22	Cricklade, Wilts.—Police Station	Standing Joint Committee	C. S. Adye, County Surveyor, County Offices, Trowbridge.
	ENGINEERING—		
Oct. 21	Oxton, Berwick—Waterworks	....	R. Paterson, 3, Williams-bank, Earlston.
,, 21	Hemel Hempstead—Gaslighting	Union Guardians	L. Smeathman, Clerk, Hemel Hempstead.
,, 23	Coventry—Wiring for Electric Light	Estate and Finance Committee	L. Beard, 10, Hay-lane, Coventry.
,, 24	Hastings—Covered Service Reservoir and Filter House	Corporation	P. H. Palmer, Engineer, Town Hall, Hastings.
,, 24	London, S.W.—Locomotives	Secretary of State for Indian Council	Director-General of Stores, India Office, Whitehall, S.W.
,, 24	Swinton, near Rotherham—Sinking Well	Urban District Council	R. Fowler, Engineer, Swinton, near Rotherham.
,, 24	Gloucester—Refuse Destructor, &c.	Electricity Supply Committee	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 24	Barking, Essex—Light Railway Plant	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
,, 25	Wigan—Electric Lighting	Corporation	H. C. Bishop, Borough Electrical Engineer, Wigan.
,, 25	London, N.—Secondary Battery	St. Mary's Vestry, Islington	Electrical Engineer, 50, Eden-grove, Holloway, N.
,, 25	Llanelly—Locomotives, Weighbridges, &c.	Harbour Commissioners	C. P. Fowler, Engineer, Harbour Office, Llanelly.
,, 27	Darwen, Lancs.—Tramway	Corporation	Borough Engineer, Town Hall, Darwen.
,, 30	Stonehaven—Harbour Extension	Harbour Trustees	J. Barron, 1, Bon Accord-street, Aberdeen.
,, 31	Chipping Campden—Waterworks	Rural District Council	N. Lailey, 16, Great George-street, Westminster.
,, 31	Aylesbury—Machinery at Sewage Disposal Works	Urban District Council	J. H. Bradford, 2, Rickford's-hill, Aylesbury.
Nov. 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
,, 30	Port Elizabeth—Railway	....	General Manager of Railways, Capetown.
Dec. 30	Panama—Aqueduct	Authorities	Commercial Department, Foreign Office, Whitehall, S.W.
,, 31	Porto Alegre—Electric	Municipality	Commercial Department, Foreign Office, Whitehall, S.W.
Jan. 3	Concepcion—Drainage and Waterworks	Chilian Government	Commercial Department, Foreign Office, Whitehall, S.W.
,, 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
	IRON AND STEEL—		
Oct. 23	Skipton—Water Mains	Urban District Council	J. Mallinson, Waterworks Manager, Town Hall, Skipton.
,, 23	London, W.—Railway Stores	Great Western Railway Co.	Stores Superintendent, Gt. Western Rly. Station, Swindon.
,, 24	Belfast—Steel Tramway Rails, &c.	Corporation	J. C. Bretland, City Surveyor, Belfast.
,, 25	Wigan—Cast-iron Boxes, Frames, &c.	Corporation	H. C. Bishop, Borough Electrical Engineer, Wigan.
,, 25	Llanelly—Railway Stores	Harbour Commissioners	C. P. Fowler, Engineer, Harbour Office, Llanelly.
	PAINTING AND PLUMBING—		
Oct. 20	Carlisle—Painting Works	....	G. D. Oliver, County Architect, Carlisle.
,, 20	Winchester—Painting, &c., at Workhouse	Union Guardians	Cancellor and Hill, 12, Jewry-street, Winchester.
	ROADS—		
Oct. 20	Walthamstow—Granite Kerb and Setts	Urban District Council	G. W. Holmes, Engineer, Town Hall, Walthamstow.
,, 21	Bishop's Stortford—Broken Flint Gravel	Urban District Council	Surveyor, Council Offices, North-street, Bishop's Stortford.
,, 21	Bishop's Stortford—Broken Granite, &c.	Urban District Council	Surveyor, Council Offices, North-street, Bishop's Stortford.
,, 21	Grimsby—Road Formation, &c.	G. S. Stephenson	W. Waller, 243, Freeman-street, Grimsby.
,, 23	Little Hulton, Lancs.—Road Improvement Works	Urban District Council	C. C. Hooley, 34, Brazenose-street, Manchester.
,, 23	London, N.—Repairs to Roads	St. Pancras Vestry	Burial Department, Vestry Hall, Pancras-road, N.W.
,, 24	Dover—Street Works	Town Council	H. E. Stilgoe, Borough Engineer, Town Hall, Dover.
,, 24	Belfast—Granite or Blue Stone Setts	Corporation	J. C. Bretland, City Surveyor, Town Hall, Belfast.
,, 24	Lewisham, S.E.—Kerbing, Tarpaving, &c.	Board of Works	Surveyor, Lewisham Town Hall, Catford, S.E.
,, 25	Fulham, S.W.—Making-up Streets	Vestry	C. Botterill, Town Hall, Walham Green, S.W.
,, 26	Ulverston—Kerb and Channel Stones	Health Committee	H. Whitlow, Surveyor, Theatre street, Ulverston.
,, 26	Withington, Lancs.—Street Works	Urban District Council	A. H. Mountain, Council's Surveyor, Town Hall, Withington.
,, 28	Shoreham, Sussex—Flints	Urban District Council	Town Surveyor, Town Hall, Shoreham.
,, 31	Silloth, Cumberland—Flagging, &c.	Holine Cultram Urban District Council	G. Armstrong, 24, Bank-street, Carlisle.
No date.	Tottenham—Tarpaving, &c.	School Board	G. E. S. Laurence, 181, Queen Victoria-street, E.C.
	SANITARY—		
Oct. 21	Hindley, Lancs.—Sewer	Urban District Council	A. Holden, Surveyor, Council Offices, Cross-street, Hindley.
,, 23	Westbury-on-Trym—Sewer, &c.	Barton Regis Rural District Council	A. P. J. Cotterill, Lonsdale-chmbrs., 7, Baldwin-st., Bristol.
,, 24	Bromley—Sewering, &c.	Urban District Council	Surveyor, Council Offices, Bromley, Kent.
,, 24	Exmouth—Sewers, &c.	Urban District Council	J. Mansergh, 5, Victoria-street, Westminster.
,, 26	Wilmslow—Constructing Sewers	Urban District Council	J. Bowden, 14, Ridgfield, Mansfield.
,, 27	London, N.—Slop Carts	Wood Green Rural District Council	Surveyor, Town Hall, Wood Green.
,, 30	Camberley, Surrey—Sewering	Urban District Council	W. J. Hodgson, Surveyor, High-street, Camberley.
Nov. 10	Darton, Yorks.—Sewerage Works	Urban District Council	W. H. Radford, Pelham-chambers, Angel-row, Nottingham.
,, 11	Kingsclere, Berks.—Drainage Works	Rural District Council	J. Barnes, Clerk, Kingsclere.
,, 15	Morecambe—Sewers, &c.	Urban District Council	Beesley, Son and Nichols, 11, Victoria-st., Westminster, S.W
	TIMBER—		
Oct. 20	Hull—Creosoted Redwood Paving Blocks	Corporation	A. E. White, City Engineer, Town Hall, Hull.
,, 23	London, E.C.—Telegraph Poles	Post-Master General	C. E. Stuart, Controller of Stores, General Post Office, E.C

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct. 28	Elland—Baths	2nd Premium £20, 3rd Premium £10	Clerk to Urban District Council, Offices, Elland.
Nov. 1	Horley, Surrey—Fire Engine Station	£10	R. L. Lowe, Clerk to Parish Council, Horley.
,, 30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *viâ* New York.
Dec. 1	Bury, Lancs.—Infectious Diseases Hospital	£100, £50, £25	Borough Engineer, Corporation Offices, Bury.

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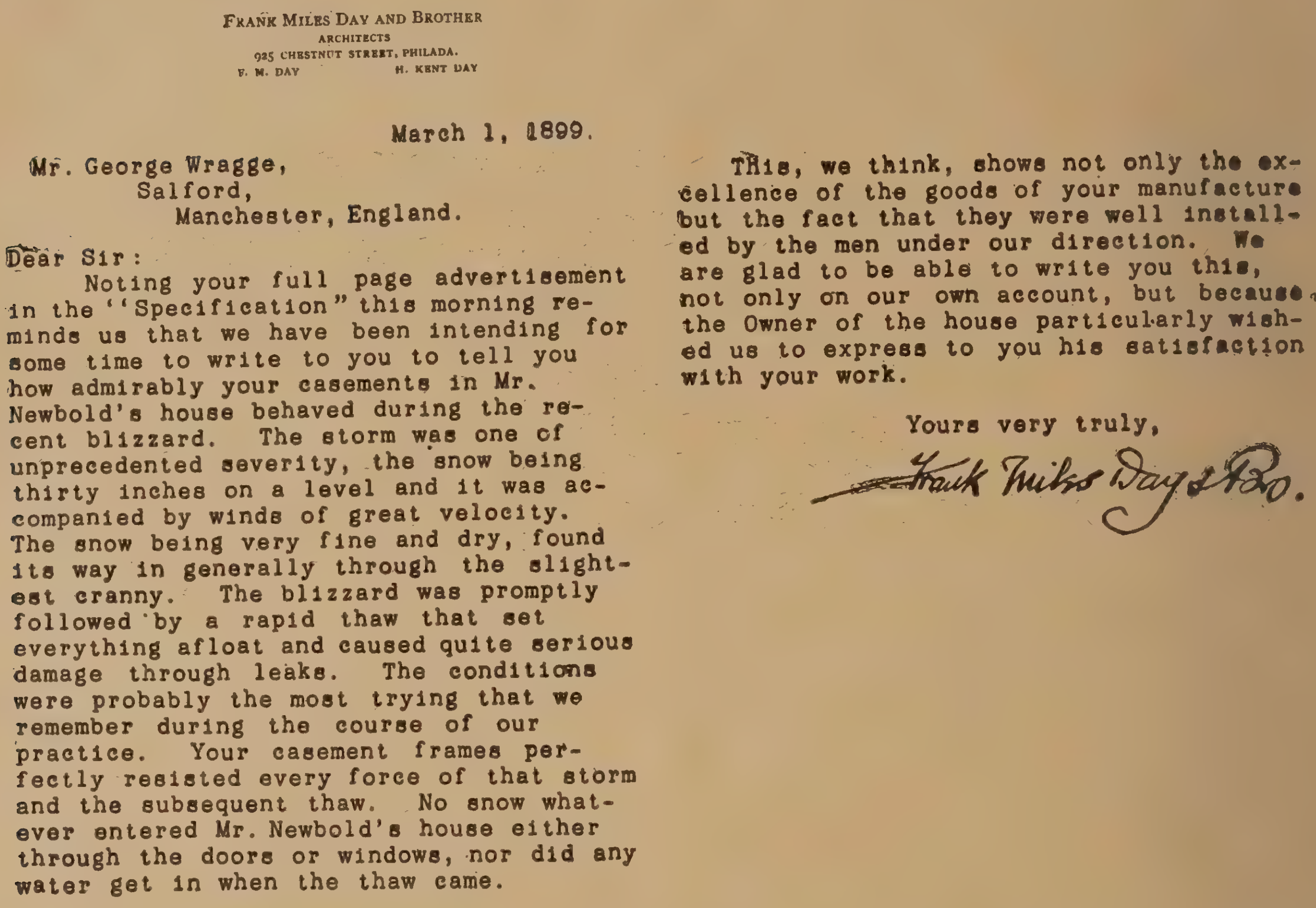

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March 1, 1899.

Mr. George Wragge,
Salford,
Manchester, England.

Dear Sir:

Noting your full page advertisement in the "Specification" this morning reminds us that we have been intending for some time to write to you to tell you how admirably your casements in Mr. Newbold's house behaved during the recent blizzard. The storm was one of unprecedented severity, the snow being thirty inches on a level and it was accompanied by winds of great velocity. The snow being very fine and dry, found its way in generally through the slightest cranny. The blizzard was promptly followed by a rapid thaw that set everything afloat and caused quite serious damage through leaks. The conditions were probably the most trying that we remember during the course of our practice. Your casement frames perfectly resisted every force of that storm and the subsequent thaw. No snow whatever entered Mr. Newbold's house either through the doors or windows, nor did any water get in when the thaw came.

This, we think, shows not only the excellence of the goods of your manufacture but the fact that they were well installed by the men under our direction. We are glad to be able to write you this, not only on our own account, but because the Owner of the house particularly wished us to express to you his satisfaction with your work.

Yours very truly,

Frank Miles Day & Bro.

The above *UNSOLICITED* Testimonial refers to a very important order for upwards of 250 BRONZE CASEMENTS supplied to Mr. Newbold's Mansion, Philada. U.S.A. The sections used were Nos. 20, 22 and 24, illustrated in our NEW CATALOGUE, pages Nos. 10, 14 and 18 respectively.

• • •

GEORGE WRAGGE,

WARDRY METAL WORKS AND THE CRAFTS, 152, 154, & 156
CHAPEL STREET, SALFORD, MANCHESTER.

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"Casements, Manchester."
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• • •

N.B. "THE CRAFTS," adjoining the present works, I have recently taken for the purpose of producing various artistic work but principally for STAINED GLASS AND LEADED WORK, under the management of Mr. JNO. E. C. CARR.

March 15th, 1899.

10/= A YEAR

Will Keep You Informed of Every Fact In British Building.

"Meets with our Entire Satisfaction."

A Professional Reader writes:

"I have bought No. IV., and am very much pleased with it, and wish it every success."
Warrington, 10th October, 1899.

A Leading Surveyor in a Southern County writes:

"I congratulate you on the success of 'Specification,' which I obtain regularly through my bookseller; and which meets a long-felt need."
Guildford, October 12th, 1899.

Messrs. Walter Macfarlane and Co. write:

"The issue meets with our entire satisfaction."
Glasgow, 12th October, 1899.

Contractor to War Office, Admiralty, and Board of Works, writes:

"Our City Engineer having shown me a copy of 'Specification,' I would be glad to have one for my office, and herewith enclose Postal Order."
Cork, 10th October, 1899.

PRESS OPINIONS.

"The Engineer" says of No. 4:

"The field embraced by this issue appears to grow with each half-yearly issue. No. 4 contains over 700 pages, and we note that the compilers are alive to the necessity of collecting together in separate divisions all information, although not quite of a kindred nature, yet likely to be sought for by men of a particular profession. For instance, 'Hygienic Engineer,' 'Roadmaker,' and a new miscellaneous section have been incorporated into one division, entitled 'Municipal Engineer.' We note, too, that prices have been introduced into most of the sections, and, we are informed, are being rapidly prepared for the others. In the 'Engineer' section all the papers are new, and contain articles on 'American Steel Construction,' 'Design of Underground Conveniences,' 'Lime Kilns,' 'Granite Paving,' &c. There is also an article on 'Engineers' Prices.' The labour involved in the production of such a publication must be immense, and it is to be hoped that it will meet with a commensurate reward."

"Electricity" says:

"SPECIFICATION No. 4 maintains its reputation as an architects' and engineers' compendium. The present issue has been corrected and brought up to date, and yet further enlarged. The various sections have been written by men whose names are a guarantee for their thoroughness."

Special Offer.

TO THOSE who have not yet purchased this colossal work we make this offer. Anyone purchasing from this office a copy of "SPECIFICATION" No. 4 who is dissatisfied with it can return same within 3 days from date of purchase, and the money will be refunded, provided that the copy is in the same condition as when purchased.

* * * * * * * *

The Publisher will send copies of "Specification" No. 4 to any address in the United Kingdom for 5/6, carriage paid.

EFFINGHAM HOUSE, ARUNDEL STREET, STRAND, LONDON.

REDUCED *FAC-SIMILE* PAGE OF BUILDERS' PRICES.

Continuation of **Specification.** *Joiner.*

		s.	d.	£	s.	d.
Per foot super.	2in. framed, ledged, and braced door, covered one side with ¾in. ploughed and tongued and beaded or V-jointed match boarding	0	9	0	1	8
Per foot super.	2½in. framed, ledged, and braced door, covered with 1in ploughed and tongued and V-jointed both sides match boarding	0	11	0	2	10
Each.	Cutting ends of ledges and letting into frame ...	0	3	0	0	3

DWARF DOORS AND FRAMES.

		s.	d.	£	s.	d.
Per foot super.	1in. square framed, one panel door	0	5½	0	0	11½
Per foot super.	1in. bead butt, or moulded and square, one panel door	0	5¾	0	1	1
Per foot super.	1in. bead flush and square, one panel door	0	6	0	1	1
Per foot super.	1in. bead butt and moulded, one panel door	0	6	0	1	2
Per foot super.	1in. square framed, two panel door	0	6	0	1	1
Per foot super.	1in. bead butt, or moulded and square, two panel door	0	6½	0	1	1½
Per foot super.	1in. bead flush and square, two panel door	0	7	0	1	1½
Per foot super.	1in. bead, butt and moulded, two panel door	0	7	0	1	2½
Per foot super.	1¼in. square framed, one panel door	0	5	0	1	2
Per foot super.	1¼in. bead butt or moulded and square, one panel door	0	5½	0	1	3
Per foot super.	1¼in. bead flush and square, one panel door	0	6	0	1	3
Per foot super.	1¼in. bead butt and moulded, one panel door	0	6	0	1	4
Per foot super.	1¼in. stop chamfered and square, one panel door ...	0	5	0	1	3
Per foot super.	1¼in. square framed, two panel door	0	6	0	1	3
Per foot super.	1¼in. bead butt or moulded square, two panel door ...	0	6½	0	1	4
Per foot super.	1¼in. bead flush or square, two panel door	0	7	0	1	4
Per foot super.	1¼in. bead butt and moulded, two panel door	0	7	0	1	5
Per foot super.	1¼in. stop chamfered and square	0	6	0	1	4
Per foot super.	Any of above, with bolection mouldings, extra ...	0	0	0	0	2

TWO PANEL DOORS.

		s.	d.	£	s.	d.
Per foot super.	1in. deal, square framed ...	0	3	0	0	10
Per foot super.	1¼in. deal, square framed ...	0	3½	0	0	11
Per foot super.	1¼in. bead butt and square	0	4	0	1	0
Per foot super.	1¼in. bead flush and square	0	5	0	1	1
Per foot super.	1¼in. moulded and square	0	6	0	1	1
Per foot super.	1¼in. bead butt both sides .	0	6½	0	1	1½
Per foot super.	1¼in. bead butt and bead flush	0	7½	0	1	2
Per foot super.	1¼in. bead flush both sides	0	8	0	1	2½
Per foot super.	1¼in. bead flush and moulded	0	8	0	1	3
Per foot super.	1¼in. stop chamfer and square	0	6	0	1	1
Per foot super.	1½in. deal, square framed ...	0	4	0	1	0
Per foot super.	1½in. bead butt and square	0	5	0	1	1
Per foot super.	1½in. bead flush and square .	0	6	0	1	2½
Per foot super.	1½in. moulded and square ...	0	6	0	1	3
Per foot super.	1½in. bead butt both sides ...	0	6½	0	1	3
Per foot super.	1½in. bead butt and bead flush	0	6½	0	1	4
Per foot super.	1½in. bead flush both sides	0	7½	0	1	4
Per foot super.	1½in. bead flush and moulded	0	8	0	1	5
Per foot super.	1½in. moulded both sides ...	0	7	0	1	4
Per foot super.	1½in. moulded one side, bead butt other	0	7	0	1	4
Per foot super.	1½in. moulded one side, bead flush other	0	8	0	1	4½
Per foot super.	Any of above with raised panels, extra	0	1	0	0	1½
Per foot super.	Any of above with bolection mouldings, extra ...	0	1	0	0	2
Per foot super.	Doors of any of above descriptions, but with three panels instead of two, should be priced extra to the above prices ...	0	2	0	0	2

Two Panel Doors in Woods other than Deal.

Prices per foot superficial including all materials.

		Pitch Pine. s.	Pitch Pine. d.	Sequoia. s.	Sequoia. d.	Honduras Mahogany. s.	Honduras Mahogany. d.	Walnut. s.	Walnut. d.	Teak. s.	Teak. d.	Spanish or Cuba Mahogany. s.	Spanish or Cuba Mahogany. d.
Per foot super.	1in. 2-panel square framed doors	1	2½	1	6	2	8	2	10	3	0	3	5
Per foot super.	1in. 2-panel bead flush and square doors ...	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super.	1in. 2-panel moulded and square doors ...	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super.	1in. 2-panel moulded and bead flush doors ...	1	5	1	8	3	1	3	3½	3	6	3	10
Per foot super.	1in. 2-panel bead flush both sides, doors ...	1	5½	1	8½	3	1½	3	5	3	7½	4	2
Per foot super.	1¼in. 2-panel square framed doors	1	4½	1	7	2	10½	3	1	3	4	3	9½
Per foot super.	1¼in. 2-panel bead flush and square doors ...	1	5	1	8	3	1½	3	5	3	7½	4	2
Per foot super.	1¼in. 2-panel moulded and square doors ...	1	5½	1	8	3	1½	3	5	3	5½	4	2½
Per foot super.	1¼in. 2-panel moulded and bead flush doors ...	1	6	1	8	3	2½	3	5½	3	10	4	2½
Per foot super.	1¼in. 2-panel bead flush both sides doors ...	1	8	1	10½	3	4	3	7	3	11	4	5½

FOUR-PANEL DOORS.

		Labour only. s.	Labour only. d.	All materials and labour. £	All materials and labour. s.	All materials and labour. d.
Per foot super.	1in. deal, square framed ...	0	3½	0	0	11
Per foot super.	1¼in. deal, square framed ...	0	4	0	1	0
Per foot super.	1¼in. bead butt and square	0	4½	0	1	1
Per foot super.	1¼in. bead flush and square	0	5½	0	1	2
Per foot super.	1¼in. moulded and square	0	6½	0	1	2
Per foot super.	1¼in. bead butt both sides ...	0	7	0	1	2½
Per foot super.	1¼in. bead butt and bead flush	0	8	0	1	3
Per foot super.	1¼in bead flush both sides	0	8½	0	1	3½
Per foot super.	1¼in. bead flush and moulded	0	8½	0	1	4
Per foot super.	1¼in. stop chamfered and square	0	6½	0	1	2
Per foot super.	1½in. deal, square framed ...	0	4½	0	1	1
Per foot super.	1½in. bead butt and square	0	5½	0	1	2
Per foot super.	1½in. bead flush and square	0	6½	0	1	3½
Per foot super.	1½in. moulded and square ...	0	6½	0	1	4
Per foot super.	1½in. bead butt both sides	0	7	0	1	4
Per foot super.	1½in. bead, butt and bead flush ...	0	7	0	1	5
Per foot super.	1½in. bead flush both sides	0	8	0	1	5
Per foot super.	1½in. bead flush and moulded	0	8½	0	1	6
Per foot super.	1½in. chamfered both sides	0	7	0	1	2
Per foot super.	1½in. stop chamfered and square	0	7	0	1	3
Per foot super.	1½in. stop chamfered both sides	0	7½	0	1	3½
Per foot super.	1½in. stop chamfered and moulded	0	7½	0	1	3½
Per foot super.	1½in. moulded both sides ..	0	8	0	1	5
Per foot super.	Any of above with raised panels, extra	0	1	0	0	2
Per foot super.	Any of above with bolection mouldings, extra ...	0	1½	0	0	2
Per foot super	Any of above with upper panels quirk - moulded, extra	0	1½	0	0	2
Per foot super.	2in. square framed doors ..	0	5½	0	1	3
Per foot super.	2in bead butt and square .	0	6	0	1	4
Per foot super.	2in. bead flush and square..	0	7	0	1	5
Per foot super.	2in moulded and square ..	0	7	0	1	5½
Per foot super.	2in bead butt both sides ...	0	7	0	1	5½
Per foot super.	2in bead butt and bead flush	0	7½	0	1	5½
Per foot super.	2in. bead flush both sides ...	0	8	0	1	7
Per foot super.	2in. bead flush and moulded	0	7½	0	1	8
Per foot super.	2in. chamfered both sides ...	0	7½	0	1	3
Per foot super.	2in stop chamfered and square	0	6½	0	1	4

THE FINEST COMPILATION OF BUILDERS' PRICES.

REDUCED *FAC-SIMILE* PAGE OF SPECIFICATION CLAUSES.

Continuation of **Specification.** *Concretor.*

WORKMANSHIP.

GENERALLY.

24. Proportions. Proper boxes or measures must be provided for accurately measuring the proportions of the various materials for the concrete. Such proportions to be ascertained by actual measurement at each mixing.

25. Mixing. The materials for the concrete are to be mixed by first filling a cubic yard or other suitable measure with the aggregate, then adding the cement (which must be separately measured). The whole to be twice turned over dry, then shovelled into a third heap, at the same time adding from the rose of a watering-pot sufficient water only to make the ingredients cling together. The materials to be again turned over in a wet condition before being removed and deposited in position. All necessary precautions must be taken to prevent the cement being blown away during the mixing.

26. Porous materials to be wetted. The whole of the coke breeze, broken brick, stone, or other porous aggregate to be well wetted with water before mixing, turned over, and allowed to drain, so that the surfaces may be damp, but not wet, when required for use.

27. Concrete to be freshly made. The concrete is to be mixed in convenient quantities to suit the requirements of the work. The chopping up and use of concrete or cement which has begun to set will not be permitted.

28. Levelling. All concrete when deposited in position is to be carefully levelled or laid to falls as may be required, and brought to an even and finished state.

29. Setting. Every care must be taken not to disturb the concrete whilst setting. In all cases where it is found absolutely necessary to pass over newly formed concrete, planks are to be carefully laid down.

30. Work prohibited during frosty weather. No concrete work shall be executed during frosty weather, nor even if there shall be any probability of a frost occurring before the concrete has had sufficient time to set.

FOUNDATIONS.

31. Concrete in Trenches. The concrete to be lowered into the trenches and not thrown in. After the concrete has been deposited in position it is to be well worked against the sides of the trenches by means of a spade or trowel, lightly rammed with wooden beaters, properly levelled, and brought to an even surface.

32. Building on Concrete. An interval of seven days (or such other period as may be directed) is to elapse between the completion of the concrete foundations and the commencement of any building upon them.

UNDER BOARDED FLOORS.

33. Laying. The concrete to be 6in. in thickness, lightly rammed with wooden beaters until the moisture rises to the surface, floated to a smooth and even face and finished to proper falls or levels.

UNDER TILE OR OTHER PAVEMENTS.

See Clause 33.

PAVING.

34. Laying. The concrete paving to be 6in. in thickness, finished with a granite surface, and smoothly floated to proper falls or levels.

35. Granite Surface. The surface of the concrete paving to be formed with a layer of granite concrete 1in. in thickness, lightly rammed with wooden beaters and floated to a perfectly smooth and even face. The entire thickness of the paving to be laid and finished in one operation.

36. Expansion Boards. Provide and fix expansion boards or slips at intervals of every 12ft., including removing same at completion, filling up the cavity with concrete and making good the surface.

37. Watering Surfaces. The finished surface of the concrete to be kept damp for at least seven days (or fourteen days) after being laid, by covering with wet sand or sawdust. The sand or sawdust to be kept moist during the period named by frequently sprinkling it with water from the rose of a watering-pot.

38. Protection. The concrete surfaces to be properly protected from any injury that might be caused by passing traffic, falling materials, etc.

39. Freedom from Discolouration. The surface of the concrete paving to be of uniform colour throughout, and free from any stain, discolouration, or other defect.

40. Surface Channels. Surface channels, having a shallow curved section, to be formed in the concrete paving where shown on the drawings. To be laid to proper falls, and neatly dished round the top of each gully

UPPER FLOORS.

41. Laying. The concrete to be hoisted to the required height, and carefully filled in between the rolled steel (or iron) joists to a depth of 9in. (or other specified thickness), lightly rammed with wooden beaters, and levelled and floated to an even surface. Each concrete floor is to be laid and completed at one operation, the necessary arrangements being previously made for carrying on the work without cessation.

42. Watering Surfaces. *See* Clause 37.

43. Sheeting. Provide and fix proper deal rough (or wrought) flat sheeting, with flush joints, including all necessary supports and strutting that may be required, and remove at completion.

43a. Alternative Clause. Provide and fix proper deal rough (or wrought) sheeting on proper centres or turning pieces, and of the curvature shown on the drawings. To include all necessary supports and strutting that may be required, and remove at completion.

44. Removal of Sheeting. The sheeting, &c., is not to be disturbed for a period of at least fourteen days after the concrete has been laid (or such other period as may be considered necessary), and it shall not be removed without first obtaining the sanction of the architect (or engineer) in writing.

45. Sheeting to be Wetted. The upper surface of the sheeting to be well wetted from the rose of a watering-pot before depositing the concrete upon it

WALLS, PARTITIONS, STANCHIONS, Etc.

40. Depositing. The concrete to be carefully deposited in position, and lightly rammed between the casing and around the iron or other cores as shown on the detail drawings.

47. Girders and Stanchions. All projecting girders and stanchions to be similarly encased with concrete where required.

48. Casings. Provide and fix proper deal casings with flush points, including all necessary timbering and strutting, and remove at completion.

48a. Moulds. Provide and fix proper moulds to all bull-nosed angles, reveals for door frames, chases, and recesses where shown on detail drawings, and remove at completion.

49. Removal of casings. The casings and moulds shall not be removed until the concrete has thoroughly set.

LINTELS.

50. Moulded Work. - The concrete for lintels to be filled into properly constructed moulds or boxes and well worked around the iron or other cores as shown on the detail drawings. The lintels to be made 18in. longer than the opening over which they are to be fixed, so that they may rest 9in. on the wall at each end. To be 9in. in depth for all spans not exceeding 4ft., and 12in. in depth for all spans exceeding 4ft. and not exceeding 6ft.

51. Cores to be Embedded. All lintels having a bed or width not exceeding 9in. to have a core consisting of a 3in. × 3in. rolled steel (or iron) joist weighing 10lb. per foot run properly embedded in the same. An additional joist to be added for every additional 9in. in width or bed of lintel.

52. Seasoning. The concrete lintels to be left in the moulds until properly set, and to be made at least six weeks before being required for building into position.

53. Moulds. Provide all necessary moulds, casings, and patterns that may be required for the proper construction of the concrete lintels as shown on the detail drawings

BRICKS.

54. Fixing Blocks. Breeze bricks to be built into the walls where shown on drawings or otherwise directed for the proper fixing of joinery, etc. The concrete to be filled into suitable moulds and allowed sufficient time to set and harden before being used.

SEA AND RETAINING WALLS.

55. Concrete to be carried up uniformly. - The concrete to be carried up uniformly over the whole area embraced in each section under construction, no part to be more than 3ft. higher than another. To be laid in horizontal courses not exceeding 18in. deep.

OVER 3000 MODEL SPECIFICATION CLAUSES.

Supplement to the Builders' Journal and Architectural Record, *October 18th*, 1899.

REASONS

Why you should purchase the 4th Number of Specification.

1.—It is the only book that covers the wide field of Modern Constructional Work.

2.—It contains 3,000 Specification Clauses, Builders' Prices, Building Act Regulations, a Directory, Articles on Planning and Designing, over 20,000 Experience Notes, with an Index to the whole.

3.—It is always ready for reference. If you wish to decide the best way to design a piece of work, the notes in Forty-four Sections are ready to assist you. In writing your Specification, Model Clauses are provided to save you time and thought. In the Building Act Clauses you will find all the regulations affecting your design, and with the help of the Prices you can easily get out your estimate.

4.—It is not the work of one man. Over 120 Skilled and Expert Contributors have assisted in its Compilation, contributing to those Trade Sections in which their expert knowledge is admitted. Accuracy and authoritativeness are thus gained, and the risk of errors of judgment or prejudice, which might be possible in one man's work, are avoided.

5.—In addition to its comprehensiveness, authority, and accuracy, it has the additional advantage of being the most inexpensive work of reference offered to the public. At the published price of **5/-** it is "A Marvel of Cheapness."

6.—It will save you hundreds of hours in your professional or business capacity.

Why you should not purchase the 4th Number of Specification.

NOTHING
BUT - -
PRAISE -

* * *

As yet Unanswered!

* * *

NOT A SINGLE NEGATIVE REMARK has been made by the thousands of Architects, Builders and Contractors who have purchased the early numbers of this Work.

Published at Effingham House, Arundel Street, Strand, London, W.C.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS.

October 25, 1899.
No. CCXLVI.

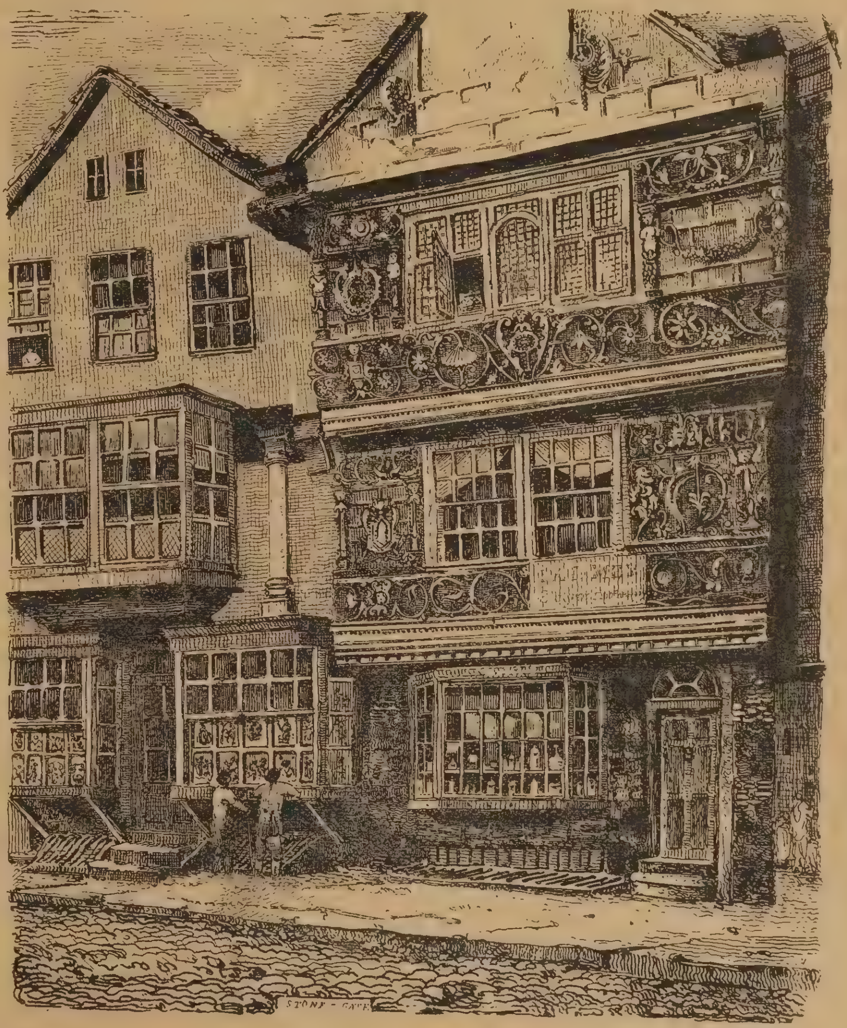
Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

Memorial Columns. The great memorial columns of the world are not very numerous. The two most celebrated ones still standing are in Rome; they are those of Trajan and Marcus Aurelius; each is of the Doric order, and stands in a comparatively confined space, gaining in apparent height and size in consequence. It is in accordance with what may be called the modern traditions of Rome that the figures of the two emperors have been replaced by those of St. Peter and St. Paul. Conspicuous in Paris is the column in the Place Vendome, built after the Roman model, Doric, and covered with spiral plaques of gunmetal representing the campaign of 1805, made from captured guns. The "Place" itself is remarkable as being one of the earliest attempts to build a number of residences in blocks, the whole resembling one or more single structures, a system destined to spread all over Europe. The column, of July commemorates the Revolution of 1830, and stands on the site of the Bastille, a black pillar with Corinthian capital, surmounted by a golden Mercury springing from a globe; it is placed so as to be visible down several streets, a conspicuous and handsome object at the end of the vista of each. London possesses one ancient and three modern columns; the oldest and finest is the monument, designed by Wren to commemorate the destruction of the capital in 1666; it is a stately pillar of beautiful outline, appropriately surmounted by a ball "enriched" with flaming copper rays. It is seen to great advantage by artificial light or moonlight; then with the Palladian building beside it, there is a certain Roman atmosphere about the picture. It stands on Fish Street Hill, and the name reminds us of the changed level of modern London, which has so altered and injured the view of this and other works of Wren. The "Hill," was then distinctly visible, and the whole of the long ridge from Tower Hill to St. Paul's upon which Old London was built; now, following the universal law, the growth of the town has been accompanied by a process of "levelling up," and a great number of buildings are less conspicuous than formerly.

In the West End the Nelson Column is graceful and dignified, with its Corinthian capital and carved abacus supporting the figure of the admiral, its pedestals with bas-reliefs and Landseer's lions. The Duke of York's column is uninteresting, but splendidly placed in an opening over a wide stone staircase with a glimpse of the park beyond. A very delicate and graceful work is the small column opposite Dean's Yard, to the memory of the Westminster scholars killed in the Crimea; it admirably breaks up and enlivens a rather arid space. J. C. P.

Sketching Old Buildings. Many of us have no doubt spent a good deal of time in sketching old buildings; but I wonder whether any have felt, as the writer does, a certain hesitation as to how these old buildings ought to be studied. Take, as an example, a town like Norwich, with its cathedral and castle, its churches and old houses. Here surely, if we know how to study them, are many works of which a knowledge should help us in our own art. Yet when you come to look at the buildings it is difficult to know where to begin. You will hardly make a perspective sketch of the whole cathedral, whether from the outside or inside, as you feel that you are not very likely to have a cathedral to build, so that the little knowledge you might gain would not be of much use to you. Neither can you measure the whole church; that would be too long a job, and would not teach you anything very much more useful. So you decide not to grapple with the building at large, but to look out for some smaller detail; you think of making a sketch of the south door (though you feel a certain repugnance at that owing to your conviction that every architect who has ever visited Norwich has done the same thing) or of the lectern; or you go out into the cloisters and decide to measure one of the windows; or you go right out into the close and begin to sketch a canon's house, dating from the reign of Anne or George; or perhaps you give up the cathedral altogether and go to St. Peter Mancroft as being more like a modern parish church. There are several smaller things to sketch, more full of detail; the roof, the tower, or the wooden bapistery. The general result would be that the sketcher would leave a town like Norwich with only a few scraps in his sketch-book, little corners, details, picturesque bits—rather a meagre harvest where mediæval builders have raised so rich a crop. Of the plan of the church and the circumstances which ruled it, of the arrangement of the monastery, of the town and the way it was fortified he will know little or nothing. It may be that in the next church he has to design he will find his drawing of the lectern or the baptistery useful, but he will not know a great deal more of mediæval buildings than before his visit. E. B. S. S.



External "Pargetry" on old house in Stone Gate, York (now pulled down).
(From an old engraving.)

Architecture in the Novel: "Zola's Vision of the New Jerusalem." It is interesting to compare the writings of novelists like Hardy or Huysman with some of Zola's. Hardy gives us as a background to his story the human rather than the religious side of the Middle Ages. In Huysman, the religion of mediæval life is the source of its architecture. He would have us feel that these stone structures of the middle centuries, are not merely the outcome of material necessities, but raised as monuments of man's thoughts about God and the universe. Each of these novelists approaches the architecture of the past in a reverent and loving fashion, but with a difference; the one in the religious and the other in the more human mood. Zola, less an artist but greater as a man, deals almost entirely with the present and the future. All the ugly aspects of modern life are unflinchingly portrayed in his books with a brutal energy that is the outcome of sincerity and a desire for truth, and the bedrock of life, at all costs. It is astonishing therefore to find that this resolute facing of life as he sees it, in all its most hideous aspects, has strengthened rather than decreased his belief that life is desirable, that we should run to meet it, to embrace it, and not sit in retirement bewailing, like the German philospher, "the vanity of existence," or, like Ecclesiastes, cry out, "Behold! all is vanity and vexation of spirit and there is no profit under the sun." Zola sweeps all this kind of thing on one side, and in some of his prophetic moments gives us a vision of what he hopes for. A vision as it were of the New Jerusalem and of the new cities to come. Here is an extract from the last page or two of his novel, "Paris:"

"Marie raised a light cry of admiration as she pointed towards the city. 'Look! Look!' she exclaimed, 'Paris is all golden, covered with a harvest of gold!' They all re-echoed her admiration, for the effect was really one of extraordinary magnificence. The declining sun was once more veiling the immensity of Paris with golden dust.

"But this was no longer the city of the sower, a chaos of roofs and edifices suggesting brown land turned up by some huge plough, whilst the sun rays streamed over it like golden seed, falling upon every side. Nor was it the city where divisions had one day seemed so plain to Pierre: Eastward, the districts of toil, misty with the grey smoke of factories; southward, the districts of study, serene and quiet; westward, the districts of wealth, bright and open; and in the centre, the districts of trade with dark and busy streets. It now seemed as if one and the same crop had sprung up on every side, imparting harmony to everything, and making the entire expanse one sole, boundless field, rich with the same fruitfulness. There was corn, corn everywhere, an infinity of corn, where golden wave rolled from one end of the horizon to the other. Yes, the declining sun steeped all Paris in equal splendour, and it was truly the crop, the harvest, after the sowing. 'Look! just look!' repeated Marie, 'there is not a nook without its sheaf wherever one may turn. It is as if there were now but one and the same soil, reconciled and fraternal. Ah! Jean, my little Jean, look! see how beautiful it is.'

"Then Marie, with a fine gesture of enthusiasm, stretched out her arms and raised her child aloft, as if offering it in gift to the huge city. 'See, Jean! see, little one,' she cried, 'It's you who'll reap it all, who'll store the whole crop in the barn!'"

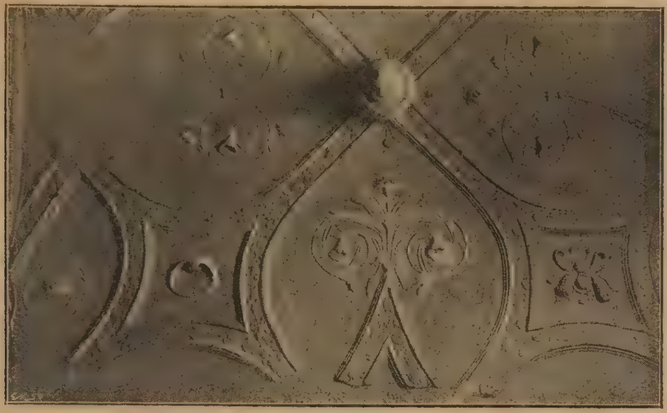
G. Ll. M.

On Reflection.

A Golden Opportunity. To anyone at all familiar with the Thames Embankment it must be glaringly apparent how little it is used by the citizens of London. This should not be so, for it has possibilities of forming a splendid promenade, one which would compare well with any of the famous boulevards of the Continent. The idea of forming the Embankment took practical form as far back as 1860, as the outcome of the widespread aversion from the offensive mud banks and unsightly buildings, though even now we possess a fine collection of the latter on the south side of the river. A Select Committee of the House of Commons deliberated on the matter, and a Royal Commission deliberated still more, and the respectable sum of £1,156,981 was incurred as the cost of the work. Altogether, about four millions of money have been spent on the Embankment, and it is surely a pity that after all this expense the efforts should be so little appreciated. In any other country than our own such a grand promenade would become a chief attraction and beauty spot; and though such a result entails certain objections, on the whole it would be a highly beneficial and satisfactory one. The river frontage is extensive, the width of the embankment is quite sufficient, and, as has already been stated, there are possibilities of effecting a great reform. The only persons who frequent the place in any numbers are the homeless and those who form part of the great criminal class of the city. With such a state of things existing, it is hardly fair to blame the public for not responding to the efforts which were made with the idea of benefiting them. It is those in authority who ought to make the initiative move. One correspondent has suggested that if artistically designed edifices, say of one or two storeys, were built, they would not interfere in any way with the existing buildings lining the Embankment, and would considerably add to the beauty of this unique site and make London the most fascinating city in the world. It has also been proposed that open-air cafés, band stands, &c., should be put up along the route, where the public could take recreation and enjoyment after the toils of the day.

Some Objections. There are, of course, certain objections to these suggestions, but in the main they sound the right note, that the old state of things should be swept away and a new and more attractive era inaugurated. At present the Embankment is badly lighted, a feature which is not usually calculated to add to the interest of a place, and this should be remedied —in fact, the idea has already been exploited, and it is to be hoped that very soon this much-needed reform will be a reality. Another objectionable feature is the roadway. This has never been satisfactory, and probably never will be, until wood blocks have been put down. At present (despite the great sums that have been spent in trying to improve it) the road gets into a puddle after heavy rains, and anyone wishing to cross has to wade through inches of mud. Then there are the unsightly riverside stations for the steamboats, and, in the centre of the Embankment, that most objectionable ventilator of the underground railway. Of all the London evils that want remedying this one of the railway ventilators should, and must claim immediate attention. The air of the city is polluted enough now and does not need additional dirt and obnoxious gases to be added to it from this source. Matters, therefore, are generally unsatisfactory, and the sooner something is done to make the Embankment more attractive than it is at present, the sooner will the public respond to the movement and be enabled to enjoy to the full the benefits which the site affords.

Japanese Craftsmen. Mr. Mortimer Menpes has made an innovation by importing a number of Japanese workmen to decorate his house in Cadogan Square—the first time, we believe, that such a thing has been done in London. Japan as an art nation holds a high place, and it is not too much to say that no nation in ancient or modern times has been richer in art *motifs* and original types than the Japanese. They have especially appreciated and adopted the system of adapting nature to requirements and conventionalising a natural object to render it better suited to their purpose. It has been asserted that the palmy days of Japanese art are past and gone, and that a period of decadence has set in; yet the spirit and motives of the old Japanese designers have not yet died out of their successors, who can still produce work of the highest quality. The Japanese artist aims at symmetry, but does so in a manner different from ourselves. He does not wish parts of his design to be matched or oppositely repeated, but rather seeks a general balance of parts not numerically even, not alike, but possessing those qualities of freedom and variety which give such a charming effect to the resultant work. British workmen, even of the very best class, are not equal to the task of dealing with Japanese designs in a thorough and efficient manner, and it would be idle therefore to blame Mr. Menpes for engaging craftsmen who can carry out his requirements. There is one matter which, however, requires consideration—that refers to the wages of the Japanese workmen employed. These have been at work for about a year, but they will return with only a few pounds in their pockets. They lived on a few pence a day, and their diet, we are told, chiefly consisted of heads and tails of fish—one which the British artificer would, naturally, consider wholly insufficient. But they appear to have thiven and to have been happy enough. It is well to state that they were imported purely on account of their being able to produce Japanese work in a more skilled and artistic manner than our own countrymen, but it is to be hoped that this cheapness of labour will not tempt some speculating "art merchant" to import some more Japanese workmen from mercenary motives, and without any real desire for art's sake. If the ordinary builder or decorator had a chance of getting hold of such talent at so low a figure he would be more than human if he refused to take advantage of it. His doing so, however, would raise some very serious problems, and, on the whole, we have no wish to see a large immigration of Japanese workmen into this country.



CEILING: TREVELYAN HOTEL, BARNSTAPLE.

BRITISH PLASTERWORK, PAST AND FUTURE.*

By GEORGE P. BANKART.

(Continued from page 149, No. CCXLIV.)

THE pendentive system was gradually adopted, and outlived the radial tracery system from which it came, although the radial basis is often seen on pendants when no corresponding ribs are visible on the ceiling proper. An excellent and most beautiful example of the pendentive ceiling without radial ribs is to be seen in the ceiling of the "Fish Room" at Audley End, and this ceiling is probably one of the most beautiful of the early school of English craftsmen. The moulded radial ribs are replaced by flat strap work, which is beautifully modelled all over with foliage in low relief. Sometimes the radial ribs were replaced by modelled foliage, giving the effect of a Gothic diaper. These simpler ceilings were dependent, to a great extent, on a scheme of colouring and gilding, the plasterer and painter becoming one and the same thing in work and in person.

The pendentive system, in its turn, was, by degress, abandoned for a geometric arrangement of ribs, but this treatment was no longer limited to straight lines. The ceilings abounded with inter-lacing quatre-foils, squares, lozenges, circles, and flame-like forms, with armorial bearings, emblems, and personal devices—filling in the spaces between the ribs. Figures were seldom introduced in these forms, unless of an armorial character.

The size of the sub-divisions gradually expanded, until it became customary to divide the area of ceiling into four quarters, whatever the size of the room, the pattern occupying a quarter-space, which was then reversed, and that again doubled over to complete the whole ceiling. This system, once adapted, led to the gradual abandonment of the geometric system, and contorted and complicated arrangements of clever design, full of new ideas, playfulness, and vigour, covered the ceiling area.

In the earlier ceilings the ribs were plainly moulded, resembling groin ribs, but as the power of execution developed, flat surfaces were introduced, which were frequently treated with an impressed decoration run off a revolving stamp (as with a book-binder's tool), and afterwards worked up by hand. Bosses of higher relief were introduced at intervals, done from a wooden stamp. These flat ribs generally have their edges moulded, with bosses at their intersection, modelled by hand.

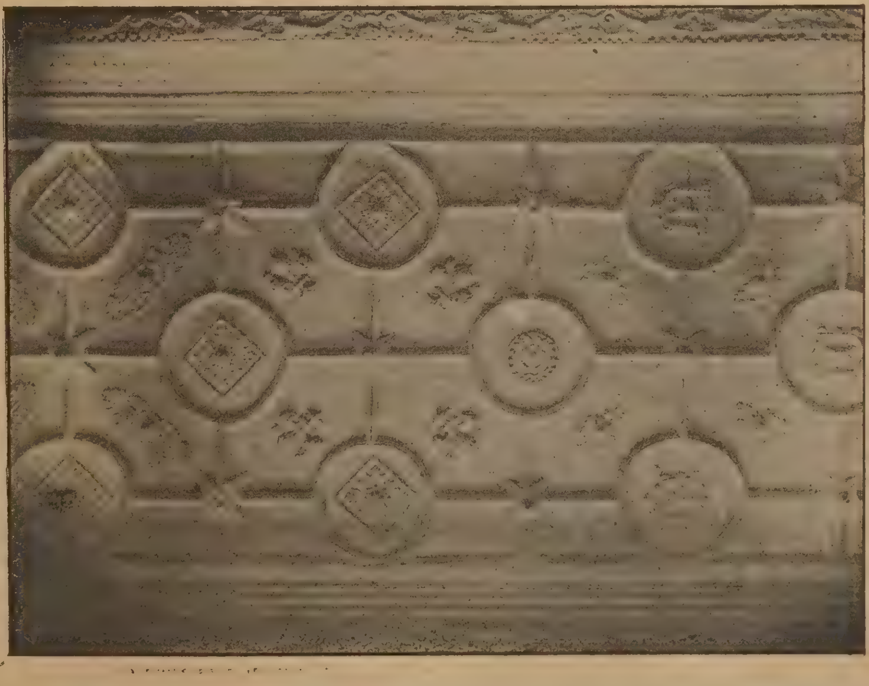
The "pargetry" work previously referred to, ollowing the partial abandonment of the stucco-duro, was used to decorate any part of the house naturally covered with that material, such as the ceilings, walls, chimney-breasts, and the wall space above the wainscot or tapestry. Externally, if the house were built of half-timber, the panels formed by the crossing of the timber framing were frequently stamped or modelled in some simple manner. If the walls were covered entirely with plaster they would in some cases be covered with some rough and vigorous design, as on the old house at Wyvenhoe, in Suffolk; or, perhaps, panels would be modelled in the gables between the windows. (See illustration on page 173). Or, again, some simple geometric pattern would be scratched on the surface of the plaster with a fan-like arrangement of pointed sticks, known as "stick work." (For illustration see next page).

In many instances wooden templates of various patterns were applied to the surface of the wet plaster round the windows and doorways, and the walls would then be dashed over with "rough-cast" or pebbles, the whole being afterwards lime washed by way of protection against inclement weather. This being done the templates were removed, leaving a sunk pattern with a smooth surface, which was frequently picked out in bright greens, yellows and other colours. For internal work again, plaster of Paris mixed with hair was often used, either stamped or cast, but not modelled, unless mixed with other materials.

In Queen Elizabeth's time the ceilings chiefly consisted of moulded ribs in geometrical patterns, with the spaces between enriched with sprays of flowers, and medallions of ornament worked in many ways. The ribs forming the main pattern were "cast" in a reverse mould, or "run" with a reverse template, in position, the flowers and medallions in the early days being nearly always modelled by hand. Afterwards, it was customary to stamp and then to cast them in plaster of Paris, even when the remainder of the ceiling was worked in position. The stamping, probably, may have been done in the following manner:—the design would be modelled in clay, and a mould would be taken from it in plaster and varnished with shellac or some similar material to stop suction; liquid plaster would be poured into the mould, and then applied to the ceiling, being held in position by a support from the scaffolding until sufficiently set to allow the mould to be removed; it would then be touched up where required with a small metal tool by hand. (See illustration on page 177). In later times the method was confined almost exclusively to casting in plaster of Paris from clay models and plaster moulds. This method was undoubtedly productive of beautiful results, but it cannot be regarded as so proper and desirable a method as modelling by hand *in situ*, or even by stamping and pressing the moist plaster. The method of "casting" was productive of a great softness of effect, combined with a certain dulness which may be looked upon as a virtue and natural quality of the material; but it had one great disadvantage, namely, the loss of intellectual work on the part of the craftsman by constant repetition of one idea by an increased amount of mechanical labour; nor could it be done *in situ*, as the best work admittedly was.

James I.'s reign was productive of much fine work, such as examples at Audley End, 1616; Aston Hall, 1620; Crewe Hall; Bramshill House, Littlecoats; Bickling Hall; Haddon Hall; Burleigh, and numerous other places.

At this period Scotland revelled in rich stucco work. There a system was common at one period in which leaves and fruit were cast in quantities, differing in size and variety, and being brought on to the scaffold in baskets assorted for use. The workman then drew his design on the ceiling, modelled the stems and branches by hand in position, stuck up the leaves and fruit where required, making good the connection afterwards. Of this variety of work, fine examples are to be seen at Kellie Castle, Holyrood Palace, and other places. Many of the ceilings at Holyrood Palace were worked by a company of "gentlemen" modellers, who were allowed to wear the sword and frills of the period. That these ceilings were worked entirely by hand in stucco is evident from the texture of the work itself, the irregularity of the mouldings, and the intricacy of the modelling. The



MIDDLE PART OF CENTRE PANEL IN CEILING OF UNOCCUPIED ROOM AT RIDDLESDEN OLD HALL, NEAR KEIGHLEY.

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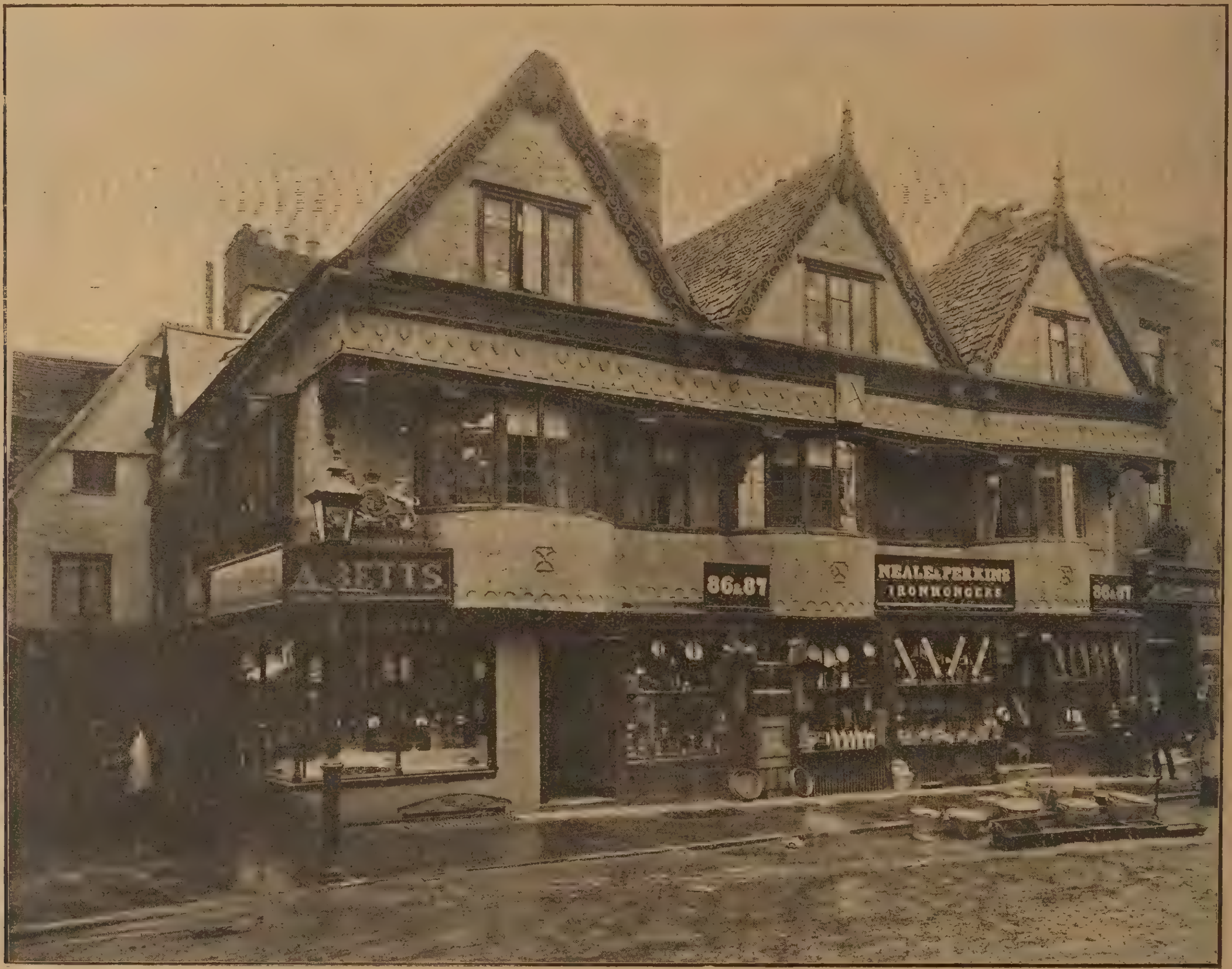
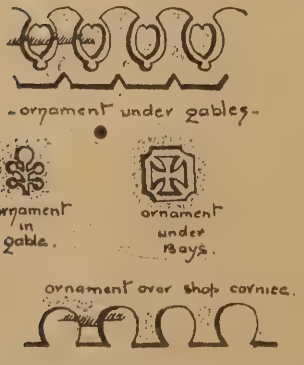
* A paper read before the Leeds and Yorkshire Society of Architects; redelivered to the Leicester and Leicestershire Society of Architects.

names of some of the workers are to be seen also upon close examination.

During the time of Charles I. the net-like arrangement of the ceilings became less used, greater prominence was given to the "compartment" under the influence of Inigo Jones, and the centres and smaller compartments were filled with exquisite low relief work, in which delicately modelled figures prevailed. That the stucco worker was not abolished by the troubles which followed is shown by the existence of "Sparrow House," Ipswich. Design again improved with the restoration, and the reigns of Charles II. and James II. produced work greatly influenced by the taste of Louis XIV. of France. In this work floral festoons played a large part in the decorative treatment, the modelling became wax-like in texture, too minute, but technically perfect—too perfect. Thus the general spirit of "design" as a whole became lost sight of, and attention was chiefly given to detail.



EXTERNAL "PARGETRY," BURFORD, OXFORDSHIRE.



ornament under gables.
ornament in gable.
ornament under Bays.
ornament over shop cornice.

About this period few Italian designers and stucco workers came into England, and the decorative plasterwork was chiefly done by Englishmen. Wren used his influence in refining the work, but in the French spirit.

(To be concluded.)

DISPUTED POINTS UNDER THE LONDON BUILDING ACT.

By GEORGE H. BLAGROVE,

Certificated Surveyor under the Act; Author of "Dangerous Structures," "Shoring and its Application," &c.

(Continued from page 132, No. CCXLIII.)

IV.—PARTY STRUCTURES.

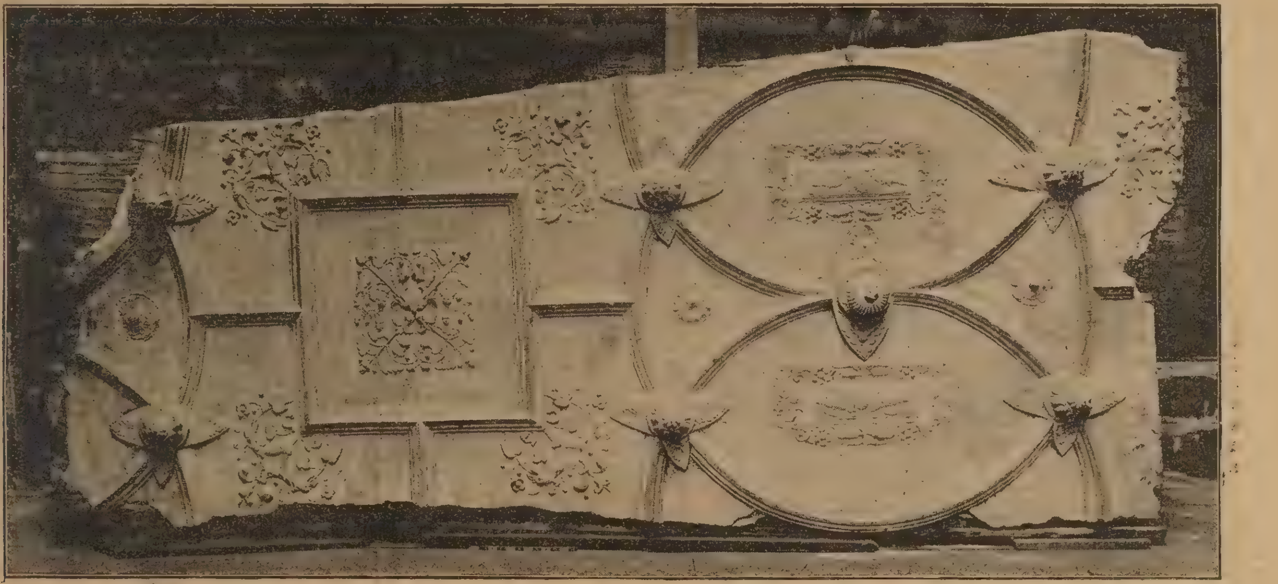
WHEN we read, under Section 74, that every building must be separated from any adjoining building "by an external wall or by a party wall or other proper party structure," we are naturally led to inquire what is a "proper party structure?" A party structure is defined, under Section 5 (20) to mean "a party wall, and also a partition, floor, or other structure, separating vertically or horizontally buildings, storeys, or rooms, approached by distinct staircases or separate entrances from without." I do not know any section in the Act that determines the nature of a party structure more particularly. Its thickness appears to be nowhere specified; and district surveyors are apparently left to use their own judgment as to whether it must be of fire-resisting materials or not. So far as my experience goes, district surveyors do not allow any vertical party division to be less than the minimum thickness of a party wall, namely 8½in., or say a 9in. wall of brick, stone, or concrete. In a case that came under my notice, a large shop was separated from the remainder of a building by brick walls and floors of iron and concrete. A 2in. wood framed partition was then erected, dividing the shop into two, which were to be let separately. The district surveyor objected to this as an irregular separation; but he withdrew his objection when a door was formed in the partition, because there was then no separation, although the door was always to be kept locked. In another case, an old building had long ago been divided by stud partitions on every floor, and each portion of the building had its separate entrance and staircase, and was separately occupied. Both occupiers agreed to let the whole of one of the upper floors to one tenant, and for this purpose they proposed to form a doorway in the stud partition on that floor. The district surveyor objected on the ground that there were two buildings in separate occupation, and they could not, under Section 77, be united. In vain was it urged that the stud partition was not a proper party structure; the surveyor insisted that it constituted a "physical separation," and that the proposed doorway was illegal.

External Walls Converted into Party Walls.

If a building owner allows his external wall to be built against by an adjoining owner, this converts it into a party wall. The adjoining owner then gains the space that would have been occupied by his own external wall, and practically acquires half the ground upon which the party wall stands. Such cases are familiar enough. But there is another way of converting an external wall into a party wall. One definition of a party wall under Section 5 (16) (*b*) is "a wall forming part of a building and standing to a greater extent than the projection of the footings on lands of different owners." In a case that came under my notice, a building owner had a 9in. external wall to an outbuilding one storey high, the footings on one side of the wall being on the adjoining owner's land. The building owner excavated to form a basement under the outbuilding, and underpinned his 9in. wall with a 14in. retaining wall. But, being desirous to economise in space, he brought the inner face of his 14in. wall flush with that of his 9in. wall, thus forming a set-off on the adjoining owner's side. The district surveyor then decided that the wall had become a party wall, because it stood at a greater extent than the projection of its footings on lands of different owners; and he required the building owner to raise his wall or lower his roof, so as to bring both into conformity with the provisions of Section 59.

A Party Wall Can Be a Separate Structure.

It appears that a party wall can be treated as a separate structure from either of the buildings which it divides. In the case of *Crow* v. *Redhouse*, a building had been burnt and taken down for more than half its cubical extent. Consequently, in re-erection, it came within the definition of a new building in Section 5 (6): "Any building which has been taken down for more than one-half of its cubical extent, and re-erected or commenced to be re-erected, wholly or partially, on the same site, &c." It was subject to all the rules of the Act applying to new buildings. The district surveyor claimed that the party wall should, like every portion of the building, be reconstructed in conformity with the provisions of the Act. On behalf of the builder, however, reference was made to Section 208: "Unless the Council otherwise allow, where a party wall or external wall not in conformity with this Act has been taken down, burnt, or destroyed, to the extent of one-half thereof (measured in superficial feet), every remaining portion of the old wall not in conformity with this Act shall either be made to conform therewith, or to be taken down before the rebuilding thereof." It was pointed out that the wall had not been destroyed to the extent of one-half, and it was contended that it need not be rebuilt in conformity with the Act. The court decided the case, on appeal, against the district surveyor, and allowed the old wall to remain. At the same time, it was admitted that the surveyor might have been within his rights if he had required only the new part of the wall to be rebuilt in conformity with the Act. The case of *Watson* v. *Macey and Sons* was somewhat similar, and confirmed the doctrine that a party wall may be treated as a separate structure, for the purpose of rebuilding.



PINDAR HOUSE.

Can a Wall be a Party Wall for only a Portion of its Height?

There is an impression among some architects that a wall between two separately occupied buildings of different heights is a party wall for only a portion of its height. I have heard it contended that such a wall is a party wall to a height of 15in. above the gutter or flat of the lower building (in buildings of the domestic class), and that above that height it can be an external wall with windows in it, provided that the owner of the lower building does not object. That this view is erroneous has been argued from Section 59 (1), which provides that every party wall shall be carried up (of thickness and height specified, according to the class of building) above the "roof, flat or gutter, of the highest building adjoining thereto." Against this plain argument, it is customary to cite the case of *Drury* v. *The Army and Navy Auxiliary Stores*, in which it is said to have been decided that a wall can be, for some part of its height, a party wall, and as to the remainder, an external wall. Let us see how far the decision in that case affects the interpretation of Section 59.

The Case of Drury v. The Army and Navy Auxiliary Stores.

This case was tried in the High Court on an appeal from a magistrate's decision. The building in question was of the warehouse class, containing some 650,000 cubic feet. Section 75 provides that (with certain exceptions which do not apply here) no building of the warehouse class shall extend to more than 250,000 cubic feet, unless divided by party walls in such manner that no division thereof extend to more than 250,000 cubic feet. The building had been divided in the manner required, and the dividing walls had been carried up as party walls to 3ft. above the roof of the first storey, in conformity with Section 59 (1). But a part of the building was more than one storey high; and here one of the dividing walls was carried up as an external wall to the upper storey, being pierced with windows above the said height of 3ft. from the lower roof. It was these windows to which the district surveyor had taken exception under Section 59; the magistrate had over-ruled his objection, and the magistrate's ruling was upheld on an appeal to the High Court.

The Decision of the Judges.

In delivering judgment Mr. Justice Wright quoted Section 75, and said:—"Obviously in that section the word 'party wall' is used, not in its technical sense, but merely as a convenient phrase for sub-dividing walls." Referring to the construction placed by the district surveyor upon Section 59, he said: "We need not absolutely decide that, because the point on which this case depends arises on Section 75. I think the real ground for our decision is that Section 75 has not the unnatural effect of making what is not a party wall into a party wall any higher than the point at which it ceases to be in point of fact a dividing wall." Mr. Justice Collins concurred in this decision, remarking that, but for Section 75, the wall in question would not be a party wall. He referred to the contention on behalf of the district surveyor, that the dividing walls of the warehouse were, by Section 75, constituted party walls, and therefore subject to all provisions relating to party walls; and he met this contention by quoting Section 5 (16) (*a*), which defines a party wall as separating adjoining buildings belonging to different owners. This, he stated, was the true definition of a party wall, and "the separation of adjoining buildings is the essential factor in one part, and the dividing of different parts of warehouses is the essential factor in the other case." He held that Section 75 did not make the wall a party wall any higher than was necessary for dividing the warehouse, and that Section 59 did not apply beyond that point.

The conclusion to be drawn is that party walls dividing buildings in separate occupation are entirely unaffected by the above-quoted case, which only relates to the subdivision of warehouse buildings in one occupation.

The Bristol Case.

The case of *Weston* v. *Arnold*, familiarly known as the "Bristol Case," has so frequently been cited in disputes about party walls, that I may perhaps be pardoned for referring to it here. This case turned upon the question whether the plaintiff's wall, which was a party wall in the ground storey, where it divided two separate buildings, must also be a party wall in the upper storey, where it was built against only on the plaintiff's side. The Court held that it was an external wall in the upper storey, and might be rebuilt as such, preserving windows in it which were ancient lights overlooking the defendant's property. The decision of the Court was founded upon the Bristol Improvements Acts, 1840 and 1847. In the former Act, Section 26 defines a party wall as being "between separate houses, buildings, or other premises;" and in the latter Act, Section 24 provides that "every wall between separate houses shall be a party wall." As one of the judges explained, it needed some special enactment to make a wall a party wall above that portion of it which serves to divide separate buildings. Such special enactment was not to be found in the Bristol Acts; but in the London Building Act such enactment is believed to subsist in Section 59, which provides that "every party wall shall be carried up above any part of any roof opposite thereto and within 4ft. therefrom."

Windows in Party Walls.

By Section 101 it is provided that nothing in the Act shall authorise any interference with easements of light or other easements relating to a party wall. Windows and ventilators are found existing in old party walls; and when buildings are erected or roofs are raised against such walls, the question arises how the provisions of Section 59 are to be applied. It appears that, if the owner of the windows or other openings does not object, the space on the adjoining side may be roofed over, without necessarily contravening any provision of the Act. When a roof is constructed against a party wall, under a window or other opening, the usual practice is to treat the sill of the window or the bottom of the opening as the top of the party wall, for the purposes of Section 59, in relation to the new roof. Of course it follows from this, that any lantern light or other erection opposite to a window in a party wall must be kept 4ft. away from it.

(*To be continued.*)

WITH GREEK BUILDERS.

BY JOHN A. MARSHALL.

(*Continued from page* 145, *No. CCXLIV.*)

VI.—CORONÆ AND EAVES TILES.

> "*The swallow builds the cornice round,*
> *Unconscious of the beauties she plasters up.*"—
> GOETHE.

REFERENCE has already been made in previous articles of this series to the corona, or main drip-stone of a Greek building; it is now proposed to consider this feature more especially in relation to the tiling, with which it was so intimately associated.

Virtually, the stones of the corona constituted the eaves of the timber roof—translated into stone; but practically they afforded a broad and even bed on the top of the frieze for the eaves tiles, and the rafters, while the overhanging portion kept the water which fell from the roof clear of the frieze and architrave. As a counterpoise to the projection in front the stones were tailed on to the frieze as far as possible, and often weighted by an additional course at the back, which received the feet of the rafters in notches cut for the purpose.

The jointing of the corona in buildings of the Doric type was regulated by the position of the mutules on the soffit; these were placed over the triglyphs and over the centre of each metope, and the corona was jointed at the side of every other mutule, to avoid cutting through the latter, and to break joint with the stones of the frieze. (See diagram from the Parthenon.) A noteworthy exception to this rule was the very early temple at Assos, where the joints were in the middle of the mutules, but, it should be noted, the mutules of the corona and the regulæ of the architrave are, in this instance, devoid of guttæ.

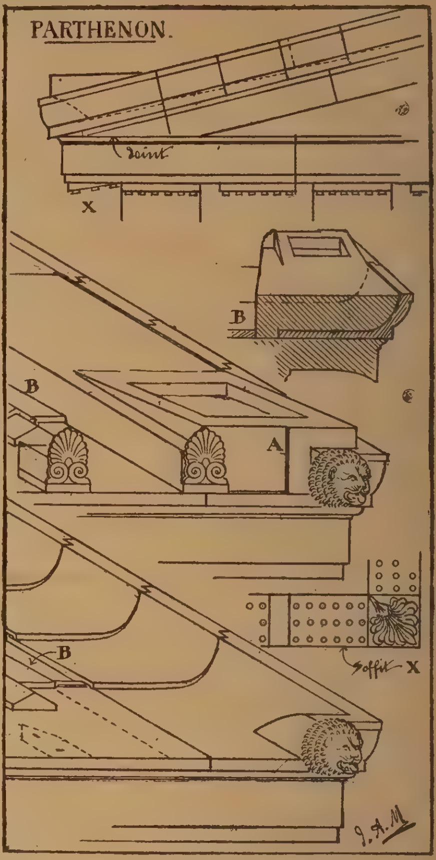
At the springing of the pediments a portion of the raking corona was sometimes worked on the same stone as the angle sima, with a level bed, resting on the angle stone of the horizontal corona, as at the Parthenon and the Propylæa. At other times we find a portion of the raking corona worked on the horizontal, so as to form a check against the pressure of the coping stones of the pediment, as at the Erectheion. The tendency of the raking stones to slip was, in all cases, further counteracted by the weight of the acroteria.

To receive heavy sculpture, the triangular cavity enclosed by the coronæ of the pediments was generally increased in depth by setting back the tympanum beyond the face of the frieze, so that the figures were not entirely supported by the overhanging portion of the corona, but were partly dependent on the frieze and architrave.

The refined under-cutting on the soffit of the raking corona—in curve like an eagle's beak—is worth noting, as obviating the depressive effect of a perfectly plain surface.

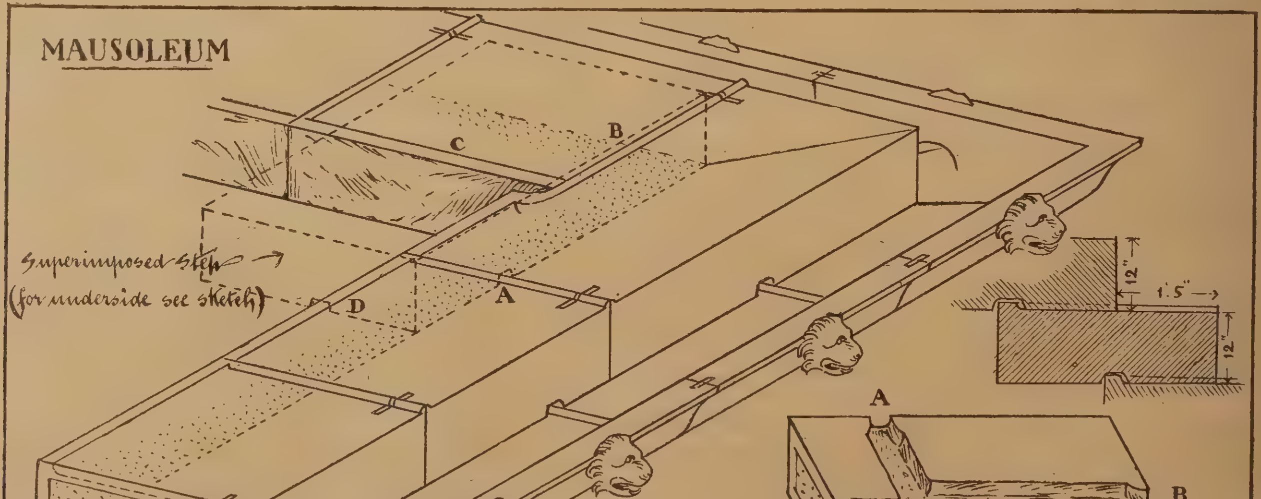
On the flanks of a building the top bed of the corona was prepared to suit the requirements of the eaves tiles, which varied considerably in different buildings, according to the size of the structure and the age in which it was erected.

In early work—prior to that of Periclean Athens—the eaves tiles were invariably of the same width and thickness as the general tiling, and to receive them the top bed of the corona was bevelled along the front to the pitch of the roof, as at Assos and Aegina; but when the temple was very large it was found more expedient to work the inclination on separate stones placed on the corona, as at Selinus (temples C and E) and the Zeus Temple at Olympia.



During this early period the shape and tenuity of the terra-cotta prototype, including the deep sima, was very often translated into marble, although the practical reason for limiting the thickness of burnt clay did not, of course, apply in the case of stone. (See restoration of eaves gutter for the archaic temple at Ephesus in the Museum).

It remained, apparently, for the Athenian architects to break away from the traditional type, by devising an arrangement for the eaves which was in every way superior to the earlier method. Instead of making the tiles uniform in width and thickness from the ridge to the eaves, and bedding the eaves tiles on



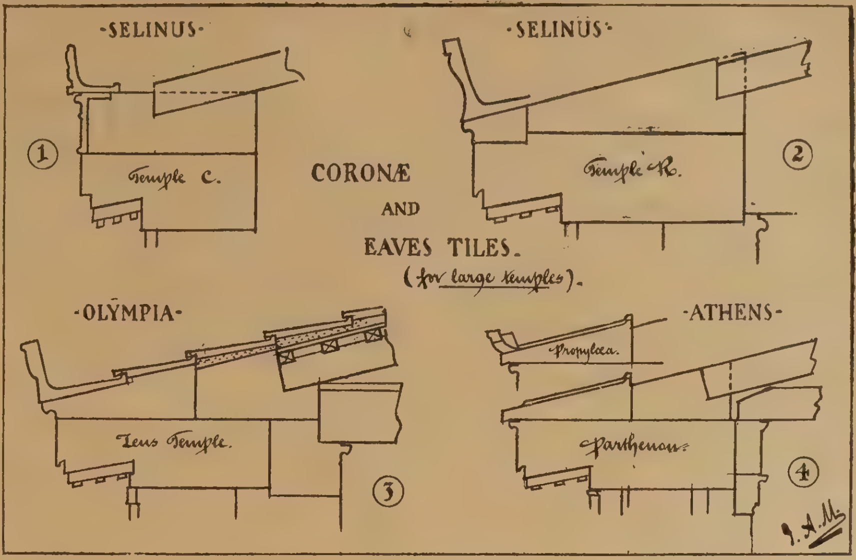
separate stones worked to the pitch of the roof, these stones are made to serve the purpose of tiles by shaping them on the top like the rest of the tiling; while to limit the number of joints, and thus ensure greater resistance to the pressure of the roof, the blocks were generally made to include in their length two or three of the ordinary tiles, as at the Parthenon and the Propylæa.

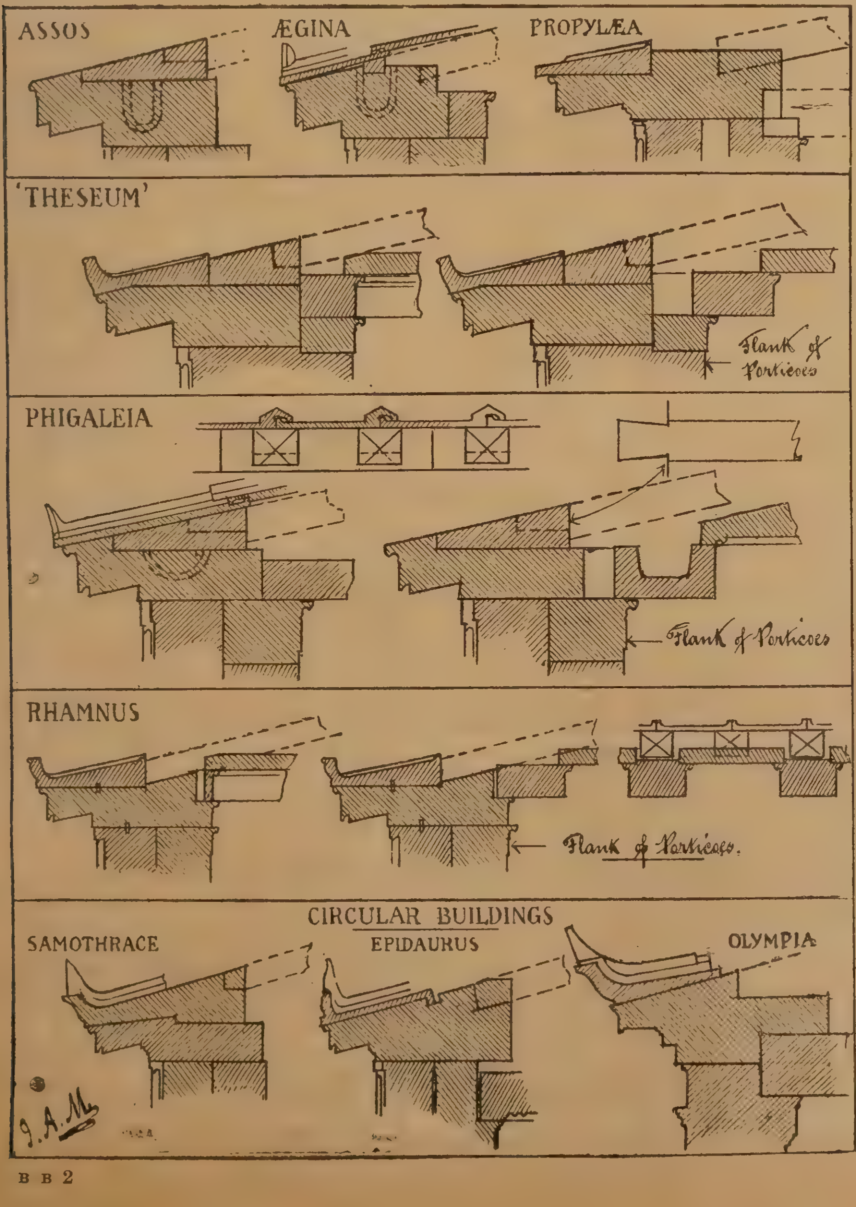
It should be mentioned that for buildings of the Doric type both the above methods were adopted, with slight variations, even down to late times; but for Ionic buildings the latter method was exclusively used, on account of the sima, which was always the crowning feature of the Ionic entablature and required as much counterpoise as possible.

As before stated, the rafters did not usually rest directly on the corona, but a separate course was placed on the back, and notched for the feet of the timbers; this extra course was worked to the pitch of the roof, in continuation of the bevel on the corona or of the slope on the eaves stones, as the case might be. For small buildings the separate stone plate was often omitted by making the corona sufficiently high at the back to catch the rafters. (See the sections from Aegina, Rhamnus, the wings of the Propylæa, the "Tholus" at Epidaurus, and the Philippeion at Olympia.)

The semi-circular grooves so often found cut into the ends of corona stones were for the purpose of inserting the loop of a rope, by which the stones were raised.

A few examples will now be given by way of further illustration; the sections given on each diagram are arranged as nearly as possible in chronological order, and are drawn to a uniform scale.





Selinus (*Temple C*). A very early and massive structure, somewhat abnormal in detail; the roof plate is a plain rectangular block the full depth of the corona; it is notched at the back for the timbers, and the front is cased with a terra-cotta facia, above which is fixed the terra-cotta sima of the eaves tiles. This, like some of the fragments found at Olympia and elsewhere, suggests the application of terra-cotta enrichments to timber construction—no doubt the prototype for the later developments in stone. (See the terra-cotta fragments in the Museum from Falerii and Lanuvium.)

Selinus (*Temple R.*).—Later than the preceding, it shows an advance, in having the inclination of the roof worked on the plate; the latter is very large but does not come to the front, as it was evidently found expedient for a building of such massive proportions to work the cymatium moulding of the corona on a separate stone.

Olympia (*Zeus Temple*).—This shows a further development, and is only a step removed from the full perfection attained at Athens. It was one of the largest temples in Greece, and, to limit the size of the corona stones, the cymatium of the corona is worked separately on large blocks—suggestive of the massive eaves tiles of the succeeding period.

For small temples the whole section of the corona was included in a single block, and if a separate blocking course was provided for the rafters it rested in a rebate, cut out of the back of the corona, and was thus kept in position against the thrust of the roof. To have worked this course on the corona would have entailed more labour than sinking the rebate. (See the sections from Assos, Aegina, and Phigaleia). We have included Aegina in the last category, but it is somewhat exceptional, for, instead of a separate plate for the rafters, the latter rest on the top of the corona, and a small block is inserted at the foot of each rafter to provide extra abutment. At Phigaleia the same object was attained by dovetailing the ends of the timbers, so that the whole depth of the rafter was made to abut against the back of the stonework. The corona, it will be seen, is after the early type, although this temple was probably built at a time a little later than the Periclean.

The examples from Athens and Rhamnus may be classed together, as exhibiting the fully developed method of the best period. The general principles underlying this method have already been described, and it only remains to point out some special peculiarities or modifications.

The Parthenon.—Perhaps the only example of so early a date where the corner stone of the sima remains *in situ*; its preservation is no doubt due to the fact that it forms part of a solid block, including, as before explained, a portion of the raking corona; it is also weighted, and kept in position by an enormous stone which supported one of the acroteria, and which is shaped on the underside to fit the curve and overlapping parts of the sima tiles on the pediment. (See an interesting diagram by Mr. Penrose, in his "Principles of Athenian Architecture.") The slight break marked A on our diagram, is, we believe, omitted by Mr. Penrose, but it certainly seems a refinement worth noting, forming, as it does, a square compartment for the lion's head, besides avoiding the unnecessary labour of sinking down the whole face of the stone in order to define the outline of the anthemion, which is worked on the same block. It will be noticed that a strip is cut out of the tiles at B to receive a corresponding strip worked on the underside of the superimposed block, so that it may catch the back of the eaves stone, but how the joint at B was made watertight is more than the writer can say.

The "Theseion," or "Hephæsteion"—to apply its latest designation—has the top bed of the corona level, with the exception of a strip along the front edge which is inclined; this was evidently done to limit the height of the cornice, and it has necessitated a corresponding bevel on the bottom bed of the eaves tiles. A similar expedient was adopted for the Temple at Sunium, but here a notch is cut along the back of the bevel as a check to keep the eaves tiles from slipping.

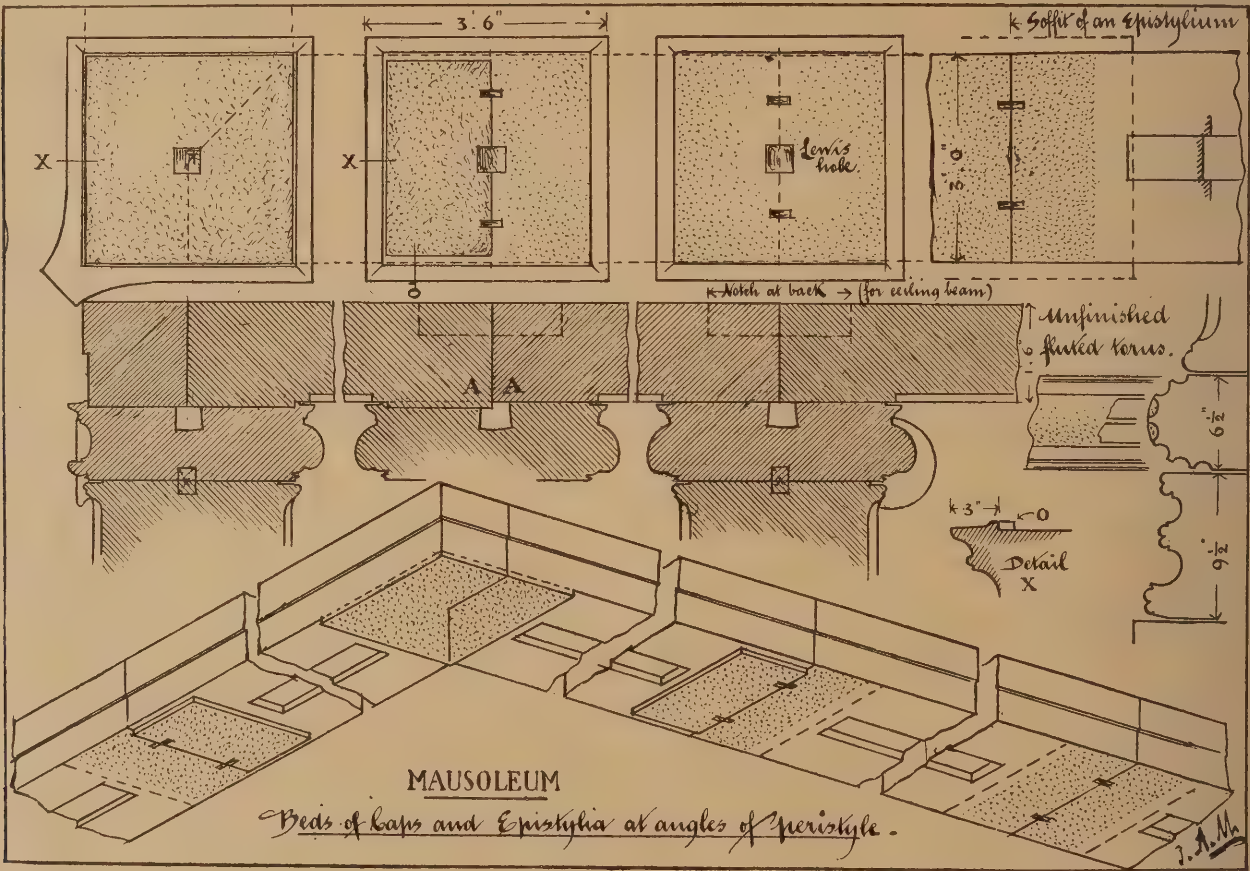
The Propylæa.—It is only necessary to note that for the wings of the Propylæa there was no separate roof plate, but the back of the corona stones was notched for the rafters, and the front rebated for the eaves tiles. The latter were always worked on separate stones, so that the joints could be adjusted to suit the ordinary tiles, otherwise in this case they might well have been worked on the corona. The reason for sinking the eaves tiles into the corona was clearly to restrict the depth of the cornice, while maintaining the necessary counterpoise.

Rhamnus.—The Temple of Nemesis was comparatively a small structure, and it was not worth while working separate plates for either the rafters or the ceiling beams, so we find them worked on the same stones as the corona.

The three examples from circular buildings of Hellenistic times are interesting as showing how the antefixa of the cover tiles were shaped to the back of the sima, so as to rest on the top edge.

The "Arsinoeion" at Samothrace, and the "Tholus" at Epidaurus were almost beyond the pale of pure Greek work, yet lavishly beautiful; while the Philippeion at Olympia—Ionic in type—possessed all the characteristics of degeneracy.

Finally, the Mausoleum may be noticed, although in the treatment of the roof and cornice this building presents but little in common with the preceding examples.



MAUSOLEUM

Beds of Caps and Epistylia at angles of Peristyle.

In the British Museum may be seen several stone steps which formed part of the pyramidal roof; there are also fragments of the eaves gutter.

The rolls, for keeping the water out of the joints, are received at the back of the stones by a raised rim, and the underside of each step is roughly channelled or grooved to fit over the projections.

Where the end of the groove shows on the riser (at A and B on the diagram) the opening is contracted and slightly undercut, or "throated," so as to fit closely over the rolls; on the top bed the stones are "weathered" and iron clamps, of late pattern, were let into the exposed top surface; the rims at the back would also serve to keep the steps from being pushed outwards.

While on this subject reference may be made to what seems to be a precaution against the displacement of the architrave by the pressure of the pyramidal roof at the angles of the building. In the Museum are three caps belonging to the columns of the peristyle; one of these is an angle cap, the top bed of which is slightly sunk, leaving only a narrow raised margin around the abacus; another cap has a similar sinking on half its bed only, while the remaining cap has no sinking whatever; it is evident, therefore, that a corresponding projection or seating was worked on the bottom bed of the angle architrave, to secure the latter to the cap.

This precaution, it may be observed, rendered the insertion of iron dowels unnecessary on the angle cap. At O the scamillus has a wider margin than at X, so that the contiguous ends of the epistylia AA were bedded in a uniform manner on the front edges.

The subject of roofing tiles as applied to Greek buildings is reserved for a final chapter.

(To be concluded.)

Reforming the Louvre.—The present unsatisfactory arrangement of the exhibits at the Louvre is to be thoroughly remedied by a scheme now receiving the attention of M. Georges Leygues, the Minister of Fine Arts.

Keystones.

Brockwell Park, London, S.E., is proposed to be extended by the acquisition of 42½ acres of wooded land. The park at present comprises 86 acres.

Improvements at King's College Hospital, Lincoln's-inn.—The electric light has been installed in this building, and the wards have been re-floored with teak blocks, at a cost of about £3,000.

Additional Workmen's Dwellings at Aberdeen are to be erected in Urquhart Road, but (owing, we understand, to some friction) Messrs. McMillan, and not the city architect, Mr. Rust, will prepare the plans.

Another Historic Estate for Sale.—White Webbs, Enfield, with about 250 acres of ground, which became notorious in connection with the Gunpowder Plot, will be put up for sale on the last day of this month.

Artisans' Dwellings at Burton-on-Trent are now being completed from designs by Mr. T. Jenkins, who has also prepared the plans for a second block. Mr. Jenkins is also the architect for the interior alterations now in progress at Stapenhill Church.

The Glasgow Institute of Architects held its annual general meeting on October 17th, the president, Mr. David Barclay, being in the chair. The report stated that the membership now amounts to seventy, exclusive of honorary members, and that the funds are in a satisfactory state.

New Baths for Manchester.—The Baths Committee of the Manchester Corporation have passed a resolution recommending the City Council to purchase 3,000yds. of land in Johnson Street, Bradford (the purchase price being 6d. per yard) for the erection of public baths.

Sale of a Grimsby Church.—St. Barnabas Church, King Edward Street, Grimsby, was sold recently. The proceeds will go towards building another church, which is to supplant the old one. The building is 84ft. by 34ft., of corrugated iron lined with matchboarding, and was built twenty-five years ago at a cost of between £500 and £600.

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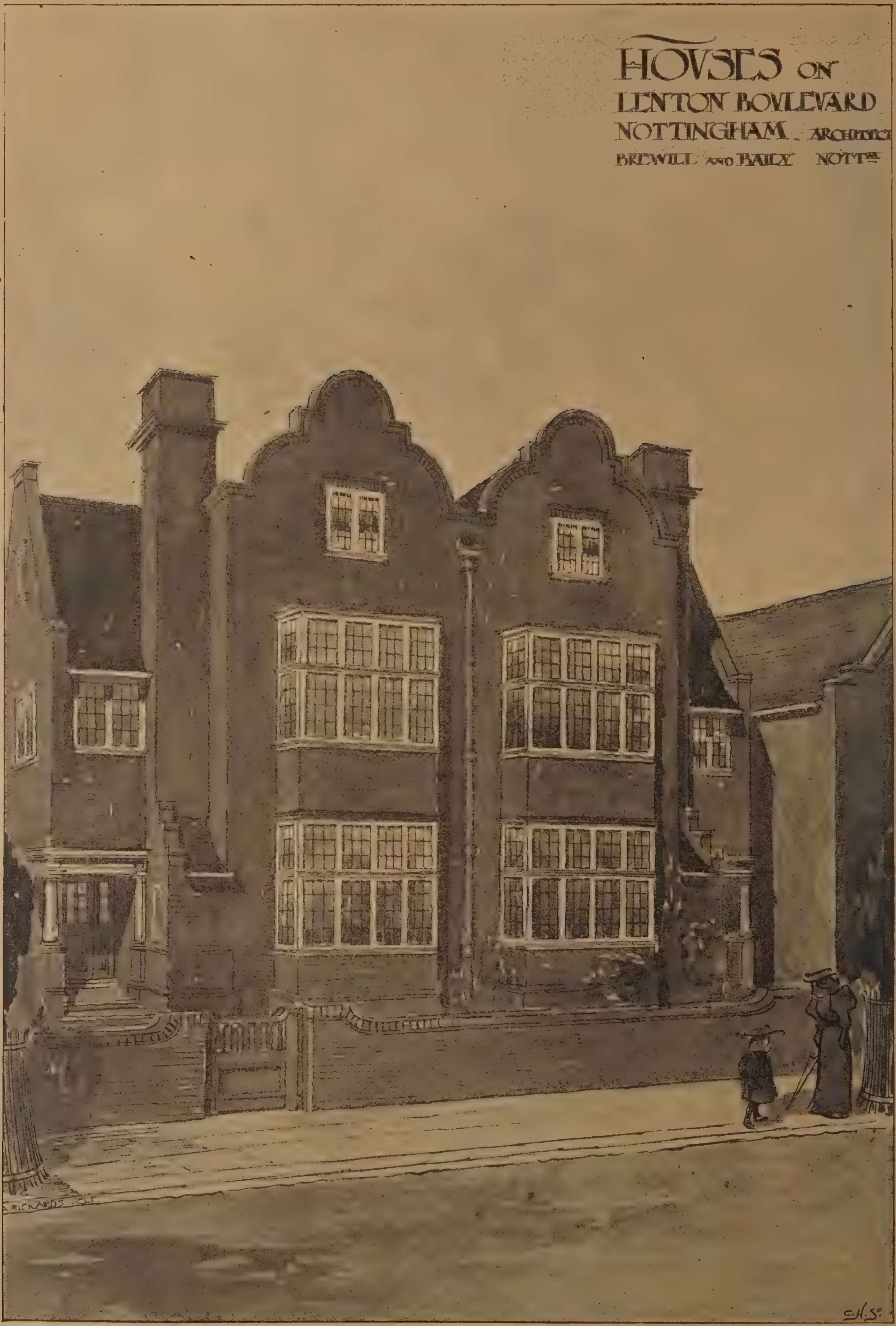

Brewill and Baily, Architects.

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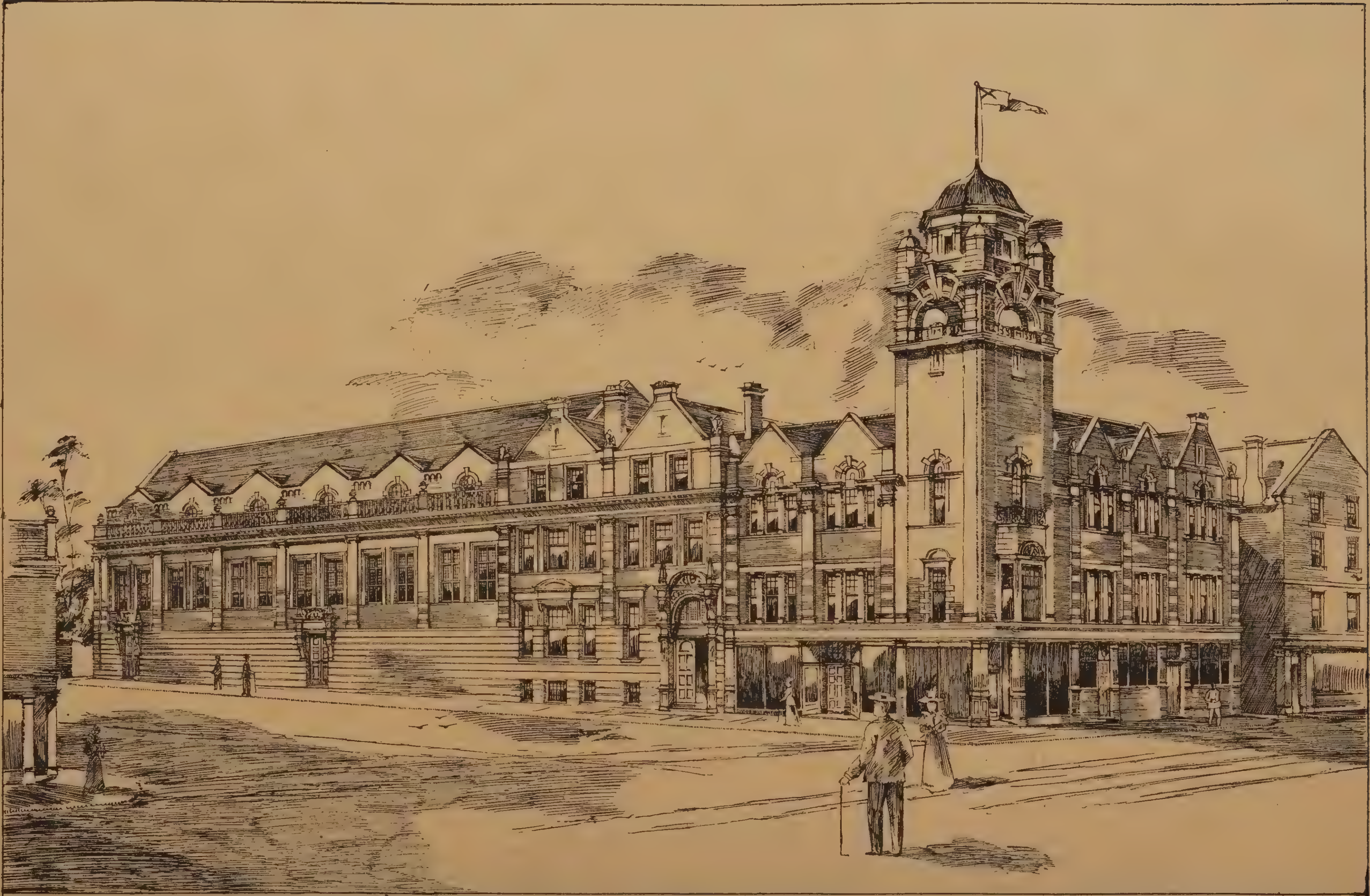

:Royal Assembly Hall Buildings, South Shields:——:F.M.Laing Esqre J.H.Morton, F.R.I.B.A., Architect:—:

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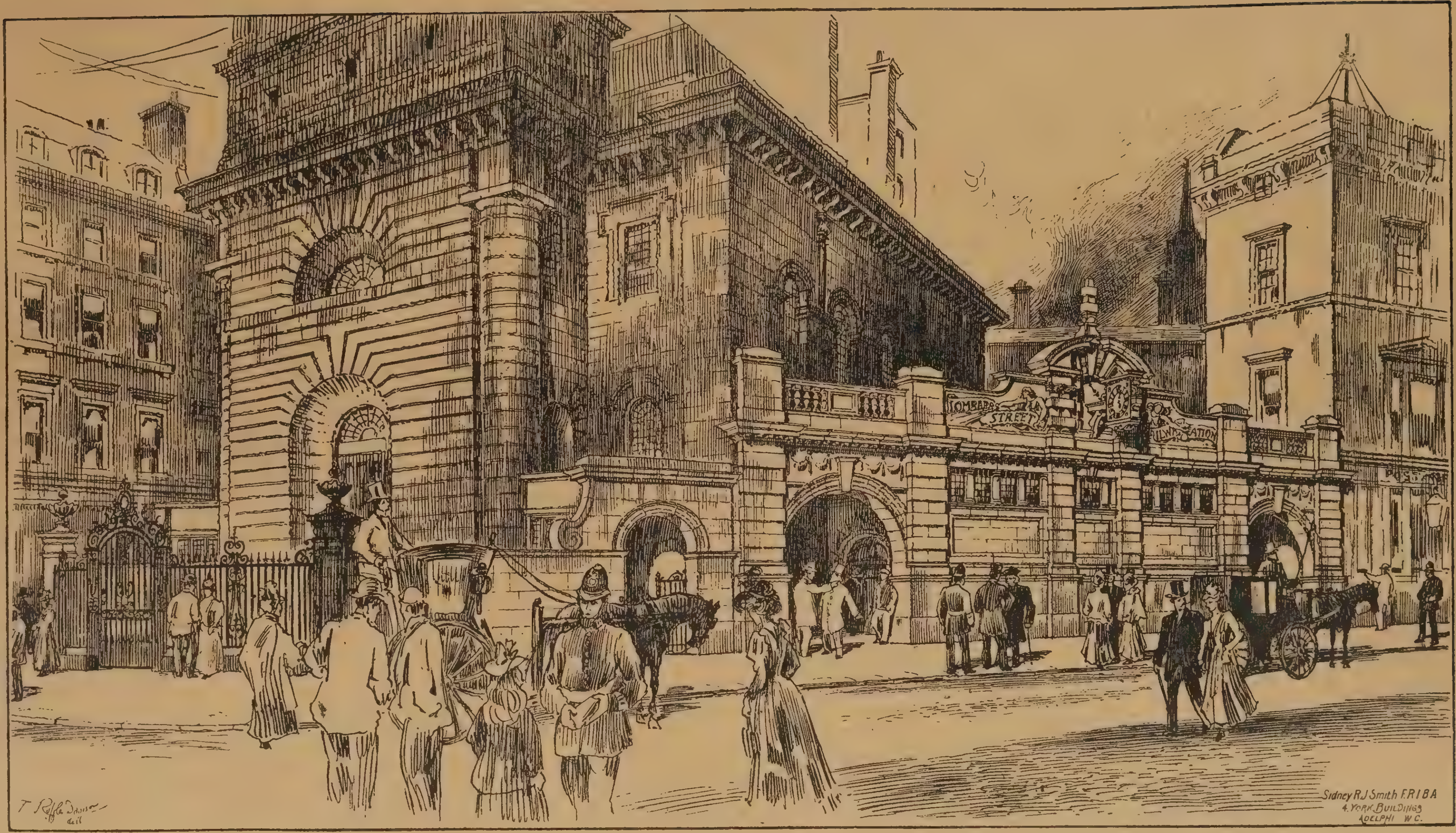

CITY AND SOUTH LONDON RAILWAY STATION, LOMBARD STREET, E.C. SIDNEY R. J. SMITH, ARCHITECT.

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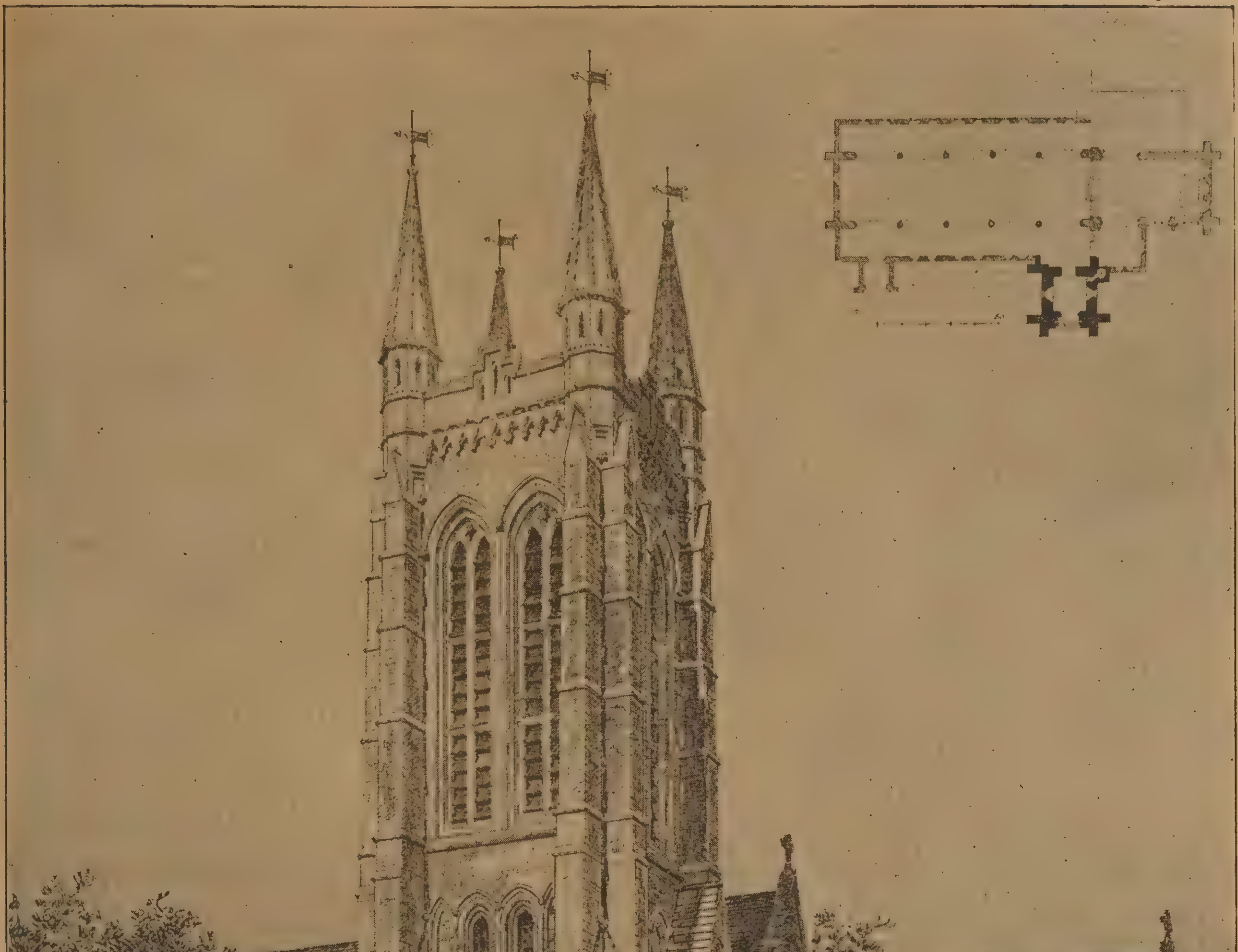

S:MICHAEL'S CHURCH:BOURNEMOUTH:PROPOSED TOWER:

J. Oldrid Scott, Architect.

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AN IDEAL CITY MADE PRACTICABLE.

A CHAT WITH THE AUTHOR OF THE SCHEME.

A FEW weeks ago we called attention to a scheme which has lately been given to the world, through the medium of a little book by Mr. Ebenezer Howard,* for the establishment of ideal communities, or, we should say, perhaps, of communities which approach more nearly to the ideal than any at present existent amongst us. Briefly the proposal is that a city should be built in some agricultural district in England where the most approved methods of building, engineering, and sanitation should be adopted, and where all the inhabitants should live under the healthiest conditions possible. If towns and villages can be started by single individuals or manufacturing firms—such as Pullman, Sir Titus Salt, and Lever Brothers—a body of manufacturers acting together, it was argued, could secure the same ends more easily and with the hope of establishing far more desirable conditions of existence. Such, very baldly stated, is the proposal which is set forth in great detail in the pages of "To-morrow," a book which is to be regarded by no means in the light of a speculative essay, after the manner of More's "Utopia," or Edward Bellamy's "Looking Backward," but as a practical contribution to the solution of a serious and pressing problem.

The first attitude of the average man on being confronted with a new project for the amelioration of what seems to be a firmly established state of society, is one of amused, or perhaps contemptuous, scepticism. After a while he is apt to approach the proposal in a spirit of inquiry, and with a willingness to weigh the pros and cons. of the subject. Assuming that many of our readers have now reached the questioning stage with respect to Mr. Howard's scheme and the methods by which he and his fellow-workers of the Garden City Association seek to put it into practice, we recently sought an interview with him in order to put before our readers some further information on the subject.

One cannot talk to Mr. Howard for many minutes without clearly perceiving that he is no mere visionary enthusiast. Enthusiasm indeed he has, as every reformer must have, but it is enthusiasm of the serviceable, business-like order. Mr. Howard shows no desire to get away from the actualities of things; he recognises difficulties, and meets, without trying to evade, them.

A few points only from a lengthy conversation can be touched on here. We asked Mr. Howard about the name "Garden City" with which he has designated the imaginary city he hopes one day to see actualised.

"The name," he said, "suggests one of the important features of the proposed city. Just as a well-ordered house has a garden attached to it and plants and flowers within it, so should a city have an area of open country closely surrounding it, and easily accessible to all its inhabitants, as well as ample parks and gardens within its boundaries. In the plan of a section of the city that has been prepared (and is here reproduced) it will be seen that ample provision is made for open spaces. This diagram, of course, is merely a suggestion. A circular plan, with public buildings at the centre and factories at the outer rim, seems to present several advantages, but it is by no means an essential feature of the scheme."

"What about the ownership of the land in Garden City. The idea would be to eliminate the private landlord, would it not?"

"Yes, but by purchase, not by confiscation. The landlord would be paid the full value for the land upon which the city is to be built, and we should endeavour to attract people by ensuring them the full increment of value which would necessarily spring from the growth of the city. The community would be the landlord, and would impose only such rents as would be required to pay the interest on the purchase money, provide a sinking fund, and carry on such public services as are elsewhere maintained by rates."

"There will be no private freeholders, then, in Garden City?"

"No. But we hope to convince people that a lease under the conditions offered is better than a freehold under ordinary conditions. The leases will be practically perpetual, so that there will be no reversion of the property. What is more common than for the owner of a freehold house to find that the value of his freehold is diminished by a factory being started near, or a row of shops, or by some other freeholder putting up immense hoardings to prevent the acquirement of 'ancient lights'? A leaseholder in Garden City would be free from these disabilities. The rates are thrown on his land, but they are taken off his house."

"I wish I could get the public to grasp," continued Mr. Howard, "that a raw piece of land, practically unbuilt upon, in a healthy country, not far from a railway (even this may be built), may often be made most suitable for settlement because it is like a clean sheet of paper on which you can draw."

"It is desirable, no doubt, assuming that you draw properly."

"Quite so," assented Mr. Howard, "but the possibility is there. And it is, perhaps, because of the magnitude of the possibility, because of the glamour surrounding the building of a new town from the very beginning that people are afraid it cannot be a practical idea. That there are difficulties, is admitted, but they are not difficulties inherent in the subject itself. No law of nature is violated by an experiment of this kind."

"The work of the Garden City Association, I understand, is for the present chiefly propogandist. Will you please tell me just how—when the educative process is fairly complete and a sufficiently numerous body of the public have assimilated the idea—it would be proposed to make a practical start?"

"Manufacturers now," replied Mr. Howard, "often find it convenient to migrate from London and other great cities. What then could be more natural than that a number of manufacturers should combine together and migrate in company? A number together could secure advantages, alike for themselves and for their work-people, impossible for one alone. It is by such a concerted movement of manufacturers in sympathy with the ideal of a garden city that we hope the first of these cities will be started."

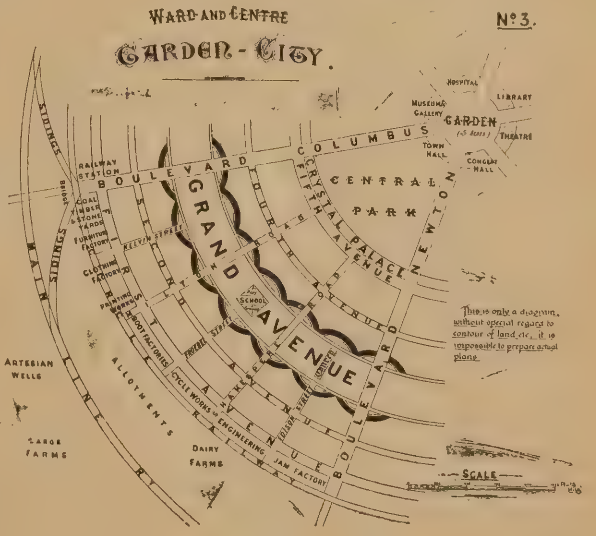
"Supposing the experiment succeeded to such an extent that people were attracted in great numbers, how would you prevent the city growing beyond the modest dimensions which you suggest as desirable?"

"Let me answer that by referring to existing conditions in London. No one would advocate building on Hyde Park or Regent's Park. Yet each of these parks might be said to be a barrier against growth: though they do, in fact, but prevent a mode of growth which, but for them, would be disastrous. But there is a far better illustration, if we go to South Adelaide. That city has adopted—though not on quite so generous a scale—the very system I advocate. The city of South Adelaide is surrounded by 'park lands,' as they are termed, of greater extent than the city itself, which, having been built up within this park enclosure, grows by leaping over its park lands and by spreading out into North Adelaide. Now I contend that the inhabitants of a whole group of towns, if they are not too remote, and if adequate facilities of transit are provided, may be more truly members of one community than are the inhabitants of, say, a western and an eastern suburb of London. Of course, the question whether the 'park lands' around Garden City should be in any measure built upon, or whether they should continue to be used mainly for agricultural purposes, would be decided by the community itself; but I think it is safe to conclude that a community, called into existence by the evils of overcrowding, is not likely to act in such a way as to cause a recurrence of the same calamity."

There is one point about this scheme which should not be lost sight of. It is not the project of a sect or clique, but appeals equally to people of all creeds and parties. This fact was curiously brought out as Mr. Howard mentioned the names of people who have already joined the association. While the membership includes some who are avowed socialists, it contains at least one member of The Liberty and Property Defence League.

"I would call my system," said Mr. Howard, "Social Individualism—individuals grouping themselves in a social manner. Of course nothing is cut and dried; a project like this leads people just as far as they desire to go in the direction of collective effort."

Mr. Howard pointed out the special attraction his scheme should have for architects and engineers, and with his remarks on this head we will conclude this *resumé* of the conversation. "Building on the lines suggested, or on the more suitable ones which discussion may evoke, or contours or natural surroundings may demand, would bring architecture up to a higher plane. Architects would no longer consider merely the small site on which they are erecting a building. They would take a larger view; they would consider the whole town, and group their buildings symmetrically and conveniently. They would be guided by the contour and natural features of the sites, and would seize upon some inequality of surface to introduce some beautiful effect. Thus there would be a congruity of design and beauty of proportion between the various buildings which is impossible under existing conditions. The establishment of garden cities would mean a renaissance of architecture. So in regard to engineering, there are great advantages in working on a blank sheet. No water engineer, so far as I know, has studied a large tract of bare land and endeavoured to consider how far it could supply the needs of a people for water, with all its varied purposes of utility and beauty—a people who have not yet come there, but whom it is intended to attract by (among other things) a well-devised system of water supply. Systems of water supply are not provided until the needs of the people have actually arisen or become urgent, and by this time there are usually numerous hindrances to anything like a truly scientific system. Greater foresight will lead to marvellous results in this and many other directions."



The work of familiarising the public with the principles of the Garden City Association is being actively proceeded with, and a number of committees have been formed with definite special objects. A public meeting in furtherance of the objects of the association is announced to be held at the Memorial Hall, Farringdon Street to-morrow, October 26th, at seven o'clock, Mr. T. H. W. Idris, L.C.C., in the chair. Meanwhile, any of our readers who may wish for further details of the scheme can obtain them from the hon. secretary of the association, Mr. F. W. Steere, 4, Stone Buildings, Lincoln's Inn, London.

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* "To-morrow: A Peaceful Path to Real Reform." By E. Howard. London: Swan Sonnenschein and Co., Ltd. 2s. 6d.

ARCHITECTURAL ASSOCIATION OF IRELAND.

INAUGURAL ADDRESS.

THE opening meeting of this Association (the session for 1899-1900) was held in the Grosvenor Hotel, Dublin, on October 17th, when Mr. G. P. Sheridan, A.R.I.B.A., delivered his inaugural address, of which the following is a *resumé*:—It is unnecessary that you should be wearied with many retrospective references. We are a youthful association, being but three years in existence, but our past, short as it is, can be summed up in one word—success. We may fairly claim to have done good work, and to have aroused amongst the younger members an enthusiasm which, I think, has never previously been understood in Dublin.

But, gentlemen, my duty to-night is not so much to dwell on the past, as to consider how best to direct our conduct in providing for the near future, and encouraging an earnestness, in mutual assistance, towards that improvement, which is calculated to best help us in expressing the nobler aspirations of the age in creations of the true and beautiful, and which may be a benefit and a pleasure to our fellow men.

The success of the association as an educational body depends on the individual volition of the members. I need hardly refer to the importance of attendance at the classes. Perhaps of all the classes the sketching and measuring class is the most important. We all know sketching is inseparable from an architect's education—how it trains the eye in proportion and judgment, concentrates the attention on detail, and assists the mind in understanding and recording the effects produced in deceased architecture. I exhort you to practice it when and where you can, and it is astonishing what proficiency may be arrived at by a little persistent work. Endeavour to be accurate, take pains, and stick to it. There are perhaps many benefits to be derived from a system of architectural education—supplemental to office work—and well suited to assist in an effective training of the hand and mind. But an advantage I place above these and which these must lead up to is the development of a mental condition which seeks to investigate what architecture is, and endeavours to understand why certain forms are beautiful, and why varied emotions are excited in the contemplation of different buildings. In order that an architect might be able to create an architectural composition to give pleasure to those who shall behold his work, it is well he should have knowledge of some of the causes which influence appreciation. Architecture depends a great deal for its attribute of beauty in the manner in which it occupies space, and it is not dependent on ornamentation, and, consequently, I believe architectural beauty for the most part consists in the due proportion observable in the outline of a building and its several parts. Colour, to a certain extent, adds beauty to architectural works, but in order that it should do so it must, I think, have the character of necessity, and not of having been adopted for the sake of ornament alone. Contrast a red brick building with one that is painted brick colour. The knowledge of the nature of materials and their adaptability to the uses for which they are employed also influences ideas of beauty. The history of architecture in its archæological sense is a history of the progress of man's knowledge of the use and nature of building materials.

And the qualifications of the materials in any country to some extent explain the peculiar characteristics of its architecture. Again, I think, a building to be beautiful must give us the idea that it is able to withstand the injurious agencies of Nature, which are always tending to destroy it. It should appear stable and not top-heavy, and that material which appears the most lasting to some extent affects the mental condition forming ideas of beauty. The emotion of the sublime may be excited by the size of the building. If of great height the feeling may be that of fear of the pile falling, but this feeling might be caused by a somewhat similar condition in nature as by a high perpendicular cliff. But the emotion of sublimity, produced by buildings of architectural merit, arises when we reflectively connect their existence to the mind that conceives them, and to the mental effort of guiding the progress of the work. The difficulty with which we know an architectural work to have been accomplished, perhaps, adds still more to the emotion of the sublime. A certain amount of recurrence of the same effect in a building gives us an idea of sublimity, because it suggests the whole edifice is the effect of one single conception in the architect's mind. Beauty in effect is added to a building when it expresses the uses for which it was erected.

These are some of the ideas and forces that influence the mind when seeking for sublimity and beauty in work embodying architectural aspirations. And I may add that simplicity, when used as a means of obtaining a successful effect in architecture, always lends dignity to beauty. Similarly, truthfulness in construction, when expressed with simplicity and unobtrusiveness, is associated with beauty.

> How much more beautiful doth beauty seem
> By that sweet ornament which truth doth give.

Why should we not make the graceful couplet the banner under which our association could advance in its work of education and reform? It would influence our conduct, and, perhaps, at times, be as a protecting Aegis against the onslaughts of a dictatorial client. Ah! the client! He is the man that pays and knows what he wants! He must be pleased! And when we try and please him we probably shall fail. When we give richness he says we are vulgar, and when we endeavour to express the wants with simplicity, he insists that our work is poor. Well, perhaps he is right. He looks at things with a different eye from what we do. He influences the direction of architectural change, and may stamp the spirit of the age on the buildings rising around us. No! the architect should be the interpreter of expression, and he should reign supreme in the realm of architecture.

Each generation has not the same knowledge nor desires as the preceding one, and each age has its special good points and its special character stamping the architecture of the period with the general aspirations of the community. We are always changing, always moving onward, and the architectural judgement is likewise influenced.

In this very practical and material age, the fine arts are considered as something apart and not as an embodiment of the public mind as in epochs past. And it is difficult to say in how far the work of to-day repeats, architecturally, the aspirations and characteristics of the time we live in. In this restless age, when the spirit of keen competition creates a feverish desire for change and novelty, it is very difficult to point in what direction the tendencies of to-day appear to be drifting. But perhaps I may not be far astray in suggesting that a "studied simplicity" is apparent in the "motifs" of modern life. I think it can be traced through the different phases and conventionalities of our every-day existence. Persons assume a virtue, if they have it not, in simplicity of manner and address, and decry the extravagances of a former generation. They will reject with affected disgust the ornate and massive, and display a ready preference for the opposite though it borders on the crude. It peeps out in our social relations, and even in the fashions affected by the fair sex we see an attempt at this "studied simplicity." I have called it a "studied" simplicity because the adjective stamps it as spurious. It lacks the grace of refinement, of true and unconscious simplicity and the dignity and breadth of restraint. And modern architecture, taken *en masse*, is beginning to express in material form this spurious simplicity. I might even go farther and say that, as the result of this tendency, a cult in architecture has developed which might be described as the "cult of crudity." It is certainly untrammelled architecture, as all sorts of liberties are indulged in and departures made from what has been considered orthodox. Academic architecture is left severely alone, and the gradual development of centuries methodically ignored. And all this is to be accounted for by the effort of the everyday architect to appear in his work as a man possessed of superior knowledge, and to suggest that he could do a great deal more if he tried, or show his independence of precedent by endeavouring to gain a commanding effect—by a "studied" simplicity in composition, supplemented by a crudity in detail, almost unparalleled in the history of our art.

Great wall surfaces without any counterbalancing and contrasting features are thrust at us, or perhaps a strip of sculpture is crudely planted on which has no meaning in the unity of composition. Entablatures are distorted and the parts perhaps interchanged in a way calculated to make you reflective, if not sad. Columns are attenuated and appear without a base, or are finished with a sickly mould in lieu of a cap—or, again, are distorted with an apalling entasis associated with an ill-used bolster, and perhaps are ladened with rustications to such a pronounced effect as to present the appearance of a scarified salmon.

Instances might be multiplied if time permitted, but I must not pass on without letting you understand my references are only in a general sense. Excellent work is done now, and which may well be said embodies the true and beautiful in a way which demands our admiration, and in which departures are made from proportions which for generations had been accepted as fundamental in good design, and in which originality is not defined so much by novelty as by a modified adaptation of precedent, carrying with it respect for that which has gone before. Simplicity with the authors of these works meant repose, and unity, and restraint, and truth; they introduced ornament where ornament spoke to you most, or omitted it where truth could best be expressed without it.

These men are working up to high ideals. They make the sciences subservient to the principles of design and expression; they are not afraid to accept the advantages which science empowers them with, as they understand it is only knowledge which can be viewed and considered architectually. They consulted the past for suggestion, and understood the feelings which move the early architects who, as Smiles in his book on "Duty" says: "Put their Spirit into their work; they put religion into their work. Their architecture had life, and truth and love and joy in it. It was chiselled music."

A New Hall to Hope Street Church, Liverpool, has been built from the designs of Mr. James Rhind by Messrs. Haigh and Co. It accommodates 200 persons.

A New Chapel at Shirebrook, near Mansfield, is about to be erected from designs by Mr. J. Perkin, architect, of Shirebrook and Leeds.

Fall from the Apperley Bridge Viaduct.—A shocking accident occurred on October 18th at the extension works on the Midland Railway between Thackley and Apperley Bridge. A joiner named William Newins was engaged in some scaffolding which is almost on a level with the nine-arch viaduct spanning the river, when he overbalanced and fell to the ground below. He alighted on a heap of bricks, and was picked up in an unconscious condition.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

SPRING FLOOR FOR DANCING.

To the Editor of The Builders' Journal.

Westminster, S.W.

Sir,—I should feel obliged for any practical information on this subject, or where particulars could be obtained.—Yours truly,

QUERIST.

Information on this subject will be found in the part of an article on "Practical Carpentry and Joinery," by Mr. Geo. Ellis, appearing in The Builders' Journal and Architectural Record for January 26th, 1898.

APPOINTMENTS IN THE CIVIL SERVICE.

To the Editor of The Builders' Journal.

Lowestoft.

Sir,—Will you kindly inform me through your valuable paper, The Builders' Journal, where to apply for particulars of appointments under the Civil Service, and oblige,—Yours &c.,

E. H.

There are many books published giving particulars of how to obtain appointments in the Civil Service—the local bookseller would get one for you. We shall publish, in the course of a week or so, an article on technical appointments, which will no doubt be useful.

CLEANING BRICKS.

To the Editor of The Builders' Journal.

Belfast.

Sir,—I should be glad if you could give me a recipe for cleaning Aston Hall buff bricks that have become dirtied by mud.—Yours faithfully,

R. H.

A good brushing with a stiff bass dandy or steel wire "trimming" brush, followed by a scouring with a similar brush, may, perhaps, be sufficient to remove the discolouration of the face of the dirtied brickwork; but, if not, the application of a solution of *white* copperas in water-strength, according to tone required, should be tried. If necessary a little ochre may be added to the copperas solution, and sample coatings should be made before any general application of the solution is indulged in.

H. E.

DYE AND COLOUR MAKERS.

To the Editor of The Builders' Journal.

Blackhill.

Sir,—I shall be greatly obliged if you can furnish me with the address of a firm or agents who make aniline dyes or transparent colours (water) for decorative purposes. They will need to be of extra strength, depth, and purity in working. Ordinary water colours are too weak and not sufficiently transparent for the required purpose.—Yours faithfully,

ETRUSCAN.

The following are makers of, or agents for, aniline colours: Brooke, Simpson and Spiller, Ltd., 10, New Broad Street, London, E.C.; Henmann, Keller, and Co., 102, Fenchurch Street, E.C.; Levinstein and Sons, 24, Railway Approach, S.E.; Wilkins, Campbell and Co., 242, York Road, N.; Zerenner and Co., 53, New Broad Street, E.C.; J. D. Wilson, West End Works, Richmond Road, Bradford.

GARDEN WALL BOND.

To the Editor of The Builders' Journal.

Sevenoaks.

Sir,—I note that in the portion of the exceedingly useful Model Answers to the Society of Architect's Examination Papers appearing on page 134 of No. CCXLIII., it is stated that Garden Wall Bond consists of three courses of stretchers and one of headers alternately. But Mr. C. Mitchell, in his book on "Building Construction," says that Garden Wall Bond is "three stretchers and one header in the *same course* constantly recurring." I should be glad if you would inform me which is the correct method.—Yours truly,

I. T.

Both methods are correct, though the method which I. T. quotes is perhaps the most usual. The bonding we gave in our answers (three courses of stretchers to one of headers) is generally called English Garden Wall Bond; the other (three stretchers to one header in each course) is known as Flemish Garden Wall Bond.

MIDDLETON and CARDEN.

BOOKS ON HALF TIMBER WORK.

To the Editor of The Builders' Journal.

Leeds.

Sir,—Will you kindly supply me with particulars of some good books on half timbered construction. Please also give the numbers of The Builders' Journal containing articles on this subject.—Yours truly,

STUDENT.

No work has been published that deals comprehensively with half timber work from a constructional point of view. Some plates of details are in the third volume of the "Abbey Square Sketch Book" (£3 3s., B. T. Batsford, 94, High Holborn, W.C.). There is also a small chapter on the subject in "Mitchell's Advanced Building Construction" (4s. 6d., Batsford). Articles dealing with half timber work have appeared in Nos. 54 and 55 (February, 1896), Nos. 144 and 150 (December, 1897), No. 227 (June, 1899) and No. 236 (August, 1899) of The Builders' Journal.

RIDDING A HOUSE OF RED ANTS.

To the Editor of The Builders' Journal.

London, W.

Sir,—At the present season, many of the houses in London which are built on a sandy soil, have the basements infested with swarms of small, red ants. Everything that is brought to table is covered with them to such an extent, that a positive nuisance results. Can you suggest any method of exterminating them, or greatly reducing their numbers?—Yours faithfully,

ROWLAND PLUMBE.

The long continued drought of the past summer has been especially favourable to the propagation of insect life, and especially in the case of newly-built houses; it has been no uncommon thing for insect pests of all kinds to have established themselves indoors, or, what practically amounts to the same thing, to have made continual raids on the house in foraging expeditions. Ridding a house of ants is usually a somewhat troublesome affair if the job is to be thoroughly done, which it must be if the "ridding" is to be effectual. The presence of ants in the region of the larder is no evidence that a colony is established indoors, although it is quite possible that, if the trouble has only recently arisen, the ants may have been driven by wet weather to establish themselves under cover. Their nests are most frequently situate at a considerable distance from the place where they are found congregating on plunder bent, and it generally needs a little patient tracking to find which point of the premises serves as ingress and egress, and, this having been found, to further follow the trail to the nest. The writer, some seven years ago, was similarly plagued, and a patient tracking of the ants through half the ground-floor premises revealed the fact that the exit hole was a crack by the cemented hearth to the kitchen fireplace, within a yard or so of the larder. The expenditure of some quarter of a pint of paraffin oil in and around the crack (in default of being able to locate the nest) proved a perfect cure, once and for all. When the nest can be located, it and its contents may be destroyed by the application of boiling water. When the nests are inaccessible, or when from any cause the trail cannot be followed, anything that will render the road travelled unsavoury will act as a deterrent, and chloride of lime, sulphur, carbolic powder, Keating's insect powder, paraffin-moistened sand, and even dry slaked lime, freely scattered about where ants abound, will ofttimes cause them to stampede in a tremendous hurry. But it may not always be convenient to employ these means, in which case traps or poison may be resorted to. Bones with a little meat left thereon, or a sponge moistened with honey (preferable) or treacle, will serve as baits, and these can be dipped into boiling water as often as they are found infested. Honey, or treacle, in a saucer, to which some Paris green (arsenical) has been added; finely granulated or caster sugar damped with arsenious acid; similar sugar mixed with calomel, two to one; and phosphor paste spread on white paper and dredged with sugar, are poisonous preparations which will destroy ants.

H. E.

CONSTRUCTING DELICATE PISTONS.

To the Editor of The Builders' Journal.

Kendall.

Sir,—Will you kindly reply to the following query:—A. on the enclosed sketch (not reproduced) is a cistern nearly filled with water. B. is a centre barrel or cylinder 4in. in diameter, open at each end. C. is a plunger or bucket. The barrel is fixed in the cylinder so that it does not touch the bottom. Is it possible to get a plunger or bucket that will work easily up and down in the barrel, and yet prevent water getting above it? I want the plunger to fall down by its own weight, and yet be as light as possible. If this can be done, would you kindly state of what materials the barrel and plunger should be made, and what weight and size the plunger should be. The great object is to have a light watertight plunger (or one practically so) which will fall by its own weight. The cistern is not filled or covered, so that water can rise without resistance. I think your paper is a most interesting and instructive one.—Yours faithfully,

IGNORANT.

The barrel and plunger should be made of copper or brass. For a simple surface guage or indicator, a hollow metal float, working loosely within the barrel, would suffice. If the circumstances necessitate the provision of a packing box or ring to the floating plunger or piston, a specially made cupped leather, properly secured near the underside of the plunger, might meet the case. Another alternative would be to insert a light and flexible ∩-shaped packing ring within a suitable groove arranged round the external diameter of the hollow and buoyant piston. Any upward pressure of the water beneath the plunger would then force the outer edge of the cupped leather or packing ring against the side of the barrel. The details for a sensitive fitting of this description must necessarily depend upon the purpose for which it is intended. A first-class firm of engineers and mechanics would probably undertake to construct a barrel and plunger adapted to your particular requirements.

T. E. C.

The Architects and Civil Engineers of Italy number 3,487, and have a united income of £181,922; this gives an average income of about £52 15s. One reports his income as varying from £600 to £800, three declare theirs to be between £400 and £600, 1,634 have incomes between £40 and £400, while the remainder—1,849—are earning less than £40 a year.

Glasgow Institute of Architects.—The newly-elected council of this institute held their first meeting on Saturday, when the following office-bearers were elected, viz.: President, Mr. David Barclay; vice-president, M. Alex. Petrie; auditor, Mr. W. Forrest Salmon; secretary and treasurer, Mr. C. J. MacLean, 115, St. Vincent Street. The various committees for the year were appointed including committees on architectural education, public architecture, and building regulations.

Bricks and Mortar.

Aphorism for the Week.

"One may make the house a palace of sham or he can make it a home—a refuge."—Mark Twain.

St. Paul's as it might have been. Archdeacon Sinclair has lately been lamenting that Wren's scheme for having a spacious churchyard around the Cathedral, surrounded by a colonade, was frustrated. This is what he says: "Wren never meant the Cathedral to be hemmed in by warehouses, but the people who held the land began rebuilding after the Fire before Sir Christopher could carry out his scheme. He wanted to have a magnificent, wide street leading direct from the West Front of St. Paul's to Westminster, or at least to Charing Cross. The view of the Cathedral is spoilt by the narrowness of Ludgate Hill. Still, it is better than it was before the widening of Fleet Street. I don't think that if St. Paul's Cathedral were in any other European city the people would allow it to be hemmed in by warehouses and shops."

Excavations at Ephesus. By many travellers in the Levant, Ephesus is regarded as an uninteresting place, but the Austrian excavators there have altered matters, and features of the greatest interest have been brought to light. Mr. F. R. C. Hutton, writing from Ayasoloak, says that the great theatre has been excavated. The whole of the columns of the proscenium and the passage and ante-rooms with mosaic pavements have been opened up, and the work is going on still in the upper portions of the theatre. In front is the street with the marks of the chariot wheels all along the pavements. There are also the whole series of buildings behind and underneath the gymnasium, including some lovely marble water-troughs, with oxen and oak wreaths and some fine marble doorways, all *in situ*. But perhaps the most interesting thing is that which is now being excavated—the lovely semicircular marble portico with its steps, which occupied the whole east side of the harbour. What there is now is most beautiful and interesting, and each week discloses something new. Perhaps to Christians there is the most interesting thought that St. Paul landed at these steps. Mr. Hutton's information is exceedingly interesting, as art, in entirety, must benefit by the unearthing of buildings erected by the great architects of the most remarkable period in the world's history.

A Boon to Craftsmen. As those who have tried will testify, it is often a most troublesome task to find a technical book in a general catalogue, and the reform inaugurated by the chief librarian to the Corporation of Liverpool, Mr. Peter Cowell, is therefore highly commendable. He has, to a certain extent, got out special catalogues for art students and craftsmen, and has so planned them that one can see at a glance the amount of information that the Liverpool reference library has to offer on architecture, the decorative arts, building construction, and similar subjects. The full library catalogue is too bulky to be used anywhere but in the building by those who consult it for such educational purposes, so that these new sectional catalogues will greatly add to the utility of the library, and be of great help to searchers. The Liverpool collection has a specially good lot of books on architecture, and this new departure seems to have been suggested by the needs of the new architectural school.

The Limits of Technique. Mr. Brownell says in "Scribner's" that current art is certainly concentrated upon physical character rather than upon beauty, and current appreciation of it is in harmonious accord with its realistic effort and aim. One may refine speculation to the point of asserting that there is no opposition, essentially considered, between the two; that Rembrandt is as distinguished for his beauty as Raphael, and that, on the other hand, there is as much character in "The School of Athens" as in the "Lesson in Anatomy." But in matters of this kind terms are approximate only, and the fact that definition is a difficult matter does not obscure the plain truth that a marked difference exists between the work of a painter in whose mind an agreeable conception of an object mirrors itself, and that of one mainly anxious to be exact. Technique has spread prodigiously (quite as much, perhaps, as it has developed) in the present epoch, and has become rather arrogant in its aggrandisement. Criticism, too, in becoming largely technical, has assisted the tendency, so far as it exerts an influence on practice. It has grown tired, no doubt, of its own common places and generalities, its easy habit of estimating aims rather than accomplishment, its routine insensitiveness to aspect and perfunctory absorption in significance. But in assuming the painter's point of view—not a very esoteric one, certainly—it has not been quite self-respectfully discriminating enough to avoid the purely professional attitude. And it is perhaps time for the pendulum to swing back again a little, so that both in estimating and in enjoying the painter's art we may once more think of its intellectual rather than so wholly of its mechanical side, which latter we may also be sure, nowadays, will be quite carefully, and in many cases competently, attended to by the painters themselves. Mr. Brownell's remarks deserve the attention of all those who, following the course of modern methods and opinions, have a tendency to become too prosaic and mechanical.

More Fire Tests. Since the foundation of the British Fire Prevention Committee, after the Cripplegate fire of November, 1897, a great many interesting and useful tests have been carried out at the Committee's premises at the side of the Regent's Park canal. A private view was given last Wednesday on the occasion of the opening of the winter session, when tests were made with a 5in. floor built of steel girders and breeze concrete (as recently classified by the L.C.C. as fire-resisting), an iron safe containing papers, and two wooden doors. The floor test was to have been of two hours and a half duration, but the floor collapsed in about an hour and a half, the maximum temperature reached being 1740deg. The safe bulged badly, and could not be opened at the close of the test to examine its contents. The most interesting tests was with the doors, one of which was of 2in. deal, and the other of 2in. pitch pine; both were solid. The fire began to break through after about fifteen minutes, and, though at the commencement it looked as if the deal door would go first, this proved otherwise, for it stood slightly longer than the pitch pine door, which collapsed after fifty minutes. The highest temperature recorded in this test was 1680deg. Mr. Edwin O. Sachs (chairman of the Executive) received the visitors, and there were also present Messrs. H. H. Collins, F.R.I.B.A., Frederick Farrow, F.R.I.B.A., and Mr. Emile Schweich. The tests were conducted by Messrs. Max Clarke, A.R.I.B.A., Charles E. Goad, C.E., F. Hammond, F.R.I.B.A., and Ellis Marsland.

St. Paul's Again. The much-harried dispute about the decoration of St. Paul's Cathedral was again brought up last Thursday, by a letter from the Dean being read before the meeting of the Court of Common Council at the Guildhall. A new reredos, he said, had been placed in the choir, and the east end adorned with three stained glass windows and two mosaics. The sides of the choir had been decorated with mosaics and the windows with stained glass. The four corners of the dome had been supplied with mosaics, a window in the south transept had been filled with stained glass, and another would be filled in the Spring. Mosaics had been placed in the roof of the north aisle of the choir. A peal of bells and a clock had also been recently added, and eight vacant niches in the dome had been filled with statues. The committee had raised and expended £150,000. Work which had been commenced should be completed. The statement that "this external work greatly added to the spiritual influence of the building" evoked cries of "Oh, oh." £50,000 more was needed to complete the work at St. Paul's, and the Dean said he would be very thankful if the Court would repeat their liberal gift. Mr. A. A. Wood said he viewed with great regret the form of the decoration adopted, and that the work was in the hands of persons who were so completely out of sympathy with the aim and object of Sir Christopher Wren. Much of the decoration had met with adverse criticism in art circles, and it was generally condemned by the public. That criticism had met with little, if any, attention on the part of those responsible for the work. Eventually, on an appeal by the Lord Mayor, the letter was referred to the Finance Committee. Many think that it would have been much better for the cathedral if the £200,000 to be spent in decorating it was devoted to some other purpose.

Rural Building Bye-Laws. A few weeks ago there appeared in our columns some particulars of the agitation created at Dartford, Eynsford, and Sutton-at-Hone about the restrictions imposed by the Local Government Board with regard to cottages, these being considered excessive and unfair. Shortly afterwards the Dartford Rural District Council held a meeting, when the question was thoroughly discussed, and on the proposition of the chairman the Council agreed that their opinion should be expressed to the Board on similar lines to that done by the authorities at Bromley, namely, that the cubic capacity should be increased to 9,000ft., the area to 900ft., and the minimum interspace reduced to 50ft.—it will be remembered that it was required that the cottages should be erected 200ft. apart. The Board have conceded to waive the stipulation that party walls should be carried up to the roof. As we have already pointed out, the existing bye-laws for rural districts need revision, in order that builders may afford to erect cottages for tenants who pay very little rent, and we hope that the present agitation will spread until the desired reforms have been effected.

The Lord Mayor's Mistake. At present thoughts of war occupy the mind to the almost total exclusion of all other thoughts—at least, this seems to be the case with the Lord Mayor of London. R.A. means Royal Academician, and it also stands for Royal Artillery. At the presentation to the Corporation of Mr. A. C. Gow's large picture of the Thanksgiving Service at St. Paul's, on the occasion of the Diamond Jubilee, the Lord Mayor, in reading the inscription on the picture, announced that the artist was Mr. A. C. Gow, "Royal Artillery." The mistake was greeted with bursts of laughter, which were renewed when the Lord Mayor went on to explain that the mistake was due to the events of the day and the meeting at the Guildhall on the previous Monday. Any excuse is better than none at all.

Mild Steel. The Glasgow and West of Scotland Technical College Architectural Craftsmen's Society held their opening meeting on Friday, the 13th inst., when Professor Gourlay presided. Professor Sexton gave an interesting lecture on the subject of "Mild Steel." He first sketched the evolution of man's habitations which had led to the necessity for, and the consequent invention of, mild steel. He showed how malleable iron was first used, then cast-iron, and after that steel, giving descriptions of their various good points and defects. He considered that Bessemer's invention of mild steel was one which would eventually revolutionise the structural industries, as it had done the engineering ones. He also described and contrasted Bessemer's, Siemens', and Bacic processes of production, giving the reasons for the adoption in certain places of one particular process. He considered the chief point in favour of the Siemens process lay in the fact that the amount of carbon could at any time be ascertained without delaying the process, and so allow for the specification on that point being exactly carried out. In conclusion, he referred to the evil of faulty specifications for mild steel work, and recommended that a certain percentage of carbon should be asked for, and tests made to see that it had been got.

An Example for the Restorer. The Society for the Protection of Ancient Buildings has just restored the dilapidated tower of Clare Church, Suffolk, and it is a good example of what restoration, in capable hands, is capable of. The inside rubble and flints were removed bit by bit and replaced by the best Portland cement and the same flints; while now and again bonds of the hardest Staffordshire blue bricks and tiles were inserted, leaving the outside wall just as it was 700 years ago. Viewing the renovated structure from the outside at the present moment, few would believe that the restoration had been completed, and that the tower had been practically rebuilt from the inside. It is a matter of satisfaction that a new strong tower—yet the old one with all its historic memories—will be handed down to posterity in all its ancient beauty.

Our Centre Plates. The construction of the City and South London Railway Co.'s new station in Lombard Street necessitated the underpinning of St. Mary, Woolnoth Church, and is an engineering feat of very great interest and skill. The church is at the angle of King William Street and Lombard Street, and faces the open space in front of the Mansion House. The building is in Portland stone, with granite base. A new screen wall, with entrance gates to the church, is carried along to the front of the west wall to hide the roofs of the entrances to the booking hall, which is under the roadway and the front entrance of the church, the waiting rooms and lifts being under the church itself. The lift shaft is 73ft. 6in. by 24ft., and has lifts each capable of holding 350 passengers. The lines are 100ft. below the street. The work of supporting the church has been done without the slighest damage to the structure, and no person would know from the inside of the church that any alterations had taken place. The carvings in the gables at the sides of the pediment represent electricity and commerce. The iron railings and gates in front of the church have been specially designed by the architect to suit the character and period of the church. The fittings inside the church will be replaced as they formerly existed, and the whole interior redecorated and lighted with electric light. Messrs. J. Mowlem and Co. were the contractors and Mr. Sidney R. J. Smith, F.R.I.B.A., is the architect.—The church of St. Michael, Bournemouth, was built some years ago from the designs of Mr. Norman Shaw, R.A. A tower was not then contemplated, but the need of one has been long felt, and Mr. J. Oldrid Scott was asked to prepare a design last year. The work was begun in due course, and the tower is now making good progress, and promises to be a conspicuous feature in the Poole Road, where the church is situated. The full height will be about 120ft., and the cost approaches £5,000. The design has received Mr. Shaw's full approval. The work is being admirably carried out by the contractors, Messrs. Bowman and Sons, of Stamford.—The Royal Assembly Hall Buildings, South Shields, are situated near the railway station, and comprise two hotels, range of shops, with offices over, and a large assembly hall that has seating accommodation for 2000 persons. The architect is Mr. J. H. Morton, F.R.I.B.A., of South Shields.—The houses on Lenton Boulevard, Nottingham, were built with red sand bricks, the roof is covered with red tiles, the windows are glazed with lead lights, and the exterior paint generally is white. The interior is fitted up in the general design of the period, which is indicated by the exterior work.

Correspondence.

MODEL ANSWERS TO EXAM. QUESTIONS.

To the Editor of The Builders' Journal.

Kirkcaldy.

Sir,—Referring to my letter in last week's issue and to your editorial note, my point is: that *model* answers to exam. questions should not only be unmistakably clear and concise, but complete; and should impress the examiner that the student has grasped the exact nature of the question set before him, *and should answer no more than is asked.*

I am aware that the authors suggest inverted arches, but why not stop there, instead of "beating about the bush" with all these doubtful apprehensions and indirect answers, when—at least to my mind—as I said before, the question seems sufficiently clear to judge the remedy hinted at?

D. FORBES SMITH, A.R.I.B.A.

[Unfortunately, examination questions are not always models of clearness, and we are still unable to see that our contributors could have dealt more usefully with the question set.—Ed.]

THE USES AND LIMITS OF PERSPECTIVE.

To the Editor of The Builders' Journal.

London, W.C.

Dear Sir,—There appeared on page 128 of No. CCXLIII of your journal an interesting article under the above heading, signed G.A.T.M., in which the writer comments rather slightingly on perspectives. "The note to be sounded in regard to perspectives is one of caution and distrust," he says. I don't think this is altogether warranted. Perspectives have been improving now for a number of years, and the "utterly false" type mentioned is fast disappearing before the efforts of such men as Mr. L. W. English, Raffles Davidson, and similar workers. Looking back at the class of perspective representations of, say, fifty years ago, one is soon convinced of this fact. The improvement also in the various processes of reproduction has increased the value of drawings, and it can now be expected that a delicate sky will receive satisfactory treatment. As to the uses of perspective, it is scarcely possible to dispense with the rough perspective sketch of first ideas for a proposed building. In preliminary sketches, a perspective view taken from the plan, and a rough sketch made by the architect, accompanied by a plan, would be preferable to plan and elevations, because geometrical drawings do not give so good or so correct a general idea of a design as a perspective drawing (which shows two elevations at the same time). Projections are lost in elevation even when shading is used.

Another and recognised use occurs when geometric drawings have been submitted for the first time to a client who is undecided whether to proceed with the work, abandon the idea, or defer the matter. A perspective sketch often brings things to a satisfactory climax, and the work proceeds. The sketch need not be expensive, as it will serve its purpose if only in pencil. Then there are competition perspectives. If the first two designs in a competition are of equal merit, but one has a perspective and the other has not, the former will invariably win; in fact, it is not safe to send in for competition without a perspective. Committees usually expect to see one, and such a view is generally included in the list of drawings to be sent in. I remember one competition committee recently required four perspectives, two interiors, two exteriors, and no elevations. This is a large and costly order, and one which considerably reduces the number of competitors. Perspectives are also used for exhibition purposes. Here the Royal Academy takes the lead. The fact that this institution exhibits a large number of perspectives every year shows that their "artistic merit" claims some attention. Perspectives, in fact, may be designs just as much as pictures with landscape or figure subjects. Exhibitions of this sort show the prevailing tendency in architectural style, but it is difficult to separate this class of drawings from the advertisement class.

Another important use is "in showing the designer where improvements could be effected." There are few who will not recognise demerits in a correctly set out perspective which would pass unobserved in a geometrical drawing. I have known architects of repute alter features and make additions to important buildings, in which case a good perspective has been desirable.

With regard to "wholly fanciful drawing of surrounding scenery," the better artists take very great pains to show the surroundings as correct as possible, which never fails to localise a drawing, and often makes it much more interesting. "Impossible points of view" are not very common, and generally occur where the streets are narrow. Intervening objects have often to be ignored in order to completely show the building. I admit that "cooked" perspectives are in every way despicable.—Yours truly,

C. HENZELL-ASCROFT.

New Patents.

The following abridged description is specially drawn up for The Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all Patent matters.*

6577. Roofing Tiles.—Patentee: S. Buck, of Osborne House, High Road, Loughton, Essex. In order to prevent the sagging of ridge tiles, they are formed with rabetted side edges, or a tongue of one tile enters a groove of the adjacent tile. The lower edges of the ridge tiles are grooved or recessed to engage with ribs or tongues at the upper edges of the tiles below.

6711. Stoves and Fireplaces.—Patentee: E. Taylor, of Blakey Moor, Blackburn. In the bottom of an open fire-grate is placed a block consisting of a number of slotted and perforated discs bolted together. The block serves as a fuel economiser, and allows air to circulate and ashes to pass through to the ash-pan.

593. Moulding Bricks.—Patentees: Blackman Ventilating Co., W. W. Wardle, and W. Tattersall, all of Fore Street, London, E.C. The cut bricks from the cutting-table of an extrusion machine are received by a number of boards connected by slotted links, so that the bricks are separated when the boards are pulled apart. The boards are mounted on V-shaped guide-rails that are slid transversely by a foot lever and toggle links in order to move the bricks clear of the cutting frame. The bricks are pushed by a board off the sections or boards on to a carrying-off board, and are carried to suitable drying chambers.

25,862. Doors, Shutters, &c.—Patentee: D. H. Ferguson, Board of Trade Building, Montreal, Canada. Asbestos fibre is mixed with silicate of soda into a pulp, which is moulded into halves of doors, with panels and rails. These sides or halves are dried and immersed in calcium chloride, or the like, to decompose the silicate of soda and cause it to set. After drying, the sides are cemented together. A modification for an outside door is illustrated in the drawings accompanying the specification. Distance pieces and strips are interposed between the sides, and the space between is filled in with asbestos fibres or other incombustible material. The locks and fittings are secured to solid filling pieces. Doors, wainscotting, &c., may be constructed of strips and sheets of asbestos millboard, treated with silicate of soda and calcium chloride.

Professional Practice.

Bristol.—A new stone reredos has been erected in Bristol Cathedral at a cost of £2,500, from designs by Mr. J. L. Pearson. It is about 17ft. wide and 27ft. high. The lower part behind and above the altar is plain, with a tall centre panel to enclose the altar cross, and on each side of the upper half of this panel is an enriched arcade of five divisions. The centre portion is corbelled boldly forward, and to the right and left there are enrichments from the floor upwards of traceried panelling, surmounted by niches with figures of Biblical saints. Above the level of the top of the corbelling the reredos contains niches, the central one having the Crucifixion, with Saint Mary and Saint John, well sculptured. The lower part of the back or eastern side of the reredos is richly panelled to a height of 14ft., and above this it is divided up by buttresses with niches. A panelled and traceried screen separates the eastern bay of the choir from its eastern chapel, flanking the reredos on either side. In front of the reredos stands an elaborate altar table of carved oak, surmounted by a marble slab, and approached by three steps.

Cambridge.—The new Presbyterian Theological College at Cambridge that was opened with enthusiasm on October 17th has been designed by Mr. Henry Hare, and has cost about £42,000. The site is at the junction of Queen's Road and Madingley Road, and the college, with the professors' houses and surrounding gardens, occupies about three acres of ground. Over the entrance gates are the dates 1844 and 1899, commemorating respectively the foundation of the college in London and its removal to Cambridge. The building consists of a central dome-capped block flanked by two wings. The central building contains the library, with space for 20,000 volumes, the lecture-rooms, offices, &c. In the west wing is the principal's lodge; in the east are rooms for twenty-five students and a resident tutor. In addition, two houses for professors are being erected to the north-west of the lodge. The foundation-stone of the new building was laid in May, 1897, and it has thus taken considerably over two years to erect. Like Mansfield, Westminster College will be one exclusively for theological students; but, unlike the Oxford foundation, it will be also a residential college.

Douglas.—The new town hall that has been erected from designs by Mr. Arthur Ardron, F.R.I.B.A., will have cost, when quite completed, about £12,500, but this amount does not include the furnishing. The contract for the building work was let to Messrs. W. Gradwell and Co., of Barrow-in-Furness, for £10,358. Local stone has been used for the outer walls, with Bath stone for dressings. The building is divided into three parts—the municipal offices, a free library, and a fire station—each part being complete in itself, but communicating internally to facilitate intercourse between the different departments. The main entrance to the municipal buildings in John Street is surmounted by a massive piece of ornamental work in Bath stone. The vestibule is guarded by a pair of wrought iron gates, designed and made by Jones and Willis, of London, and decorated in an effective manner in black and gold, each gate having a scroll bearing the three Legs of Man in gilt. The usual accommodation for the municipal offices is provided in this part of the building. The council chamber is 42ft. by 32ft., with a barrel ceiling panelled in fibrous plaster. All the woodwork is of Stettin oak. The library is heated throughout by low pressure hot-water pipes, fitted by Mr. W. F. Spencer, of Oldham, and ventilation is provided by Pickup's patent system with inlets in the lower walls for the fresh air, and outlets in the ceilings for the vitiated atmosphere. On the ground floor of the Fire Brigade section accommodation is provided for the fire appliances, above there is a large assembly room, and on the third storey are situated the caretaker's rooms.

Howth, Co. Dublin.—The new Roman Catholic Church of the Assumption, which was recently dedicated, is in the Romanesque style, and comprises nave, tower, two transepts with entrance porches, sanctuary, two side chapels, and sacristies. The nave is 85ft. long, and 32ft. 6in. wide; and each of the transepts is 18ft. in length, by 29ft. in width. The transepts on each side of the nave are divided from it by an arcade of deeply moulded arches, supported on columns of polished red Aberdeen granite, with carved caps and moulded bases. The nave is lighted by lancet windows on each side, and has a handsome circular window in the gable. The ceilings of the nave, transepts, and sanctuary are of Norfolk pine, and are divided into panels by moulded horizontal and vertical ribs. Four trusses support the apse roof. As to the exterior, the tower and spire when complete, will reach a height of 142ft., and will be surmounted by a cross. The sides are divided into bays by pilasters between the windows; and the porches have entrance doors with moulded arches, jambs, and labels over. The cut stone work is of Aughrim and Kilquiggan chiselled granite; and the walls have been executed in local stone, lined inside with Portmarnock brickwork. The stonework has been carried out by Mr. Wm. Lacy, of Howth. The materials for the roofing and other woodwork were supplied by Messrs. T. and C. Martin, Dublin. The plastering was done by Mr. W. J. Burke, Dublin, and the windows, with one exception, were supplied by Messrs. Martin and Sons, Stephen's Green. Mr. William B. Byrne, F.R.I.A.I., was the architect.

Leeds.—Among the many building improvements which are claiming attention in Leeds at the present time, the new Victoria Arcade in the centre of the city constitutes an important and attractive feature. It is arranged in the shape of a letter L, with entrances in Upperhead Row and Land's Lane, and provides for twenty-six shops, each with a show room overhead. A somewhat striking appearance is given to the buildings by a dome over the angle, where the arcade is at its widest. The footway is laid with Venetian Mosaic, and beneath is a subway containing the sewers, water-pipes, and electric lighting and gas mains. Four incandescent electric lights, each of 1,000 candle power, will serve to illuminate the arcade. The work has been performed by several contractors to the design of Messrs. Thomas Ambler and Son.

Thetford.—On October 18th the Reconstruction Committee of the Thetford Town Council met to finally consider the modified plans of Mr. Green, the architect, for the alterations to the Town Hall. After lengthy consideration they were passed, and it was decided to proceed with the work forthwith. The necessity of taking the old walls down has led to certain modifications being introduced, which will add considerably to the utility and appearance of the building. The floor of the large court will be raised 2ft., the approach from the market place will be by a flight of stone steps, with a porch at the top, supported upon stone columns, and the part of the basement which formerly consisted of a a number of small cells, will now be converted into a room 42ft. by 27ft. The last named can be used as a drill hall for the local volunteers. The Fire Brigade will have their quarters, as previously, in the west end of the building, and the mayor's parlour and the mechanics' institute will be preserved intact. In the large court, the floor space of which will be increased, the decoration will be improved by a handsomely carved ceiling. The council chamber will be above the Fire Brigade depôt, and there will be a passage from the large court under the gallery to the chamber. New magistrates' rooms, and improved kitchens and scullery, complete the list of the principal changes. The county court will be on the site of its predecessor, and will be surmounted at the centre by a clock tower with illuminated dials. The whole of the buildings will be carried out in white brick, with stone dressings.

Warwick.—Guy's Cliffe, near Warwick, the seat of the Right Hon. Lord Algernon Percy is situated a mile and a half along the celebrated high-road from Warwick to Kenilworth Castle. The mansion stands on the banks of the river Avon, and is surrounded by some of the most picturesque and beautiful scenery in the Midlands. It is of much historic and legendary interest. In the sixth century St. Dubritius built an oratory here, and the mythical exploits of Guy, Earl of Warwick, are interwoven with the history of the place. In later times Henry V. visited Guy's Cliffe and determined to establish a chantry, which was subsequently done by Richard Beauchamp, Earl of Warwick. An interesting theatrical romance is associated with Guy's Cliffe in connection with Sarah Kemble, afterwards known as Mrs. Siddons, the great tragedienne. A charming avenue of silver firs fronts the house, and the old Saxon mill, so much admired by artists (including Mr. Ruskin), is close by. The interior of the house contains a very good collection of pictures, many of them by celebrated painters. A new wing and extensive alterations have just been completed at the mansion, from designs by Messrs. Mark H. Judge and Sons, of 7, Pall Mall, London, W. The addition which has been made in the courtyard is built of Warwickshire stone, with Hollington stone dressings. On the ground floor a new entrance hall has been provided, with a unique fireplace carved out of the natural rock. Parquetry flooring in the various rooms has been laid by Messrs. Damman and Washer and Co., of Brussels; hot-water services have been fixed by Messrs. W. Boulting and Co., of London; passenger and luggage lifts by Messrs. R. Waygood and Co., of London; sanitary specialities by Messrs. J. Bolding and Sons, of London; and gas standards, pendants, &c., in hammered art metal, by Messrs. A. R. Dean, Ltd., of Birmingham. The clerk of works was Mr. Guy Wilfrid Hayler, and the contractors were Messrs. G. F. Smith and Sons, of Royal Leamington Spa.

Keystones.

The first Woman to secure the Royal Academy Gold Medal was Louisa Starr, now Madame Canziani.

The Works of James Maris form the chief feature at the exhibition now open at the Goupil Gallery, in Regent Street, W.

New Partnership.—A partnership has been arranged between Mr. Percy T. Remton, architect, of Hull, and Mr. W. S. Barry, architect, of Scarborough, which will be carried on under the style of Remton and Barry, at Hull and Scarborough.

A New Presbyterian Church at Limerick, the foundation stone of which was recently laid, is being erected from designs by Mr. G. C. Ashlin, of Dublin, at an estimated cost of £6,000. Messrs. J. Ryan and Sons, Limerick, are the builders.

Durham College of Science.—From the second annual report that has been sent to us we learn that Mr. M. Walton Brown has been re-elected president of the Durham College of Science Old Student's Union, and that there is a balance in hand of £14 13s. 10d.

The Smoke Nuisance in Paris.—A writer to a contemporary states that as so much coal is now consumed in Paris, not only statuary but public buildings are fast approaching the dinginess of those in London. This is especially noticeable at the Louvre.

The Roman Pavement at Dorchester.—At a meeting of the committee appointed to take steps for acquiring the splendid specimen of Roman pavement recently discovered at Dorchester, two schemes were brought forward—one for purchasing the pavement and adjoining houses at a cost of £1,500, the pavement to remain *in situ*, and the other to take up the pavement and relay it in the County Museum, at a total cost of £700. The latter received most favour, and it was decided to make an appeal to the county for the necessary funds.

A New Library at Hornsey, N., was opened on Saturday.

New Premises for the Blackpool Liberal Club have been built in Victoria Street at a cost of £8,500.

Mr. Arthur Evershed has been elected hon. treasurer, and Mr. Cloudesly Brereton secretary, of the Royal Society of Painter-Etchers and Engravers.

A Lady Sanitary Inspector is about to be appointed at Poplar, E. The Local Government Board have at last given their sanction to the proposal.

Mr. H. G. Watkins has taken over the honorary secretaryship of the Nottingham Architectural Society, in place of Mr. R. Evans, jun., the late hon. secretary.

Additions to the Royal Technical Institute, Salford.—Two additional rooms, for spinning and weaving, have been added to this institute and were opened on October 20th.

Church Bells have recently been the subject of several letters to the "Times," and the chief opinion expressed was that the only right way is to build the frames of iron fast into the walls.

Cost of the Paris Exhibition.—The French Government are spending four millions of money on the Exhibition, and foreign nations two millions. It is estimated that in all there will be about 150 million visitors.

A Generous Decision.—The City Corporation have decided to erect, at a cost of £10,669, a shelter in Golden Lane for the reception of families whose houses are being disinfected after outbreak of disease.

The Nelson Column in Trafalgar Square was attractively decorated last Saturday with floral wreaths and incandescent lamps. Messrs. J. W. Gray and Co., the steeplejacks, carried out the work of preparation.

A new chimney at Falkirk that has just been completed for the Falkirk Brewery Company is 200ft. high, and has a diameter of 17ft. for the first 70ft., and from that part tapers to 10ft. 6in. at the top.

Death of a Great Organ Builder.—The greatest of French organ builders, and one of the most distinguished members of his craft in the world, has recently died, at the age of eighty-eight. Aristide Cavaille-Coll built the organs at St. Denis, at Notre Dame, at the Madeleine, where Saint-Saens so long was organist; at the Trinite, at Notre Dame de Lorette, at the Trocadero, at Versailles, and at the Cathedrals of Nancy, Nimes, Saint-Omer, Porpignan, and Ghent. He also built organs at Sheffield (the Albert Hall organ), and other English towns, including the fine instrument which a year or two ago was destroyed by fire at the Colston Hall, Bristol.

The N. A. P. Window Company (Limited).—Under the compulsory winding up of this company the adjourned meetings of creditors and shareholders were held last Friday at the Carey-street offices of the Board of Trade, Mr. H. Brougham, Official Receiver, presiding. The statement of affairs showed liabilities £13,986, of which £8,957 were expected to rank for dividend, and assets £3,992, after deducting £4,931 for claims of debenture-holders. The chairman reported that the meeting stood adjourned on two previous occasions to enable an offer to be submitted. Since the last meeting, Mr. Tilley, the receiver for debenture-holders, had received from the Express Contract Company an offer for the assets. It was proposed to allot to the creditors of the old company fully-paid shares in the new N. A. P. Window Company of the face value of their proved claims. As regarded the debenture-holders, the Express Contract Company were prepared to pay in respect of each £5 debenture £2 in cash and £3 by the allotment of fully paid "B" cumulative preference shares of £1 each in the Express Contract Company. The debenture-holders had already assented to the arrangement, subject to the approval of the Court. Resolutions were passed accepting the offer and appointing Mr. A. A. Yeatman, chartered accountant, as liquidator to carry out the sale.

Norwich Grand Theatre and Opera House.—The contract for this building, which is to be erected on the old Norfolk Hotel site, has been let to Messrs. J. Youngs and Sons, of Norwich. It is estimated that the total cost will amount to about £40,000.

The Technical High School of Berlin celebrated its hundredth anniversary on October 19th, when the Emperor, in the course of his speech, laid stress on the equality of rank in which technical high schools stood towards the universities.

The Sinking Town of Northwich.—In the course of a Local Government Board inquiry on October 19th into the application to borrow £30,000 for sewerage purposes, it was stated that during the past twenty-two years the town of Northwich proper had sunk 7ft. 2in. on account of the brine pumping.

More Modern Church Building.—St. Andrew's Church, Chew Stoke, Somerset, is badly in need of repair, and the diocesan architect, Mr. Buckle, reports that the foundations were insufficient, causing a settlement of the building. The church is only about fifty years old.

The West Ham Technical Institute, which was opened about a year ago, and cost £70,000, was burned out last Monday morning. Messrs. Gibson and Russell were the architects, having won the first premium in the well-known competition. The damage is fully covered by insurance.

A Big Error.—The original estimate for the new lunatic asylum now being built at Warlingham was £140,482. The amended estimate now presented amounts to £199,125—a difference of £58,643! Application will have to be made to the Local Government Board for sanction to borrow this amount.

The Edinburgh Architectural Society opened the session on Wednesday, the 11th inst., with the annual business meeting. The following officials were elected: President, Mr. Alfred Sveig; vice-president, Mr. Percy E. Nobbs, M.A.; librarian, Mr. John F. Matthews; treasurer, Mr. A. Hay Lamont; joint hon. secretaries, Mr. Andrew Muir and Mr. Colin Cownie.

The Annual Conversazione of the Architectural Association was held at the Holborn Restaurant, on Friday evening, when the guests were received by the president, Mr. G. H. Fellowes Prynne, and Mrs. Prynne. The exhibitions of the students' prize drawings in the water-colour and colour decoration classes, and of some remarkable photographs and designs, were a source of much interest. The Association was founded in 1847, and now numbers over 1,300 members, the architectural instruction that it provides being the most complete that is to be obtained in the United Kingdom.

Ceramic Panels for Exterior Decoration.—At St. Margaret's Mission Church, South Coburg Street, Glasgow, Messrs. Doulton and Co. have sought to carry out on a stoneware basis the method of decoration known as majolica painting. The hard stoneware body is covered with an enamel that can be fired at the same heat as the body and in the same kiln. It is anticipated that paintings fused at such an intense heat will be able to permanently withstand the deleterious acids found in city atmospheres. Ordinary tile paintings have been found to be not always satisfactory as regards permanence.

Faringdon House, Faringdon, Berkshire, a house much associated with Oliver Cromwell, is now being extensively altered, and will shortly be completed. The house is soon to be the residence of Mr. Thomas Kingscote and the Hon. Mrs. Kingscote, of St. James' Palace. A new system of water supply, together with a new scheme of sanitary arrangements, have been carried out, and considerable structural alterations have been made to the house itself. Messrs. Mark H. Judge and Sons, of 7, Pall Mall, are the architects and engineers, and Mr. Guy Wilfrid Hayler is the clerk of works. Messrs. Cadel Bros., of Faringdon, are the contractors.

New Companies.

Rennie's Lead Syndicate, Limited.

This company was registered in Scotland the week before last with a capital of £3,000 in £1 shares, to adopt an agreement with W. G. Rennie, engineer, 6, Gillespie Street, Edinburgh, and to carry on the manufacture of lead traps and piping.

Edgar Vaughan and Co., Limited.

This company was registered on October 11th by Waterlow Brothers and Layton, Limited, Birchin Lane, E.C., with a capital of £4,000 in £1 shares, to carry on business as manufacturers of and dealers in rust preventers, varnishes, lacquers, paints, colours, dyes, oils, cements, pigments, chemical compounds, brushes, tinware, &c. The directors are to be elected by the signatories. Qualification, £50. Remuneration to be fixed by the company.

House and Garden Estate Company, Limited.

This company was registered on October 13th by Messrs. Hudson and Kearns, 83, Southwark Street, E.C., with a capital of £15,000 in £10 shares, to acquire and turn to account any lands or estates by planting, farming, or building thereon; as market gardeners, miners and smelters, builders and contractors, dealers in stone, sand, slate, lime, bricks, timber, &c.; as coal and salt merchants, advertising agents, jobmasters, licensed victuallers, carriers by land and water, ironmongers, printers, &c.; to construct and maintain gas and electric works, shops, stores, &c.

Dove Holes Brick Company, Limited.

This company was registered on October 16th, by P. G. Robinson, Temple, with a capital of £8,000 in £10 shares, to adopt and carry into effect agreements made by this company with J. S. Marchington and J. Marchington; to acquire certain land at or near Dove Holes, in the county of Derby, and to carry on business as brick, tile, and terra-cotta manufacturers, artificial stone makers, miners and smelters, metallurgists, &c; as general carriers, builders, merchants, coal merchants, &c.; and to acquire and turn to account any patents, patent rights, &c.

W. H. C. Walker, Limited.

This company was registered on October 6th by G. N. T. Haslam, with a capital of £5,000 in £1 shares, to carry on the general business of a builder and contractor, brick, tile, and terra-cotta manufacturer, as now and hitherto carried on by W. H. C. Walker at Brickkiln Street, and Heath Town, Wolverhampton; to develop and extend the said business, and with a view to the above objects or any of them; to adopt and carry into effect an agreement expressed to be made by W. H. C. Walker of the one part, and this company of the other part; to lay out land for building purposes; to undertake and carry on all kinds of agency business; to acquire and turn to account any patents, patent rights and inventions, machinery, &c.

Suburban District Investments, Limited.

This company was registered on October 11th by W. H. M. Dyson, 19, Tubbs Road, Harlesden, N.W., with a capital of £10,000 in £1 shares, to acquire and turn to account, in such manner as the company shall see fit, any lands, buildings, flats, and hereditaments of any tenure or description in the counties of London or Middlesex; as builders and contractors, decorators, merchants, and dealers in building materials; as stock and share dealers, estate managers, &c.; and, with a view to the above objects, or any of them, to adopt an agreement made by this company with F. J Loveday and W. H. M. Dyson. The directors are E. Bishop, W. H. M. Dyson, and F. E. Fellows. Qualification, £100. Remuneration, a percentage of the profit.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 4 0
Sainfoin mixture	do.	3 15 0	4 7 6
Clover, best	do.	4 0 0	5 0 0
Beans	per qr.	1 8 6	1 8 9
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 3 4	1 8 0
Colza Oil, English ...	per cwt.	1 5 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 9 0	—
Linseed Oil	per cwt.	1 3 0	1 3 3
Petroleum, American ...	per gal.	0 0 7	—
Do., Russian ...	per gal.	0 0 5 3/8—5 5/8	
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 6	—
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 17	—
Glue	per cwt.	1 14 0	2 18 0
Lead, white, ground, carbonate	per cwt.	1 2 0	1 3 0
Do. red	per cwt.	0 19 1½	—
Soda crystals	per ton	3 0 0	—
Shellac, orange	per cwt.	3 0 0	—

METALS.

Copper, sheet, strong ...	per ton	86 10 0	—
Iron, bar, Staffs. in London	do.	9 0 0	10 0 0
Do. Galvanised Corrugated sheet ...	do.	13 10 0	14 0 0
Lead, pig, Spanish ...	do.	16 10 0	—
Do. do. English common brands	do.	16 17	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	18 0 0	19 0 0
Do. pipe	do.	19 0 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	do.	9 15 0	10 15 0
Tin, Foreign	do.	144 12 6	145 2 6
Do. English ingots ...	do.	149 0 0	149 10 0
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	29 10 0	—
Do. Spelter	do.	21 17	22 5 0

TIMBER.

Soft Woods.

Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Do. Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	do.	4 0 0	6 10 0
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd.	do.	12 10 0	12 15 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	12 15 0	16 15 0
Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	10 0 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	9 0 0	16 15 0
Do. White Sea	do.	12 15 0	13 0 0
Do. Quebec Pine, 1st...	do.	20 0 0	23 15 0
Do. do. 2nd	do.	13 15 0	15 15 0
Do. do. 3rd &c.	do.	7 10 0	10 5 0
Do. Canadian Spruce, 1st	per P. Std.	8 15 0	12 10 0
Do. do. 3rd & 2nd	do.	8 5 0	8 10 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	7 0 0	9 5 0
Flooring Boards, 1 in. prepared, 1st	per square	0 11 0	—
Do. 2nd...	do.	0 9 0	0 11 0
Do 3rd &c.	do.	0 7 9	0 9 0

Hard Woods.

		£ s. d.	£ s. d.
Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4	—
Do. Honduras	do.	0 0 5 7/32	—
Do. Tobasco	do.	0 0 4 23/32	—
Elm, Quebec	per load	4 12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 13/16	—
Do. African ...	do.	0 0 4 7/16	0 0 7¼
Do. St. Domingo ...	do.	0 0 6 25/32	—
Do. Tobasco ...	do.	0 0 5 7/32—6 19/32	
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	7 10 0	17 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 2 1	0 3 6

COMING EVENTS.

Wednesday, October 25.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and demonstration at East London Soap Works, Bow, E. 3 p.m. H. D. Searles Wood, F.R.I.B.A., on "Building Materials." 8 p.m.

Thursday, October 26.

Worshipful Company of Carpenters.—(Lectures on Sanitary Building Construction).—Mr. Thomas Blashill on "Sanitary Construction." 7.30 p.m.

Friday, October 27.

Architectural Association.—Mr. Lawrence Harvey on "The Construction of Circular Stairs and Spiral Vaults." 7.30 p.m.

Sanitary Institute.—(Lectures for Sanitary Officers.)—Mr. Percival Gordon Smith, F.R.I.B.A., on "Sanitary Building Construction." 8 p.m.

Institution of Mechanical Engineers.—Ordinary general meeting. (1) Mr. William Ingham on "The Incrustation of Pipes at Torquay Water Works. (2, if time allows) Professor William Ripper on "A Continuous Mean-Pressure Indicator for Steam-Engines." 8 p.m.

Glasgow and West of Scotland Technical College Architectural Craftsman's Society.—Mr. Alex. Wagstaff on "My Impressions of Glasgow Cathedral." 8 p.m.

Saturday, October 28.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and Demonstration at the Richmond Main Drainage Works, Mortlake, at 3 p.m., conducted by Mr. William Fairley, A.M.I.C.E.

Monday, October 30.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers).—Mr. George Reid, M.D., D.P.H., on "Sanitary Appliances." 8 p.m.

Tuesday, October 31.

Royal Society of Antiquaries of Ireland.—Meeting at Dublin. 8.15 p.m. (1) Mr. Henry F. Berry, M.A., on "Ancient records of the Dublin Guild of Merchants, 1438-1671." (2) Mr. F. Elrington Ball, M.R.I.A., on "Monkstown Castle, near Dublin, and its History." (3) Mr. F. J. Bigger, M.R.I.A., on "The Antiquities of Inchcleraun in Lough Ree, co. Longford."

Wednesday, November 1.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and Demonstration in the parish of St. George, Hanover-square, at 2 p.m., conducted by Mr. Albert Taylor, chief sanitary inspector. J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of members. 8 p.m.

British Archæological Association. — Opening meeting of session at 8 p.m.

Thursday, November 2.

Worshipful Company of Carpenters.—(Lectures on Sanitary Building Construction.)—Mr. Keith D. Young, F.R.I.B.A., on "Principles of Ventilating and Warming Buildings." 7.30 p.m.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

BIRMINGHAM.—For the erection of new depôt, public offices, etc., Stratford-road, Sparkhill, for the Yardley Rural District Council. Mr. Arthur Harrison, architect, Queen Chambers, Colmore-row, Birmingham. Quantities by Mr. Anthony Rowse, 3, Newhall-street, Birmingham:

Harley and Son ...	£11,545	Whitehouse and Sons	£10,986
Moffat and Sons ...	11,380	Whittall and Son ..	10,860
R. Fenwick	11,095	F. Davis...	10,782
F. J. Briley	11,085	W. Bishop, King's Heath (accepted) ...	10,687
Bowen and Sons ..	11,065		
H. Gibbs	11,029		

BRIGHTON.—For the erection and completion of a pair of semi-detached villas in the Tivoli-crescent, Dyke-road, Brighton, for Mr. F. J. Foulger. Mr. H. M. Nye, architect, 47, Hova-villas, Hove:—

H. J. Penfold	£1,817	S. C. Smale	£1,384
W. Humphrey	1,600		

BURTON-ON-TRENT.—Accepted for the erection o No. 2 block of artisans' dwellings, for the Burton-on-Trent Artisans' Dwellings Company, Limited. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent. Quantities by the architect:—

Henry Edwards	£3,937 10

GREAT YARMOUTH.—For the erection of a mariners' chapel, institute, and house, for the British and Foreign Sailors' Society. Messrs. Bottle and Olley, architects, Great Yarmouth:—

For the Whole of the Works, Exclusive of Plumber, Painter, Gas, Heating, &c.

J. S. Cooper	£2,947 16	J. D. Harman	£2,468 0
Tice and Nicholls...	2,930 0	Carter and Wright	2,433 0
J. Moore	2,895 0	S. F. Smith	2,387 0
J. Ward	2,630 0	G. W. Beech	2,310 0
H. Wall	2,542 5	F. Grimble	2,299 0
J. S. Read...	2,490 0		

[All of Great Yarmouth.]

Plumber, Painter, and Glazier.

Lake and Burrell	£349 0 0	R. A. Eastoe ...	£297 7 6
R. H. Tooley... ...	307 18 0	J. E. Dyson	297 0 0
J. Atherton	300 0 0	J. W. Gooda* ...	287 18 0

* Accepted.

[All of Great Yarmouth.]

LONDON.—For rebuilding Nos. 416 418, and 420, Holloway-road, N., for Messrs. E. Hart and Co. Messrs. William Eve and Sons, architects:—

General Work (exclusive of Ironwork).

Harris and Wardrop ..	£4,18[illegible]	Patman and Fotheringham Ltd.	£3,821
Sheffield Bros.	4,097	Ward and Lamble ...	3,7 5
Holliday & Greenwood	3,897	W. Shurmur	3,728
McCornick and Sons ..	3,889	Chessum and Sons* ...	3,618
Johnson and Co., Ltd.	3,877		

Constructional Ironwork

Whitford and Co.	£1,798 0 0	Williams and Co.	£1,492 18 0
Moreland and Son, Ltd.... ...	1,700 0 0	Drew, Bear, Perks, and Co.*	1,429 7 1
Shaw and Co., Ltd.	1,659 0 0		

* Accepted.

LONDON.—For extension of laundry at Alric-avenue, Stonebridge Park, Willesden, N.W., for the White Heather Laundry. Messrs. William Eve and Sons, architects:—

Meach	£3,533 3 4	Hayworth & Son	£3,220 0 0
W. Shurmur ...	3,420 0 0	G. Wiggs ...	3, 34 0 0
Killby and Gayford	3,310 0 0	Patman and Fotheringham, Limited*	3,091 0 0
Sheffield Bros. ...	3,242 0 0		

* Accepted.

LONDON.—For the construction of new roads and sewers on the Dudding Hill Estate, Willesden, N.W. Mr. Richard Parry, engineer and surveyor, 27, Great George-street, Westminster, S.W.:—

Nowell and Robson	£20,955 16 3
Killingback and Co., Ltd.	18,142 2 4
Thos. Adams	17,487 5 3
James Pizzey	16,837 0 0
Neave and Son	16,812 0 0
Jackson and Son, Ltd.	16,568 14 6
R. Ballard, Ltd.	16,247 0 0
Wimpey and Co.	15,646 0 0

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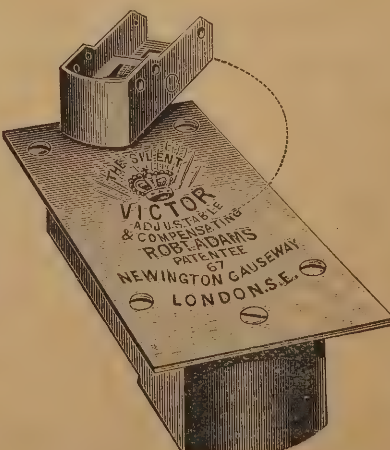

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LONDON.—For rebuilding the boys', girls', and infants' offices further away from the school building, in order to allow of the provision of halls should they be required; new closet on ground floor for female teachers, and providing new drainage scheme, with the exception of the school-keeper's house, at Shepperton-road School, for the London School Board. Mr. T. J. Bailey, architect:—

Monday and Sons ...	£2,470	Johnson and Co. ...	£2,395
L. H. and R. Roberts	2,465	Williams and Son ...	2,350
Falkner and Sons ...	2,453	Killingback and Co.	1,964
Lawrance and Sons ...	2,398	F. Bull*	1,911

*Accepted.

REIGATE.—For making roads, laying sewers, &c., Cronk's Hill Estate. Messrs. G. E. Pynn and Son, architects and surveyors, 97, Dood's-road, Reigate:—

Bentham and Co.	£2,574 0 0	M. S. Ketteringham	£1,800 0 0
Wm. Wadey ...	2,375 10 0	Streeter, Godalming*	1,749 15 0
S. Kavanagh ...	2,186 0 0	Pitt and Son ...	1,639 19 5
George Bell ...	1,963 0 0		
G. S. Faulker ..	1,955 0 0		

*Accepted.

SHADWELL.—For alterations and additions to The Mansion, Shadwell Court, near Thetford, Norfolk. Mr. H. J. Green, architect and surveyor, 31, Castle Meadow, Norwich:—

S. J. Waring and Sons	£13,743 18 5	Gillow and Co.*	£11,109 8 1
J. Youngs and Son	11,956 0 0	J. Shillitoe and Sons	10,891 18 9

* Conditionally accepted.

SURBITON.—For Ewell, Kingsdown, and Ditton roads Improvement, for the Urban District Council. Mr. S. Mather, C.E., Council Offices, Surbiton:—

S. Atkins	£2,550 0	S. Kavanagh	£2,030 0
J. Macklin	2,292 15	J. Nicholas, Tolworth, Surbiton*	1,887 12
Killingback and Co.	2,100 0		

Surface Water Drain, Ditton-road.

J. Macklin	£489 15 0	S. Kavanagh... ...	£283 19 8
Killingback & Son	370 0 0	J. Nicholas, Tolworth, Surbiton*	276 17 0
S. Atkins	350 0 0		
A. C. Soan	332 10 0		

*Accepted.

WATFORD.—For the erection and completion of a school in two departments (620 mixed, and 452 infants), at Judge-street, for the Watford School Board. Mr. W. H. Syme, architect, Watford:—

Mead and Burton ...	£16,739	Eames	£14,950
Wilson	15,923	Waterman	14,844
King	15,747	Wiggs	14,288
Brown	15,590	Brightman	13,860
Dupont	15,550	Jackson	13,828
Turner, Ltd.	15,387	Lewin	13,800
Tonge	15,040	Judge, Watford* ...	13,700

*Accepted.

WESTBURY-ON-TRYM.—For the execution of sewage-disposal works for the Barton Regis Rural District Council. Mr. A. P. I. Cotterell, C.E., Lonsdale Chambers, 7, Baldwin-street, Bristol:—

Geo. Bell	£9,052 1 0
H. W. Weldon, Birmingham	8,952 9 4

WOLVERHAMPTON.—For the erection of the new workhouse at New Cross, Wednesfield, for the Wolverhampton Board of Guardians. Mr. Arthur Marshall, architect, King-street, Nottingham:—

Lindsay Jones, Wolverhampton	£173,214
With extras	177,484
Williamson and Co., Nottingham	165,500
With extras	169,350
Robotham, Birmingham	164,500
With extras	168,250
Whitehouse and Son, Monument-lane, Birmingham	162,761
Or with glazed bricks	165,746
Merton Hughes, Birmingham	159,361
With extras	162,211
Willcock and Co., Wolverhampton	157,650
With extras	161,178
Moss and Co., Loughborough	154,350
With extras	157,100
Fish and Sons, Nottingham	154,156
With extras	156,879
T. Barlow, Nottingham (accepted)	145,800
With extras	148,656

[Architect's estimate, £123,000.]

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FIREPROOF CONSTRUCTION IN AMERICA.—II.

BY J. RAWSON GARDNER, of Montreal.

(*Concluded from p. lxvii., No. CCXLIII.*)

IN the first portion of this article several forms of fireproofing by means of concrete construction were illustrated and described. In this portion hollow tile construction will be dealt with. The use of hollow tiles for fireproofing purposes was coincident with the introduction of rolled I-beams—the first beams being rolled in America, at the Trenton works, in 1854, and the first patent for hollow tiles for fireproofing being issued in 1855 to F. A. Peterson, an American (see Fig. 1). Following this, in 1858, an Englishman, Joseph Bunnett, was granted a patent for both a side and an end construction arch. In this system, angle irons were set in the walls, tied at the upper end with tie rods, the arch springing segmentally from wall to wall. The form of voussoir used is shown at Fig. 2.

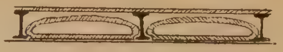


Fig 1

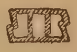


Fig 2

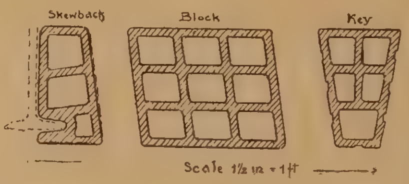


Fig 6

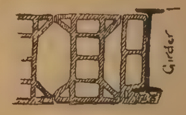


Fig. 11.

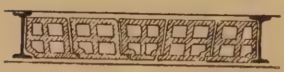


Fig. 3.

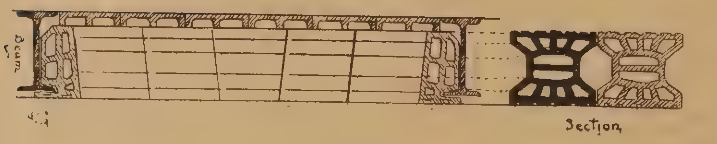
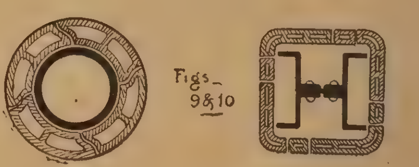


Fig 4


Figs 9&10

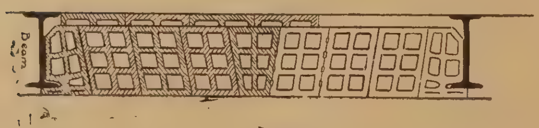
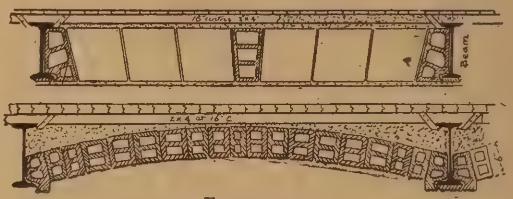


Fig 5



Figs. 7&8.

The next important change was made in 1867 by a Frenchman, Vincent Garcin, who took out a patent for what is considered the first flat hollow tile arch with voussoirs, similar in most respects to those in use at the present time. It should be noticed, however, that there is no covering to the lower flange of the beam, plastering being the only protection. This arch is illustrated at Fig. 3. Since then several systems have been placed on the market with more or less changes in minor details and with varying success, and some of these which are in use at the time of writing will be illustrated further on in this article. When studying the question of the most desirable form of hollow tile construction, one has to consider the question of "end pressure" *versus* "side pressure," besides the respective merits of hard, semi-porous, and porous material for the arch. In reference to cost, it would be well to bear in mind also that economy of floor construction is not merely in the material, but also in the disposition of the beams. As a general rule it may be taken that a close arrangement of columns is the most economical, but even with the same spacing of columns the possibility of variation in designing the framework of girders and beams is far greater than is commonly imagined.

It should be remembered that fireproofing a building is somewhat the same as building a fence—it is almost useless unless complete. One column left unprotected is like a fence with the gate left open. There are far too many buildings only partly fireproofed that are designated as fireproof buildings, which, when put to a severe test, collapse. These buildings have given the general public the impression that the extra cost of fireproofing may be doubtful gain, and it is hard, in the face of facts during the past, to blame them. Architects should be careful of their own reputation and not allow a building to be called a fireproof structure unless entirely so in every detail. The public, however, on their part should remember that the contents of a building are almost always inflammable, and when stored in a warehouse or departmental store where a large area of open floor space is exposed to the flames, the loss to the contents is sometimes larger in a fireproof building than in one that is not fireproof. In the latter case, the floors fall in and the contents are thrown into the cellar and covered over with bricks, mortar, and other *débris*, and in this manner are oftentimes protected. In the fireproof building the contents may burn out, as each floor, if not partitioned off in any way, acts as a large oven; the contents burn themselves out, but the building is not, or ought not to be, seriously damaged.

One weak point which seems to be so much neglected is that of the large plate glass windows almost universally used in large stores. These break when subjected to high temperatures from a conflagration in adjoining or opposite buildings, and the contents immediately ignite, starting what oftentimes becomes a large fire. If these windows were carefully protected by means of asbestic (or other fireproof material) curtains, many serious fires would be prevented.

In considering the different systems of fireproofing by means of hollow tile construction, let us take the forms of floor arches, &c., used by the following firms:—

1. Henry Maurer and Son, of New York.
2. The Central Fireproofing Co., of New York.
3. The Illinois Terra-Cotta Lumber Co.
4. The Pioneer Fireproofing Co., of Chicago.
5. The Fawcett Fireproof Co., of Philadelphia.

1. The form of "end pressure" arch as erected under the Maurer system is shown at Fig. 4, while the "side pressure" arch is shown at Fig. 5.

The following table gives the relative weights of the two different forms for floors of various spaces. By this table it will be seen that the end pressure construction is both lighter and stronger:—

"END PRESSURE."

Width between Beams.	Depth of Arch.	Weight pe square foot.
5ft. to 6ft.	8in.	27lbs.
6ft. to 7ft.	9in.	29lbs.
7ft. to 8ft.	10in.	33lbs.
8ft. to 9ft.	12in.	38lbs.

"SIDE PRESSURE."

4ft. 6in. to 5ft. 6in...	8in.	32lbs.
5ft. 6in. to 6ft. ...	9in.	36lbs.
6ft. to 6ft. 6in. ...	10in.	39lbs.
6ft. 6in. to 7ft. ...	12in.	44lbs.

An 8in. arch "end pressure" system of 8ft. span and 5ft. in length—that is 40 square feet of surface—carried, at a test made by the firm, 50,000lbs. equally distributed, and showed no deflection. This is equal to 1,250lbs. to the square foot. In reference to this subject of strength, Mr. Wight, an American fireproofing expert, in an article in the "Brickbuilder," of Boston, says:—"The actual tests of 'side pressure' arches of the best make have thus far shown that they break at from 500lbs. to 1,000lbs. per super foot, while those for 'end pressure' arches run up to about 1,700lbs.;" and again, "the end pressure system has not entirely supplanted the older side pressure system. It has its advantages when the ultimate weight to be carried on the floors is greater than 400lbs. per super. foot. As long as the rates of effective height to length of span is maintained within one to eight it is only a question of economy which to use." The advantages claimed for the older side pressure system is the greater ease of erecting and the courses break joint, which is not the case, so far, in the end pressure system.

2. The Central Fireproofing Company, of New York, use a side pressure system, illustrated at Fig. 6. This firm has recently issued a table of diagrams giving the allowable loads for semi-porous arches with $\frac{5}{8}$in. webs and shells (side pressure system), worked out on the formula—calculated by them—

$$\frac{280\,AD}{S^2} = W$$

Where A = least cross sectional area of arch 1ft. wide (in square inches).
D = total depth of terra-cotta arch (in feet).
S = span of arch (in feet).
W = safe load per square foot (in lbs.).

3. The Illinois Terra-Cotta Lumber Company make an end pressure arch with *both* skew-

backs and key set longitudinally with the beams, and in this detail it differs from the other forms illustrated. This system is shown at Fig. 7, and a segmental arch at Fig. 8. The tiles for encasing columns, used by this firm, are shown at Fig. 9 and 10, cast-iron and built steel columns respectively. It should be borne in mind that these blocks should be tied to the iron columns by iron ties, as this is a very important detail and one oftentimes omitted by the contractor.

4. The Pioneer Fireproofing Company, of Chicago, use an end construction arch similar to that shown at Fig. 4, but with voussoirs formed as shown at Fig. 11.

5. The Fawcett Fireproofing Company, of Philadelphia, system was illustrated and described fully in No. 226, dated June 7th, 1899, and as it is in use quite extensively in Great Britain, it will be unnecessary to make any further comments, except adding the following two tables, which will show some further details concerning this system. The construction of this floor with tile lintels and concrete filling, which forms a series of small concrete arches, is somewhat similar to the Homan's floor. Special note should, however, be taken of the method employed in this system to obtain an air passage:—

Table showing the Weight of Materials used in Constructing the Fawcett Ventilated Fireproofing System.

Materials used in Floor.	Wt. of floor material per sq. ft. of surface, for various size beams. Depth in Inches.								Materials used in Floor.
	4in.	5in.	6in.	7in.	8in.	9in.	10in.	12in.	
Steel Beams	3.7lb.	5.1lb.	6·9lb.	8.9lb.	10.5lb.	12.2lb.	15.5lb.	19.1lb.	Steel Beams
Lintels	15.0 „	15.0 „	15.0 „	15.0 „	15.0 „	15.0 „	15 0 „	15.0 „	Lintels
Concrete	26.0 „	32.5 „	39.0 „	45.5 „	52.0 „	58.5 „	65.0 „	78.0 „	Concrete
Wood Floor	3.5 „	3.5 „	3.5 „	3.5 „	3 5 „	3.5 „	3.5 „	3.5 „	Wood Floor
Plastering	7.0 „	7.0 „	7.0 „	7.0 „	7.0 „	7.0 „	7.0 „	7.0 „	Plastering
Total Dead Weight	52.2 „	63.1 „	71.4 „	79.9 „	88.0 „	96.7 „	106.0 „	122.6 „	Total Dead Weight

Note.—The dead weight per sq. ft. of surface is calculated for concrete 2in. above top of beams.

Table showing Size of Steel Beams used in the Construction of the Fawcett Ventilated Fireproofiing System.

Live Load per Sq. Ft.	SPANS IN FEET. 10 Feet.		12 Feet.		14 Feet.		16 Feet.		18 Feet.		20 Feet.		22 Feet.		24 Feet.		26 Feet.		Live Load per Sq. Ft.
	Depth.	Weight per ft.	Depth.	Weight per ft.	Depth.	Weight per ft.	Depth.	Weight per ft.	Depth.	Weight per ft	Depth.	Weight per ft.	Depth.	Weight per ft.	Depth.	Weight per ft.	Depth.	Weight per ft.	
lb.																			lb.
100	4 I	6.2	4 I	7.5	5 I	9.2	5 I	10.3	6 I	11 9	6 I	13.9	7 I	15.5	8 I	17.2	9 I	20.3	100
150	4 I	7.5	5 I	9.2	6 I	11.9	6 I	13.9	7 I	14.4	7 I	17.8	8 I	18.0	9 I	20 3	9 I	24.4	150
200	5 I	9.2	5 I	10.3	6 I	13.0	7 I	14.4	7 I	17.8	8 I	18.0	9 I	20.3	10 I	25.5	10 I	30.0	200
250	5 I	10.3	6 I	11.9	7 I	14.4	7 I	15.5	8 I	17.2	9 I	20.3	9 I	24.4	10 I	30.0	10 I	33.1	250
300	5 I	11.9	6 I	13.0	7 I	15.5	9 I	17.2	9 I	20.3	9 I	25.1	10 I	30.0	12 I	30.6	12 I	32.0	300

Note.—The above sizes of beams are for the finishing floor, including concrete 2 inches above top of beams, yellow pine flooring, and plastered ceiling.

Although the foregoing remarks do not by any means cover the field of fireproof construction in America, it is hoped that by them the reader will gain some idea of the methods usually employed in constructing a fireproof building—one that can withstand a severe fire and water test.

Improving the London Drainage.—A conference of representatives of London local authorities north of the Thames will be held at Paddington Vestry Hall next Friday, at 3 p.m., to urge upon the London County Council the necessity of immediately improving the main drainage system so as to prevent the flooding, during storms, of the low lying districts north of the river.

Masters and Men.

Carpenters' Wages. — The trade-union joiners and carpenters of Chester-le-Street, Northampton, and Dunfermline have just secured an advance of ½d. per hour in their wages; while at Hexham an increase of 1d. has been granted. These advances affect nearly 300 men.

Danish Lock-out Fund.—In answer to the appeal of the London Trades' Council for funds for the unemployed in Denmark during the recent lock-out, the Amalgamated Society of Carpenters and Joiners have made a levy on its members, which has realised £1,200. A cheque for the amount has been forwarded.

Bristol Plasterers' Strike Ended.—With reference to the strike of plasterers, the Bristol Master Builders' Association addressed a letter to the National Association of Operative Plasterers, and were informed by Mr. Dellar, the secretary, that all communications with reference to the strike would have to be made through the medium of the National Association of Master Builders. Accordingly, a representation was made to that body, and a meeting of representatives from Bristol, Liverpool, and London met at Birmingham. The position of matters was fully considered, and six representatives of the plasterers' society met six members of the Master Builders' Association. After the conference a settlement of the strike was signed on Saturday. The masters have practically conceded what the men required, and work is to be resumed to-day.

A Strange Proposal.—The strike of miners in the Spring Valley, Illinois, is naturally attracting considerable attention in the United States. Trans-Atlantic employers are tolerably familiar with the pretensions of the modern trades unionist, but they are staggered by the latest demand put forward on behalf of the Illinois pitmen. That demand, to enforce which some thousands of coal miners have struck, is that the employers should deduct the men's contributions to the labour organisations from their wages, and hand the cash over to the officials of such bodies. This the employers decline to do. It is not surprising that they should refuse to play the part of collectors for the funds of societies which are avowedly hostile to their interests.

A Coke Famine in Western Pennsylvania, U.S.A., is now prevailing, and unless relief is soon found the iron furnaces will have to bank their fires. The available supply of pig-iron, which has been continually diminishing lately, has now almost reached the low-water mark, and this fact is adding to the troubles of the furnacemen. The price of iron is now so high as to be in many cases almost prohibitive. The Carnegie-Rockfeller fight for the traffic of the Great Lakes has become a fight also to secure iron ore mines on the lake shores. This has caused the mine-owners to raise their prices, with the result of further increasing prices all along the line.

The Hull Building Trade Dispute.—The report that Mr. W. G. Bray, president of the Masters' Association, was amongst the members who had dissociated themselves from the policy of the majority of the members of the Association, and had called his men back, is untrue; in fact, the Association seems likely to win the fight. At a meeting last week a unanimous vote was passed condemning the action of the disloyal members, to the effect that they should each be fined the full penalty, viz., £10, and suspended from all office and voting at meetings until the termination of the strike. Over 100 voting papers were sent out to the masters employing non-unionist workmen; the returns showed that 951 men were now being employed by the sixty-seven masters who returned their papers. This shows a very satisfactory state of affairs for the masters, as only 1,500 men were employed at the beginning of the dispute.

British Workmen for the Paris Exhibition.—The Board of Trade has received through the Foreign Office copies of communications from the offices in London and Paris of the Royal Commission for the Paris Exhibition of 1900, respecting applications from British workmen for employment in connection with the Exhibition buildings. It appears that there has lately been some influx of British workmen into Paris with the object of obtaining work on the buildings, and, in view of the number of applications made at the Paris offices of the Royal Commission, it is thought desirable to point out that the French contractors are unlikely to employ foreign labour of any description, while foreign contractors charged with the erection of various foreign buildings import their workmen, as a rule, from their respective countries. Very few British contractors are connected with the construction of the exhibition buildings. British mechanics — carpenters, plasterers, painters, decorators, and others—would therefore be well advised before undertaking the risk and expense of a journey to Paris to make sure that suitable work will be obtained by them on their arrival.

Work and Wages in Germany.—Apropos of the Socialist Congress at Hanover, and by way of refuting the theory of the comrades that under the existing social system the poor are becoming poorer and the rich richer, the "Cologne Gazette" publishes an interesting column showing the improvement effected in the condition of the German workman during the past few years. Everywhere wages have risen, and the German workman's day's pay is now fairly respectable. More than two-thirds of the men employed by Krupp, who has an army of about 42,000 hands, earn on the average 4s. a day. Miners' wages have also been advanced considerably—by about 20 per cent. as compared with 1894. At the same time, the workman is insured against accident, ill-health, and old age. He is consuming 123.1 litres of beer as against 87.4 in 1878; 1.8 kilogrammes of tobacco, against 1.3; 11.8 kilogrammes of sugar, against 7.4; 6.30 kilogrammes of cotton goods, against 4.19; and 2.8 kilogrammes of coffee, against 2.3. These figures do not appear to indicate a declining prosperity. They have not, however, checked the growth of the Social Democratic party.

The Midland Counties Trades Federation held a meeting last week at Dudley, Mr. W. Millerchip presiding.—Mr. Webb referred to the dispute in the Birmingham iron-plate trade. Through the unwise action of one of the society's officials, he said, they were forced into a strike; but he was glad that the dispute was practically settled. With the exception of one they had all found employment in other factories. The strike, however, would no doubt be the means of teaching employers that they could not treat the workers as they thought fit.—Mr. J. Smith reported a dispute in the anchor trade, the men complaining that they were not receiving the proper price for a particular kind of work. He, however, wished the matter to be left in the hands of the officials of the Federation.—This was agreed to.—The chairman said the Walsall chainmakers had asked for an advance equal to 15 per cent., and a list was being discussed which would give a substantial increase.—The female chainmakers contended they were entitled to an advance. At present they were working 20 per cent. below the men, and about 400 were affected.—It was decided that the officials shall meet the workers.

Threatened Strike of Carters in Scotland.—Mr. Sampson, general secretary of the Scottish Carters' Association, has sent out a circular to all carting employers in the east and west of Scotland, calling attention to the fact that they had not yet complied with the request contained in the circulars issued on August 11th and September 27th, in which he, on behalf of the members of the association, demanded payment for stable duty at the rate of 6d. for each horse attended on Sundays, and 2s. extra on the existing rates of wages. As the patience of the members is now exhausted, it has been determined to deal with the matter in another way. The demands now are: (1) Two shillings per week advance on rates existing on September 27th. (2) Fifty hours week, and all time occupied beyond that period to be paid at the rate of 6d. per hour. (3) Stable duty on Sundays to be paid at the rate of 6d. for each horse attended on Sunday. Carters to arrange with employers how many horses one man will attend on Sunday. If these demands are not conceded on the 28th inst., a stoppage of work will take place.

A Strike in France of some magnitude has begun at the works of the Alsatian Company of Mechanical Constructions, one of the most important among the French metallurgical establishments. Nearly all of the 3,000 men employed have quitted the workshops because a workman named Linder, president of the labour union, had been discharged for threatening a comrade. Having ceased work the men, through the committee of their union, intimated that their resumption of work was conditional on the granting of the following demands: The re-engagement of Linder, the reduction of the hours of from ten and a half to ten, an increase of 25 per cent. in wages in lieu of bonuses, an increase of the wages of apprentices, the management by the workmen of the relief fund, the presentation by the company of the accounts for the past six years, the recognition of the labour union, the suppression of fines and piece-work, and a formal stipulation that no dismissal should be made for acts in connection with the strike. These demands were submitted to the company by a committee of the labour union, but thus far the only concessions admitted by the company are the return to work of Linder, and the management of the relief fund by the workmen. The men have resolved to continue the strike.

The National Association of Master Plasterers held their half-yearly conference at Birmingham last week, when an important proposal to affiliate the Scottish Association was considered. Upwards of eighty delegates attended from all parts of England, and a delegation attended from the Scottish Association, consisting of Messrs. M'Gilvray (president), Cook (secretary), Baird (Edinburgh), Stephen (Aberdeen), and Laburn (Dundee). The chair was taken by Mr. Sugden (Bradford), president of the English Association. The proposal, as sketched, was to arrive at an understanding that no member of the federated bodies would employ men engaged in a dispute with the associated masters of either country. The chairman spoke of the advantages of such a combination in dealing with disputes in any part of Great Britain. United action was more than ever necessary in the interests of the trade.—Mr. M'Gilvray expressed thorough agreement with the broad principles of the federation scheme, and promised to report favourably to the Scottish Association. Although the deputation were not in a position to pledge the associations they represented, he had no doubt of its acceptance, and he trusted a closer union would result between the associations.—Mr. Baird (Edinburgh) and the other Scotch delegates expressed concurrence. It was understood that details of the scheme would be formulated by the various secretaries and committees appointed for the purpose. It was resolved to double the membership subscription. The following resolution was adopted, and the secretary was instructed to forward a copy to the Master Builders' Association: "That this association is desirous of affiliating itself with the National Association of Master Builders, and would be glad to hear if that association would be willing to agree to such affiliation, and on what terms."

Demarcation of Joiners' Work.—A conference was recently arranged between representatives of the six principal trade unions in the joinery and cabinet making branches of the building trade to devise, if possible, means for the prevention of the constant disputes in regard to the apportionment of the details of employment between these branches.—The Conference, after discussion, adopted the two following resolutions: (1) "That this joint Conference of the representatives of the Cabinet Makers' and Carpenters' and Joiners' Trade Societies, after a prolonged discussion on the question of the constantly recurring friction between the members of the respective societies on the various classes of work upon which they may be engaged, consider that the attempt to define what work should be done by the members of the respective societies is impossible. But, in order to put an end to these deplorable disputes, the only solution of the difficulty, in our opinion, is that in all cases where joinery or cabinet and house furnishing firms tender for and obtain such work as ship, bar, bank, office, hotel, and the interior fittings of houses, that the members of the respective societies working for such firms should on no account accept other than the highest rate of wages, and conform to the conditions and privileges that may be established by the unions engaged in the wood-working trades in that particular district." (2) "In the event of any dispute arising between the members of the Carpenters' and Joiners' and Cabinet Makers' Trade Societies who may be working together, if not settled locally, the matter in dispute shall be laid before the respective Executive Committees, the men to remain at work until investigation is made into the cause of the dispute. Further, the Executive Committees of the above societies pledge themselves to deal with such cases within seven days from the time notice of such has been brought to their attention. Investigations into the causes of complaint to be made on the spot if necessary." It was decided by the Conference that a vote should be taken of the members of the six trade unions represented in the Conference on the question whether the two resolutions, as drawn, should be finally accepted. The votes were as follow: Amalgamated Society of Carpenters and Joiners, for the first resolution, 5,352, against 7,648; for the second resolution, 6,103, against 6,471. General Union of Carpenters and Joiners, for the first resolution, 1,319, against 706; for the second resolution, 1,377, against 605. Alliance Cabinet Makers' Association, for the first resolution, 1,566, against 77; for the second resolution, 1,605, against 39. Amalgamated Union of Cabinet Makers, for the first resolution, 691, against 106; for the second resolution, 743, against 61. Scottish Cabinet Makers' Union, for the first resolution, 446, against 1; for the second resolution, 434, against 11. The scheme cannot therefore be put into operation, but it is hoped that further discussion may lead to the adoption of some similar method by means of which disputes may in the future be avoided.

Builders' Notes.

Where the Jerry Builder is Unopposed.—At Hong Kong, says a writer in "Indian Engineering," houses are collapsing from sheer inability to stand up unpropped! It is said that houses are now being built of the worst possible refuse ever designated as bricks; the walls are constructed without mortar, merely dried blue bricks piled upon each other; and these walls are propped up with bamboo poles until the joists and roofs are put on to give them some semblance of "binding." This is a strong indictment and there is unfortunately much truth in it.

London County Council.—At the weekly meeting of the Council held on October 17th the recommendation of the Highways Committee was adopted that Mr. A. B. W. Kennedy should be appointed engineer-in-charge of the construction and re-construction works of the tramways and light railways for electric traction. Sanction was given to make application to construct four light railways in the suburbs:—(1) Holloway; (2) Clapham to Kingston; (3) Deptford to Shooters Hill and Woolwich; and (4) New Cross to Eltham. The total estimated cost of construction is £635,100, and that of the acquisition of property for the necessary street widenings, £130,900. It was decided to provide a home for inebriates at Charlwood at a cost of £14,250.

Public Works Without Contractors.—Major-General H. D. Crozier, R.E., recently held an inquiry at East Ham into an application for sanction to borrow £41,499 for electric lighting and for consent to the appropriation of certain land as a site for the works, and to borrow £3,600 for purposes of street improvement. The inspector, being informed that the Council had decided to do the work without contractors as far as possible, said that in that case they would have to employ separate workmen for it. They could not employ any man on their permanent staff under the Public Health Act to do this work on borrowed money. The surveyor said he had done it for years, and wanted to know whether the inspector considered it illegal. The Inspector: You are not to employ men in the permanent employ of the Council to do this extra work on borrowed money. That is the law.

Lead Poisoning Prosecutions.—A case of considerable importance to lead manufacturers was heard at Derby on October 18th.—Messrs. Cox Brothers, lead manufacturers, were summoned for not reporting two cases of lead poisoning, and also for storing red lead in a room where it was being manufactured.—Mr. C. H. Taylor, an appointed surgeon under the White Lead Rules, was summoned for failing to report a case of blood poisoning which took place. Though a number of cases of poisoning had taken place at the works, neither the employers nor the doctor, whose duty it was to make periodical visits, reported the occurrences to either the inspector or the Home Office. — The defendants admitted technical offences. Messrs. Cox Brothers were fined 10s. and costs in one case and 20s. and costs in the other.—The doctor was fined 1s. and costs.

A Dispute about a Patent for Preventing Slipping.—William Stevenson Dougall, an engineer of Radcliffe-on-Trent, recently sued Messrs. Watkin Bros., Limited, timber merchants, of Northampton and Leighton Buzzard, at the Bingham County Court for £10 in connection with a patent of his for covering pulleys. The case was heard on October 17th. The plaintiff said that he called on the defendants and they gave him an order to cover two pulleys at the agreed price of £10. He never guaranteed anything with regard to single "drivers," and said his patent would stop slipping if applied to all the pulleys about the machinery, but not otherwise.—The managing director of the defending firm stated that plaintiff had guaranteed to stop the slipping. This his patent did for two or three days, but ultimately proved useless. — His Honour, in causing judgment to be entered for the plaintiff, with costs, said the burden of proving that there was a guarantee was upon the defendants, and they had failed to satisfy him that there was one. He should have thought a limited company would have taken a guarantee in writing.

Surveying and Sanitary Notes.

The New Science and Art Schools at Newark, are being warmed and ventilated by means of Shorland's patent Manchester Grates, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Street Improvements at Derby. — A Local Government Board inquiry was recently held into the application of the Derby Town Council to borrow £9,598 chiefly for improvements in Larges Street, Pear Tree Road, and other thoroughfares.

Gnoll Road Congregational Church, Neath, has been warmed and ventilated by Messrs. John King, Ltd., engineers, Liverpool, who have installed their latest improved "Small Tube" hot-water heating apparatus, special economical coil-heater, and patent tubular exhaust ventilators.

Ventilation.—In Mr. G. S. Nicols' new workshop and show rooms, Bath Street, Glasgow (built from designs by Mr. L. B. Buick, Glasgow), Cousland's Improved Climax Patent "Natural Exhaust" Ventilators have been fitted by The Climax Ventilating and Heating Co., Ltd., of Glasgow.

At the New Sewage Works at Hampton, which was briefly referred to on page lxxxiii. of the supplement to last week's issue, the sewage is rendered innocuous by means of microbes. It is forced to the station by means of what are called Shone's injectors, and flows over beds formed of clinker and earth. Here it is left standing, so as to allow minute organisms, which cover every particle of the clinker, to attack the organic matter contained in the sewage, and after passing over two similiar beds (the clinker of which is of a finer character) the effluent flows out pure and sparkling. One of the most remarkable features of the system—which, by the way, owes its origin to Dr. Dibdin, formerly chemist to the London County Council—is that no chemicals whatever are employed in the process, and no sludge remains after the sewage is purified. The work of constructing the beds and laying the mrains was carried out by the Council by means of direct labour, and entailed an expenditure of £61,000. The system has been in operation now for ten months, and the chairman of the Thames Conservancy says it is a complete success.

For Street Improvements at Newcastle, estimated to cost £2,011, a Local Government Board inquiry was held on October 17th.

For Private Street Improvements at West Bridgford, estimated to cost £1,500, a Local Government Board inquiry was held on October 20th.

The Royal Commission on Sewege Disposal inspected the Birmingham Tame and Rea Drainage Board's farm on October 19th. Among those present were Sir R. Thorne, Sir Michael Foster, Professor Ramsay, Dr. J. B. Russell, Colonel Harding (Lord Mayor of Leeds), T. W. Killick, C. P. Cotton, F. J. Willis (secretary to the Commission), the Lord Mayor of Birmingham and several prominent local officials.

Improvements at Birmingham.—Colonel Marsh held a Local Government Board inquiry on October 17th at Birmingham into the application of the City Council for sanction to borrow £4,715 for works of sewage and surface-water drainage, £3,100 for the extension of the Corporation wharves at Harborne and Shadwell Street, £3,650 for improving the River Rea, and £3,000 for the improvement of the Hockley Brook. No opposition was made.

Laying out the Barry Parks.—The Barry District Council recently offered prizes of £100, £50, and £25 for plans for laying out the new Romilly Park and the Victoria Park. The competition was restricted to three landscapes gardeners, with the result that the first prize was awarded to Mr. Ralph Crossling, Penarth; the second prize to Mr. W. L. Skinner, Wakefield; and the third to Mr. A. Pettigrew, Cardiff. To the designs prepared by Mr. Crossling, the cost is £6,865 for Romilly Park and £3,590 for Victoria Park.

Engineering Notes.

Chester Tramways.—The Chester Town Council has decided to take over the undertaking of the Chester Tramways Company, Ltd.

Edinburgh and Leith New Gasworks.—The foundation stone of the new works at Granton of the Edinburgh and Leith Gas Commissioners was laid on October 16th.

The West of Scotland Iron and Steel Institute held the opening meeting of the present session on October 20th at Glasgow. Mr. James Riley, the chairman, introduced the newly-elected president, Mr. George Beard, of the Gartcosh Ironworks.

For Stealing Gas at Mansfield Matthias Baker was recently fined £2. It appears that he had made a connection with the gas pipe near the meter, and by means of an indiarubber tube took the gas to his rooms, without it passing through the meter.

An Electric Railway from London to Brighton is a scheme for which, it is stated, a Bill is to be deposited during the coming Parliamentary session. The railway will be an extension of the City and South London Railway, and it is reported that fares will be cheap and speeds high.

An Experiment in Lighting Country Railway Stations.—Up to the present the lighting of country stations by means of gas has been regarded as almost an impossibility, in consequence of the great expenditure and large plant required to work it successfully. The Great Central Railway Company are, however, making an experiment at Brocklesby Station, about ten miles from Grimsby. This company is the first railway company in Great Britain to adopt the system of lighting their country stations with Aerogene gas, although it has been in use for some time in Switzerland. If the experiment proves successful the gas will, no doubt, be introduced on all the company's country stations.

Glasgow Corporation Tramways.—The Glasgow Corporation Tramways Committee opened tenders on October 18th for the underground cables required for the extension of the trolley system, and resolved to recommend that the offer of the National Conduit and Cable Company, London, be accepted. The amount of the contract is £150,000.

An Electric Explosion took place at one of the most crowded points in Market Street, the principal thoroughfare of Manchester, on October 18th. The explosion occurred in a manhole under the pavement, and the force was sufficient to uplift three large flagstones, one of which, together with the covering of the manhole, was blown to pieces.

Hampshire Light Railways.—On October 19th the Light Railways Commissioners sitting at Whitchurch, Hampshire, sanctioned a scheme for the construction of a light railway in the Bourne Valley, connecting with the South-Western Railway system at Hurstbourne and with the Great Western by a junction with the Didcot, Newbury and Southampton line. The Earl of Portsmouth, who is the largest landowner in the district, opposed the scheme.

Sea Defence Work at Southwold.—The important sea defence work now being constructed in front of Southwold is proceeding very quickly. Rows of stout timbers are already in position, on top of which will be the Cliff Promenade, leading from Centre Cliff to Gun Hill, which path, since the memorable gale of 1897, has been destroyed. The tramway for taking material from the Salt Works' Creek is laid, and the work will shortly be ready for filling in.

The Institution of Civil Engineers.—The Council of the Institution of Civil Engineers have, in addition to the medals and prizes given for communications discussed at the meetings of the Institution during the last session, made the following awards in respect of other papers dealt with in 1898-99:—Telford medals and premium to L. Franzius (Bremen) and G. H. Thierry (Bremen) a George Stephenson medal and a Telford premium to G. Watson (Leeds); and Telford premiums to D. F. Vernon-Harcourt (London), F. Osmond (Paris), Max am Ende (London), T. E. Stanton (Liverpool), W. Hibbins (Bristol), James Strachan, C.I.E. (London), T. Donaldson (London), and T. W. Barber (London). For students' papers the awards were:—The James Forrest medal and a Miller prize to H. Lapworth (Birmingham); Miller prizes to F. C. Grimley (Colchester), W. Middleton (Chelmsford), F. T. Wolseley-Lewis (Manchester), A. H. Tyack (Manchester), R. A. E. Murray (Glasgow), C. R. Rutherglen (Glasgow), and W. D. S. Brown (Newcastle).

A New Method of Cooling Air.—According to the "Chicago Record" a machine has been built on novel principles for cooling the air of houses and apartments. It differs from the refrigerating machines now in use, which convert mechanical energy into heat, abstracted through the medium of liquefied gases, in that it depends on utilising the great latent heat of the evaporization of water. It is not intended for heavy refrigerative work, but for cooling at maximum efficiency over the range of 10deg. to 25deg. F., required to keep a room at comfortable temperature on a hot summer day. To furnish the forced blast which provides both the air circulation and the chilling effect, all that is required is a little electric blower. This evaporates the water, which is distributed in a capillary film so effectively that 10,000 cubic feet of air can be cooled to about 68deg. F. There is an automatic adjustment which keeps the temperature at any desired degree of humidity. The water can be taken from any local supply and current from the nearest available source. The apparatus requires no more attention than a common fan motor, and can be set up in sick rooms or hospitals, where such an appliance is often invaluable.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—		
Oct. 27	Alnmouth—Marine Residence		M. T. Wilson, Architect, Alnwick.
,, 27	Keith, Scotland—Addition to House	W. Gordon	F. D. Robertson, 92, Midd-street, Keith.
,, 27	Letterkenny—Alterations, &c., to Creeve House	D. Leitch	J. McIntyre, Architect, Letterkenny.
,, 27	Penygroes, Wales—Alterations, &c., to Chapel		Rev. W. E. Williams, Bryn Myfyr, Penrygroes, R.S.O.
,, 27	Weston-super-Mare—Photographic Studio		H. F. Price, Architect, Weston-super-Mare.
,, 27	London, S.W.—Retaining Walls and Foundations to New War Office	H.M. Commissioners of Works and Public Buildings	Sir J. Taylor, H.M. Office of Works, Storey's-gate, S.W.
,, 28	Warblington—Public Offices, &c.	Urban District Council	F. Swinburne, West-street, Emsworth.
,, 28	Kennethmont, Scotland—Workmens' Houses	Ardmore Distillery	C. C. Doig, Architect, Elgin.
,, 28	Canterbury—Six Cottages	Town Council	City Surveyor, Tudor-chambers, Canterbury.
,, 28	Harrow, near London—Manufacturing Premises		O. P. Parsons, 14, Temple-street, Birmingham.
,, 30	Halifax—Iron and Brass Foundries		Jackson and Fox, Architects, Rawson-street, Halifax.
,, 31	Barry, Glamorgan—Alterations, &c., to School	County Council	T. M. Franklen, County Offices, Westgate-street, Cardiff.
,, 31	Fletton—Schools	School Board	W. Boyer, 10A, Cowgate, Peterborough.
,, 31	Sandown, Isle of Wight—Higher Grade School	Brading School Board	J. Newman, Architect, Thornton, Sandown.
Nov. 1	Myton-on-Swale, Yorks.—School		W. Ward, Myton Hall, Helperby.
,, 1	Bargoed, Wales—Retaining Walls and Drainage		D. J. Longher, Architect, Bank-chambers, Pontypool.
,, 1	Gayton, Kings' Lynn—Alterations to Workhouse	Freebridge Lynn Union Guardians	H. T. Tilson, Architect, Railway-road, King's Lynn.
,, 1	Mallow—Repairs to Cottages, Sinking Wells, &c.	Rural District Council	M. Regan, Clerk, Mallow.
,, 2	Brecon—Intermediate Schools		J. H. Phillips, Architect, St. John's-chambers, Cardiff.
,, 2	London, N.—Chimney Shaft, &c.	St. Mary's Guardians, Islington	W. Smith, 65, Chancery-lane, W.C.
,, 2	Halifax—Chapel and Sunday School		M. Hall, 29, Northgate, Halifax.
,, 2	Alresford—Additions, &c., to Workhouse	Union Guardians	Board Room, Union Workhouse, Alresford.
,, 2	Deal—Underground Lavatory	Corporation	T. C. Golder, 23, Queen-street, Deal.
,, 3	Padstow, Cornwall—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.
,, 3	Banff, N.B.—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.
,, 4	Sheffield—Fireclay Goods (Retort Bricks, &c.)	United Gaslight Company	J. W. Morrison, Co.'s Engineer, Commercial-st., Sheffield.
,, 4	Rushall, near Walsall—Alterations, &c., to School	School Board	Hickton and Farmer, Architects, Bridge-street, Walsall.
,, 6	Bermondsey, S.E.—Painting and Decorating Town Hall	Vestry	Surveyor, Town Hall, Bermondsey, S.E.
,, 7	Douglas, Isle of Man—Enlarging Post Office	Commissioners of H.M. Works	J. Flew, 11, Popplewell-chambers, Market-street, Bradford.
,, 7	Walthamstow—School Buildings	School Board	W. A. Longmore, Bridge-chambers, Hoe-st., Walthamstow.
,, 7	Enfield—Girls' Department and Assembly Hall	School Board	G. E. T. Laurence, 181, Queen Victoria street, E.C.
,, 7	London, W.—Female Staff Home, &c., &c., at Infirmary	St. George's Union Guardians	E. T. Hall, 57, Moorgate-street, E.C.
,, 8	Victoria, Mon.—Forty Houses	J. Light	Shalwell and Creighton, Architects, Steam Packet-chmbrs., Dock-street, Newport, Mon.
,, 8	Hastings—Laying Fireproof Floor	Union Guardians	Jeffery and Hillier, 5, Havelock-road, Hastings.
,, 13	Leicester—Wholesale Market	Corporation	W. Brand, 16, Bishop-street, Leicester.
,, 13	Westbury-on-Severn—Tramp Wards, &c.	Union Guardians	W. F. Jones, 21, George-street, Gloucester.
,, 14	Woolwich—Public Library	Local Board of Health	Church, Quick & Whinsop, Architects, William st., Woolwich.
,, 15	Rhyl, Wales—School Buildings	Governors of Intermediate Schools	F. H. Shaylor, Architect, Belvoir House, Shrewsbury.
,, 20	Southampton—Workhouse Infirmary	Guardians	W. H. Mitchell, Son and Gutteridge, 9, Portland-street Southampton.
,, 22	Cricklade, Wilts.—Police Station	Standing Joint Committee	C. S. Adye, County Surveyor, County Offices, Trowbridge.
	ENGINEERING—		
Oct. 27	Cwm Brombil, Port Talbot, Wales—Laying Water Main		J. Taylor, Sons and S. Crimp, 27, Great George-st., S.W.
,, 27	Wivenhoe, Essex—Sinking Borehole	Urban District Council	Sands and Walker, Engineers, Angel-row, Nottingham.
,, 27	Darwen, Lancs.—Tramway	Corporation	Borough Engineer, Town Hall, Darwen.
,, 30	Birkenhead—Cooking Apparatus	Workhouse Guardians	E. Kirby, 5, Cook-street, Liverpool.
,, 30	Stonehaven—Harbour Extension	Harbour Trustees	J. Barron, 1, Bon Accord-street, Aberdeen.
,, 31	Chipping Campden—Waterworks	Rural District Council	N. Lailey, 16, Great George-street, Westminster.
,, 31	Aylesbury—Machinery at Sewage Disposal Works	Urban District Council	J. H. Bradford, 2, Rickford's-hill, Aylesbury.
Nov. 2	London, N.—Boiler and Building Flues, &c.	St. Mary's Guardians, Islington	W. Smith, 65, Chancery-lane, W.C.
,, 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
,, 4	Bahia, Brazil—Lighting Town		British Consulate, 6, Great Winchester-street, E.C.
,, 4	Faversham—Sinking Well	Water Company, Ltd.	B. Latham, 13, Victoria-street, Westminster.
,, 8	Wrexham—Electrical Plant	Town Council	W. H. Trentham, 39, Victoria-street, Westminster, S.W.
,, 11	Latheronwheel, Caithness—Breakwater	County Council	J. Brims, County Clerk, Thurso.
,, 11	Warrington—Covered Concrete Service Reservoir	Corporation	J. Deas, Engineer, Bank House, Warrington.
,, 14	Birkenhead—Electric Motor-cars for Tramways	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
,, 14	Glasgow—Engines	Corporation	J. Young, 88, Renfield-street, Glasgow.
,, 15	Blackburn—Destructor		W. Stubbs, Borough Engineer, Blackburn.
,, 15	Hoylake, Cheshire—Electric Lighting	Urban District Council	T. L. Miller, 7, Tower-buildings N., Water-st., Liverpool.
,, 30	Port Elizabeth—Railway		General Manager of Railways, Capetown.
Dec. 30	Panama—Aqueduct	Authorities	Commercial Department, Foreign Office, Whitehall, S.W.
,, 31	Porto Alegre—Electric	Municipality	Commercial Department, Foreign Office, Whitehall, S.W.
Jan. 3	Concepcion—Drainage and Waterworks	Chilian Government	Commercial Department, Foreign Office, Whitehall, S.W.
,, 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
	IRON AND STEEL—		
Oct. 31	London, E.C.—Railway Stores	Madras Railway Company	J. Byrne, 61, New Broad-street, London, E.C.
Nov. 1	Hoxton—Wrought-iron Fencing	London County Council	Parks' Department, County Hall, Spring-gardens, S.W.
,, 2	London, S.W.—Lamp columns, Gulley Gratings, &c.	St. Matthew's Vestry, Bethnal Green	F. W. Barrett, Vestry Hall, Church-row, Bethnal Green.
,, 29	Glasgow—Cast-iron Pipes	Corporation Electricity Department	Sir J. Marwick, Town Clerk, City-chambers, Glasgow.
	ROADS—		
Oct. 27	Glasgow—Street and Sewer	Corporation	A. B. McDonald, City Engineer, 64, Cochrane-st., Glasgow.
,, 27	Wareham, Dorset—Alterations, &c., to Footways	Town Council	G. C. Filliter, Town Clerk, North-street, Wareham.
,, 27	London, N.W.—Excavating and Carting	St. Pancras Vestry	T. W. Aldwinckle, 1, Victoria-street, S.W.
,, 28	Emsworth, Hants—Paving and Kerbing Footways, &c.	Warblington Urban District Council	F. Swinbourne, Council's Surveyor, West-st., Emsworth.
,, 28	Bath—Road and Sewers		Spackman and Son, 6, Terrace-walk, Bath.
,, 28	Witham, Essex—Broken Granite	Urban District Council	W. B. Blood, Clerk, Witham.
,, 28	Shoreham, Sussex—Flints	Urban District Council	Town Surveyor, Town Hall, Shoreham.
,, 30	York—Street Works	Corporation	A. Creer, City Engineer, Guildhall, York.
,, 30	East Grinstead—Making-up Roads	Urban District Council	R. Wilds, Surveyor, Council's Offices, East Grinstead.
,, 31	Altofts, Yorks.—Kerbing and Flagging	Urban District Council	W. Wilkinson, Surveyor, District Council's Office, Altofts.
,, 31	Deptford—Tar Paving, Wood Paving, Iron Fencing, &c.	London County Council	Parkes Department, County Hall, Spring Gardens, S.W.
,, 31	Silloth, Cumberland—Flagging, &c.	Holme Cultram Urban District Council	G. Armstrong, 24, Bank-street, Carlisle.
Nov. 2	New Barnet—Materials, &c.	Urban District Council	H. York, Surveyor to Council, Station-road, New Barnet.
,, 4	Eastbourne—Road Works	Highways and Drainage Committee	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
,, 6	Armagh—Materials	Urban District Council	J. C. Boyle, Town Surveyor, Charlemont-place, Armagh.
,, 6	Alvestoke—Cemetery Works	Burial Board	H. A. F. Smith, Surveyor, Star-chbrs., High-st., Gosport.
,, 6	London, W.—Crushed Thames Shingle	Paddington Vestry	Surveyor, Vestry Hall, Harrow-road, W.
,, 6	Bermondsey, S.E.—Vans and Carts	St. Mary Magdalen's Vestry	R. J. Angell, Bermondsey Town Hall, Spa-road, S.E.
	SANITARY—		
Oct. 27	London, N.—Slop Carts	Wood Green Rural District Council	Surveyor, Town Hall, Wood Green.
,, 30	Camberley, Surrey—Sewering	Urban District Council	W. J. Hodgson, Surveyor, High-street, Camberley.
Nov. 1	Alvaston, near Derby—Removal of Nightsoil	Urban District Council	E. Wildsmith, Clerk, Council Offices, Alvaston.
,, 3	Bulk, Lancaster—Scavanging	Rural District Council	J. Ennion, 5, Dalton-square, Lancaster.
,, 3	Thurnham, Lancaster—Scavenging	Rural District Council	J. Ennion, 5, Dalton-square, Lancaster.
,, 6	Hendon, N.W.—Sewerage, &c., Works	Urban District Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
,, 10	Darton, Yorks.—Sewerage Works	Urban District Council	W. H. Radford, Pelham-chambers, Angel-row, Nottingham.
,, 11	Kingsclere, Berks.—Drainage Works	Rural District Council	J. Barnes, Clerk, Kingsclere.
,, 15	Morecambe—Sewers, &c.	Urban District Council	Beesley, Son and Nichols, 11, Victoria-st., Westminster, S.W.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Oct. 28	Elland—Baths	2nd Premium £20, 3rd Premium £10	Clerk to Urban District Council, Offices, Elland.
Nov. 1	Horley, Surrey—Fire Engine Station	£10	R. L. Lowe, Clerk to Parish Council, Horley.
,, 30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *via* New York.
Dec. 1	Bury, Lancs.—Infectious Diseases Hospital	£100, £50, £25	Borough Engineer, Corporation Offices, Bury.

Property and Land Sales.

In the City of London.

Most important BUILDING SITE, situate on the east side of Finsbury-pavement, nearly opposite Moorgate-street Station and the Station now being erected on the City and South London Electric Railway. The site is covered with the houses numbered 42, 44, 46, 48, 50, and 52, Finsbury-pavement, and 1A and 2, South-place.

The site has a frontage of 166ft. to Finsbury-pavement, another frontage to South-place of 109ft., and it is bounded in the rear or east side by a paved yard, to which it has frontage and cart access. The superficial area is 16,750ft., and the entire site can be utilised, as it is exceptionally free from rights of light appertaining to adjacent properties, and it is admirably suited either for shops with offices over, or for banks, insurance offices, or public companies.

The above will be LET by AUCTION by

DANIEL WATNEY and SONS, by direction of the Fishmongers' Company, Governors of Holt School, and with the approval of the Charity Commissioners, at the Mart, Tokenhouse-yard, E.C., on THURSDAY, NOVEMBER 2nd, 1899, at TWO o'clock precisely.

Particulars, with plan and conditions of letting, may be had either of Mr. J. WRENCH TOWSE, Fishmongers' Hall, London Bridge; Mr. C. O. HUMPHREYS, Giltspur-chambers, Holborn-viaduct; Mr. HOWARD CHATFEILD CLARKE, the Company's Surveyor, 63, Bishopsgate-street-within; and of the Auctioneers, Messrs. DANIEL WATNEY and SONS, 33, Poultry, E.C. 1

SALE DAYS for the Year 1899.
Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, Oct. 26
Thursday, Nov. 16
Thursday, Nov. 23
Thursday, Dec. 7
Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

By EDWIN FOX and BOUSFIELD.

At the Auction Mart,

On WEDNESDAY, NOVEMBER 8th, at TWO o'clock, in Two Lots.

(By Order of the Trustee of the Rev. L. A. Sharpe, deceased.)

ST. GEORGE'S-IN-THE-EAST.—A Capital, Compact, FREEHOLD ESTATE, for investment or development, well situate just off the Commercial-road, and close to the London Docks, covering one acre, or thereabouts, with extensive frontages to James, Samuel, William, and Langdale streets, and is available for the erection of blocks of warehouses or dwellings. The site is at present occupied by sixty-four houses, workshops, and beerhouse, let on leases expiring Christmas, 1899, and Lady-day, 1901, at ground-rents amounting to £147 5s. per annum, with reversion at the expiration thereof, in less than two years, to the rack-rents estimated at about £1,600 per annum.

Particulars at the Mart; of Messrs. MORRELL and SON, Solicitors, Oxford; and Messrs. PAINES, BLYTH, and HUXTABLE, Solicitors, No. 14, St. Helen's-place, E.C.; and at Messrs. EDWIN FOX and BOUSFIELD'S Office, 99, Gresham-street, Bank, E.C.

Very Valuable Building Site, having the large area of 2,285ft. super, now occupied by No. 64, Leadenhall-street, in the CITY of LONDON, on the south side of the thoroughfare, and a few doors only from the important junction of Leadenhall with Fenchurch-street and Aldgate; highly suitable for the erection of block of offices, for which there is a demand in the locality, situate as the property is near to the shipping markets and the new centre now being formed by Lloyd's-avenue.

MESSRS. JONES, LANG, and CO. have been instructed to LET by AUCTION the above very valuable BUILDING SITE on FRIDAY, NOVEMBER 3rd, 1899, at TWO o'clock, at the AUCTION MART, Tokenhouse-yard, E.C.

Particulars, with condition of letting and plans, can be had of HENRY I. COBURN, Esq., Solicitor, 54, Leadenhall-street, E.C.; or of the AUCTIONEERS, 3, King-street, Cheapside, E.C., or at their Branch Office, 95, Leadenhall-street, E.C. Telegraphic Address, "Wonderment," London.

FREEHOLD CORNER BUILDING SITE, BERMONDSEY.

MESSRS. FIELD and SONS will SELL by AUCTION, at the MART, Tokenhouse-yard, E.C., on TUESDAY, OCTOBER 31st, 1899, at One for Two o'clock, a FREEHOLD BUILDING SITE, at the corner of Grange-walk and Fendall-street, together with the DWELLING-HOUSES thereon, now let to weekly tenants, and being Nos. 62, 63, 64, 65, and 66, Grange-walk, containing a superficial area of 7,350ft. with a frontage of 80ft. to Grange-walk, and of 108ft. 6in. to Fendall-street. The property offers a very fine site for warehouses or factories, as it is within a few minutes' walk of the Tower Bridge, the opening of which has caused an increased demand for such in this district, now brought within a very short distance of the centre of the City of London.

Particulars of Messrs. WYNNE-BAXTER and KEEBLE, Solicitors, 9, Laurence Pountney-hill, E.C.; at the Mart; and of the AUCTIONEERS, 54, Borough High-street, S.E., and 52, Chancery-lane, W.C.

R.I.B.A. EXAMS. PREPARATION, personally or by correspondence, in three, six, nine, or twelve months' courses. Architectural Lending Library. Special three months' finishing courses. — For full particulars apply to Messrs. HOWGATE and BOND, Associates R.I.B.A., Perchard House, 70, Gower-street, W.C. (close to the British Museum.

SANITARY INSPECTORS' EXAMINATIONS.—An Associate of the Sanitary Institute thoroughly PREPARES CANDIDATES for the above Exams. by correspondence; no books are required.—For particulars and testimonials apply, "Certified Coach," "Malabar," New Eltham, S.E. 6

TRACINGS and Photo Copies made; Photo Papers supplied; work called for on receipt of post card.—G. QUINLAN, 47, New-road, Wandsworth-road, S.W. 1

RECOVERY of TRADE DEBTS in the Metropolitan District for Builders' Material Merchants and Manufacturers is undertaken on special terms, and punctual attention given to all cases.—Address, in first instance, Box 1211, Office of "THE BUILDERS' JOURNAL." 5

ANSELL and MALLOWS, Architectural Draughtsmen and Quantity Surveyors, 21, Buckingham-street, Strand, W.C.

ARCHITECTURAL Institute, Society of Architects, and Civil Service Technical Examinations. Preparation by correspondence, personally, or in residence. Seventeen first places.—MIDDLETON and CARDEN, 19, Craven-st., W.C.

MODELS.
For Exhibitions or Law Cases.
Illustrations sent of Work Executed.
JOHN B. THORP, 98, Gray's Inn-road, W.C.

TO BUILDERS and CONTRACTORS.—On SALE Cheap, Slates and Slabs, Plain and Enamelled Chimney-pieces, and all other Slate Materials.—For Prices apply to J. H. JONES, Bryncrug Quarry, Towyn, Merionethshire. 1

APPOINTMENTS VACANT.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two.

IMPROVER.—WANTED for the Engineering Staff of the London Sanitary Protection Association, an IMPROVER, about 21 years of age. One who has been trained in a municipal engineer's office preferred.—Address, giving experience and terms to the "Secretary," 13, Charles-street, St. James's, S.W.

TO MARBLE MASONS.—WANTED several good FIXERS. Must be steady reliable men. Full wages. Constant job to first-class men. London job.—J. WHITEHEAD and SONS, Limited, Rochester-row, Westminster.

BUILDER'S CLERK WANTED. State age, qualifications, and salary required. Estimating indispensible.—"H.," 35, Charlton-lane, Charlton, S.E.

APPOINTMENTS WANTED.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two.

YOUNG ARCHITECT, A.R.I.B.A.,
ASSISTS in the
PREPARATION of DRAWINGS, TRACINGS, &c.,
at his own Office.
G. SCORER, 28, Newman-street, W.

ARCHITECT'S and Builder's ASSISTANT wants SITUATION for part of the day. In or outdoor work.—G. E., 1, Lithos-road, South Hampstead. 2

QUANTITIES PREPARED, SPECIFICATIONS WRITTEN, &c., by Experienced London Surveyor; full responsibility taken; terms by mutual arrangement.—Box 1,212, BUILDERS' JOURNAL Office. 24

ARCHITECT'S ASSISTANT requires EMPLOYMENT; seven years' experience, fifteen months with last employer; Good references; Knowledge of Civil Engineering, Land Surveying, &c.—Box 1205, BUILDERS' JOURNAL Office. 1

PAPERHANGER, GRAINER, General Decorator. Good colourman. Used to taking charge.—"W.," 18, Vale-road, Finsbury Park, N. 1

GRAINING, paperhanging, good painting, WANTED. Estimates for dilapidations to owners of Property and Estate Agents.—Box 1200, Office of the "BUILDERS' JOURNAL." 1

ABLE ASSISTANCE.
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DESIGNS, PERSPECTIVES, TRACINGS.
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DIFFICULTIES of PRACTICE advised upon.
F. BRENT, 34, Great James-street, W.C. 37

QUANTITIES prepared, specifications written, works measured, and variations adjusted by reliable London Surveyor. Over twenty years' experience. Special terms by arrangement.—"Surveyor," office of the BUILDERS' JOURNAL. 10

ASSISTANT, four and a half years' experience, seeks ENGAGEMENT; neat and accurate draughtsman, tracer, and colourist; accustomed to general office routine.—JAMES J. TWYCROSSE, Llanvair, The Avenue, Yeovil. 1

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DRAWING & TRACING OFFICE.

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Adjoining Holborn Town Hall.)

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For the PROMPT and EFFICIENT execution of all work usually required by the PROFESSION, such as

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MODELS, TYPEWRITING, &c.
TRACING and PRINTING Rooms, HATTON GARDEN, connected by Private Telephone.

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Head Office: 49, Queen Victoria Street, E.C.

Ten per cent. of the Premiums returned every six years in cases where no claim has arisen.

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Liberal Terms for Business Introduced.

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AND
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The Largest Circulation of any Architectural Building Journal in the Kingdom

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For Contract and Official Advertisements.

Competitions, Contracts, all Notices issued by Corporate Bodies, Local and other Boards, Prospectuses of Public Companies, and Trade Paragraph Advertisements:

	s.	d
Six Lines or under	6	0
Each Additional Line	1	0

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Six Lines or under	4	6
Each Additional Line...	0	9

(*The Average is Seven Words to a Line.*)

Situations Wanted or Vacant.

Four Lines or under (about 30 words)	1	6
Each Additional Line (about 10 words)	0	6

Three Insertions for the price of Two.

Advertisements of this class must reach the Offices not later than 6 p.m. on Monday.

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(Post Free.)

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TWYFORDS Ltd.,

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ADAMANT FIRE-CLAY URINAL RANGE.

Adamant Urinal Range

INSIDE SIZES.

	Height.	Width.	Depth.
Large	48in. ...	25in. ...	16in.
Medium ...	42in. ...	20in. ...	13in.

Non-absorbent, superior to Marble or Slate.

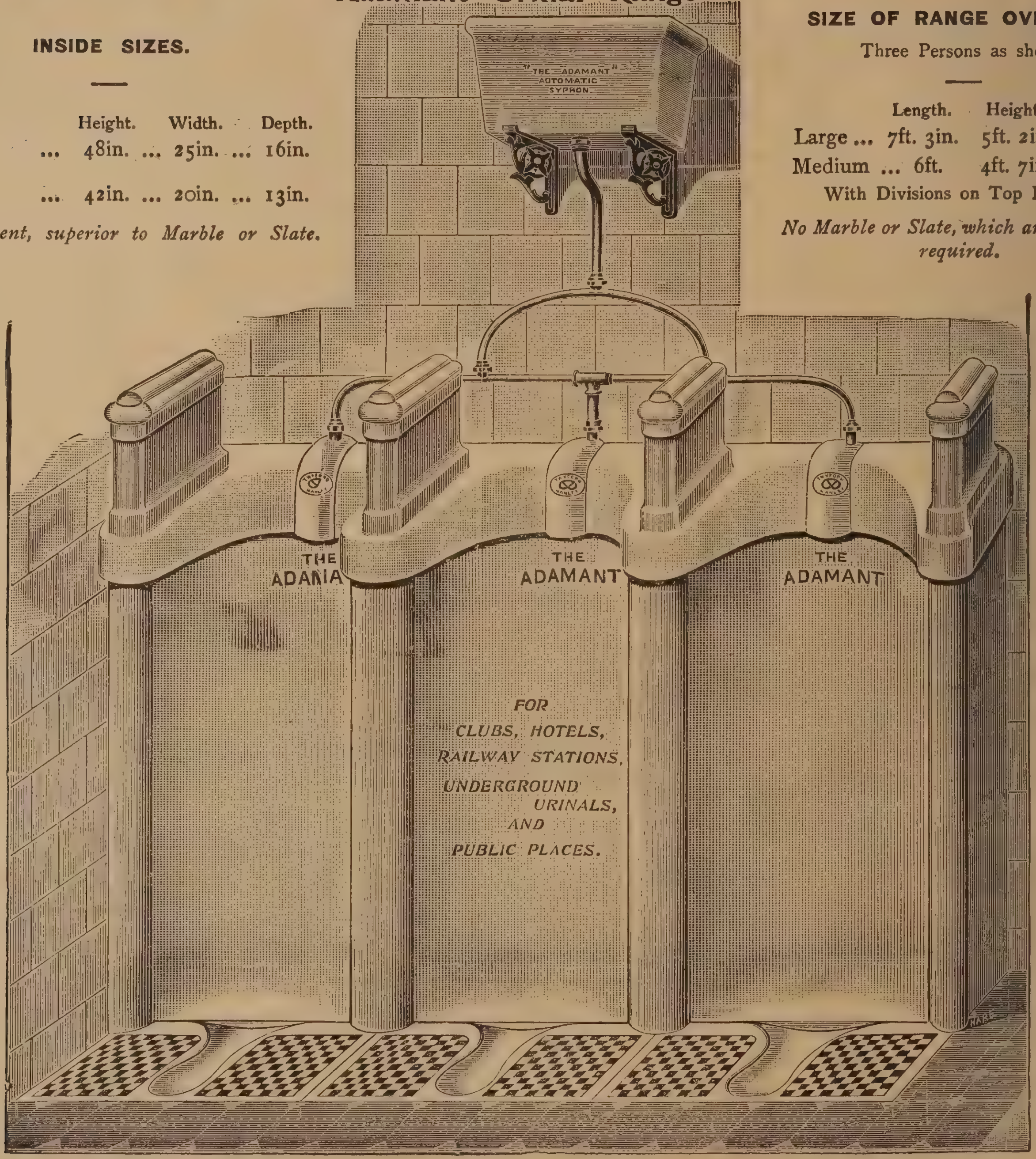
SIZE OF RANGE OVER ALL.

Three Persons as shown.

	Length.	Height.	Depth.
Large ...	7ft. 3in.	5ft. 2in.	1ft. 7in.
Medium ...	6ft.	4ft. 7in.	1ft. 4in.

With Divisions on Top Facings.

No Marble or Slate, which are absorbent, required.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PRICES.	Large.	Medium.
For Two Persons	£19 11 0 ...	£14 19 0
For Three Persons, as shown ...	29 5 6 ...	22 7 0
For Four Persons, " ...	38 0 6 ...	28 15 6
For Five Persons, " ...	46 7 6 ...	34 16 0
For Six Persons, " ...	56 4 0 ...	42 6 0

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Quotations given for Ranges for any number of persons.

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REDUCED *FAC-SIMILE* PAGE OF BUILDERS' PRICES.

Continuation of **Specification.** *Joiner.*

		s.	d.	£	s.	d.
Per foot super.	2in. framed, ledged, and braced door, covered one side with ¾in. ploughed and tongued and beaded or V-jointed match boarding	0	9	0	1	8
Per foot super.	2½in. framed, ledged, and braced door, covered with 1in. ploughed and tongued and V-jointed both sides match boarding	0	11	0	2	10
Each.	Cutting ends of ledges and letting into frame ...	0	3	0	0	3

DWARF DOORS AND FRAMES.

		s.	d.	£	s.	d.
Per foot super.	1in. square framed, one panel door	0	5½	0	0	11½
Per foot super.	1in. bead butt, or moulded and square, one panel door	0	5¾	0	1	1
Per foot super.	1in. bead flush and square, one panel door	0	6	0	1	1
Per foot super	1in. bead butt and moulded, one panel door	0	6	0	1	2
Per foot super.	1in. square framed, two panel door	0	6	0	1	1
Per foot super.	1in. bead butt, or moulded and square, two panel door	0	6½	0	1	1½
Per foot super.	1in. bead flush and square, two panel door	0	7	0	1	1½
Per foot super.	1in. bead, butt and moulded, two panel door	0	7	0	1	2½
Per foot super.	1¼in. square framed, one panel door	0	5	0	1	2
Per foot super.	1¼in. bead butt or moulded and square, one panel door	0	5½	0	1	3
Per foot super.	1¼in. bead flush and square, one panel door	0	6	0	1	3
Per foot super.	1¼in. bead butt and moulded, one panel door	0	6	0	1	4
Per foot super.	1¼in. stop chamfered and square, one panel door ...	0	5	0	1	3
Per foot super.	1¼in. square framed, two panel door	0	6	0	1	3
Per foot super.	1¼in. bead butt or moulded square, two panel door ...	0	6½	0	1	4
Per foot super	1¼in. bead flush or square, two panel door	0	7	0	1	4
Per foot super.	1¼in. bead butt and moulded, two panel door	0	7	0	1	5
Per foot super.	1¼in. stop chamfered and square	0	6	0	1	4
Per foot super.	Any of above, with bolection mouldings, extra ...	0	0	0	0	2

TWO PANEL DOORS.

		s.	d.	£	s.	d.
Per foot super	1in. deal, square framed ...	0	3	0	0	10
Per foot super.	1¼in. deal, square framed ...	0	3½	0	0	11
Per foot super.	1¼in. bead butt and square	0	4	0	1	0
Per foot super.	1¼in. bead flush and square	0	5	0	1	1
Per foot super.	1¼in. moulded and square	0	6	0	1	1
Per foot super	1¼in. bead butt both sides ...	0	6½	0	1	1½
Per foot super.	1¼in. bead butt and bead flush	0	7½	0	1	2
Per foot super.	1¼in. bead flush both sides	0	8	0	1	2½
Per foot super	1¼in. bead flush and moulded	0	8	0	1	3
Per foot super.	1¼in. stop chamfer and square	0	6	0	1	1
Per foot super.	1½in. deal, square framed ...	0	4	0	1	0
Per foot super.	1½in. bead butt and square	0	5	0	1	1
Per foot super.	1½in. bead flush and square	0	6	0	1	2½
Per foot super.	1½in. moulded and square ...	0	6	0	1	3
Per foot super.	1½in. bead butt both sides ...	0	6½	0	1	3
Per foot super.	1½in. bead butt and bead flush	0	6½	0	1	4
Per foot super.	1½in. bead flush both sides	0	7½	0	1	4
Per foot super.	1½in. bead flush and moulded	0	8	0	1	5
Per foot super.	1½in. moulded both sides ...	0	7	0	1	4
Per foot super.	1½in. moulded one side, bead butt other	0	7	0	1	4
Per foot super.	1½in. moulded one side, bead flush other	0	8	0	1	4½
Per foot super.	Any of above with raised panels, extra	0	1	0	0	1½
Per foot super.	Any of above with bolection mouldings, extra ...	0	1	0	0	2
Per foot super.	Doors of any of above descriptions, but with three panels instead of two, should be priced extra to the above prices ...	0	2	0	0	2

Two Panel Doors in Woods other than Deal

Prices per foot superficial including all materials.

		Pitch Pine		Sequoia		Honduras Mahogany		Walnut.		Teak		Spanish or Cuba Mahogany	
		s.	d	s	d.	s.	d.	s	d	s.	d.	s.	d
Per foot super.	1in. 2-panel square framed doors ...	1	2½	1	6	2	8	2	10	3	0	3	5
Per foot super	1in. 2-panel bead flush and square doors ...	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super	1in. 2-panel moulded and square doors ...	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super.	1in. 2-panel moulded and bead flush doors ...	1	5	1	8	3	1	3	3½	3	6	3	10
Per foot super.	1in. 2-panel bead flush both sides, doors ...	1	5½	1	8½	3	1½	3	5	3	7½	4	2
Per foot super.	1½in. 2-panel square framed doors ...	1	4½	1	7	2	10½	3	1	3	4	3	9½
Per foot super.	1½in. 2-panel bead flush and square doors ...	1	5	1	8	3	1½	3	5	3	7½	4	2
Per foot super.	1½in. 2-panel moulded and square doors ...	1	5½	1	8	3	1½	3	5	3	5½	4	2½
Per foot super.	1½in. 2-panel moulded and bead flush doors	1	6	1	8	3	2½	3	5½	3	10	4	2½
Per foot super.	1½in. 2-panel bead flush both sides doors ...	1	8	1	10½	3	4	3	7	3	11	4	5½

FOUR-PANEL DOORS.

		Labour only.		All materials and labour.		
		s.	d.	£	s.	d.
Per foot super.	1in. deal, square framed ...	0	3½	0	0	11
Per foot super.	1¼in. deal, square framed ...	0	4	0	1	0
Per foot super.	1¼in. bead butt and square	0	4½	0	1	1
Per foot super.	1¼in. bead flush and square	0	5½	0	1	2
Per foot super.	1¼in. moulded and square	0	6½	0	1	2
Per foot super.	1¼in. bead butt both sides ...	0	7	0	1	2½
Per foot super.	1¼in. bead butt and bead flush	0	8	0	1	3
Per foot super.	1¼in. bead flush both sides	0	8½	0	1	3½
Per foot super.	1¼in. bead flush and moulded	0	8½	0	1	4
Per foot super.	1¼in. stop chamfered and square	0	6½	0	1	2
Per foot super.	1½in. deal, square framed ...	0	4½	0	1	1
Per foot super.	1½in. bead butt and square	0	5½	0	1	2
Per foot super.	1½in. bead flush and square	0	6½	0	1	3½
Per foot super.	1½in. moulded and square ...	0	6½	0	1	4
Per foot super.	1½in. bead butt both sides	0	7	0	1	4
Per foot super.	1½in. bead butt and bead flush ...	0	7	0	1	5
Per foot super.	1½in. bead flush both sides	0	8	0	1	5
Per foot super.	1½in. bead flush and moulded	0	8½	0	1	6
Per foot super.	1½in. chamfered both sides	0	7	0	1	2
Per foot super.	1½in. stop chamfered and square	0	7	0	1	3
Per foot super.	1½in. stop chamfered both sides	0	7½	0	1	3½
Per foot super.	1½in. stop chamfered and moulded ...	0	7½	0	1	3½
Per foot super.	1½in. moulded both sides ...	0	8	0	1	5
Per foot super.	Any of above with raised panels, extra	0	1	0	0	2
Per foot super.	Any of above with bolection mouldings, extra	0	1½	0	0	2
Per foot super.	Any of above with upper panels quirk-moulded, extra	0	1½	0	0	2
Per foot super.	2in. square framed doors	0	5½	0	1	3
Per foot super.	2in bead butt and square	0	6	0	1	4
Per foot super.	2in. bead flush and square ..	0	7	0	1	5
Per foot super.	2in moulded and square	0	7	0	1	5½
Per foot super	2in bead butt both sides	0	7	0	1	5½
Per foot super	2in bead butt and bead flush	0	7½	0	1	5½
Per foot super.	2in bead flush both sides ...	0	8	0	1	7
Per foot super.	2in. bead flush and moulded	0	7½	0	1	8
Per foot super.	2in. chamfered both sides	0	7½	0	1	3
Per foot super.	2in. stop chamfered and square	0	6½	0	1	4

THE FINEST COMPILATION OF BUILDERS' PRICES.

REDUCED *FAC-SIMILE* PAGE OF SPECIFICATION CLAUSES.

Continuation of **Specification.** *Concretor.*

WORKMANSHIP.

GENERALLY.

24. **Proportions.** Proper boxes or measures must be provided for accurately measuring the proportions of the various materials for the concrete. Such proportions to be ascertained by actual measurement at each mixing.

25. **Mixing.** The materials for the concrete are to be mixed by first filling a cubic yard or other suitable measure with the aggregate, then adding the cement (which must be separately measured). The whole to be twice turned over dry, then shovelled into a third heap, at the same time adding from the rose of a watering-pot sufficient water only to make the ingredients cling together. The materials to be again turned over in a wet condition before being removed and deposited in position. All necessary precautions must be taken to prevent the cement being blown away during the mixing.

26. **Porous materials to be wetted.** The whole of the coke breeze, broken brick, stone, or other porous aggregate to be well wetted with water before mixing, turned over, and allowed to drain, so that the surfaces may be damp, but not wet, when required for use.

27. **Concrete to be freshly made.** The concrete is to be mixed in convenient quantities to suit the requirements of the work. The chopping up and use of concrete or cement which has begun to set will not be permitted.

28. **Levelling.** All concrete when deposited in position is to be carefully levelled or laid to falls as may be required, and brought to an even and finished state.

29. **Setting.** Every care must be taken not to disturb the concrete whilst setting. In all cases where it is found absolutely necessary to pass over newly formed concrete, planks are to be carefully laid down.

30. **Work prohibited during frosty weather.** No concrete work shall be executed during frosty weather, nor even if there shall be any probability of a frost occurring before the concrete has had sufficient time to set.

FOUNDATIONS.

31. **Concrete in Trenches.** The concrete to be lowered into the trenches and not thrown in. After the concrete has been deposited in position it is to be well worked against the sides of the trenches by means of a spade or trowel, lightly rammed with wooden beaters, properly levelled, and brought to an even surface.

32. **Building on Concrete.** An interval of seven days (or such other period as may be directed) is to elapse between the completion of the concrete foundations and the commencement of any building upon them.

UNDER BOARDED FLOORS.

33. **Laying.** The concrete to be 6in. in thickness, lightly rammed with wooden beaters until the moisture rises to the surface, floated to a smooth and even face and finished to proper falls or levels.

UNDER TILE OR OTHER PAVEMENTS.

See Clause 33.

PAVING.

34. **Laying.** The concrete paving to be 6in. in thickness, finished with a granite surface, and smoothly floated to proper falls or levels.

35. **Granite Surface.** The surface of the concrete paving to be formed with a layer of granite concrete 1in. in thickness, lightly rammed with wooden beaters and floated to a perfectly smooth and even face. The entire thickness of the paving to be laid and finished in one operation.

36. **Expansion Boards.** Provide and fix expansion boards or slips at intervals of every 12ft., including removing same at completion, filling up the cavity with concrete and making good the surface.

37. **Watering Surfaces.** The finished surface of the concrete to be kept damp for at least seven days (or fourteen days) after being laid, by covering with wet sand or sawdust. The sand or sawdust to be kept moist during the period named by frequently sprinkling it with water from the rose of a watering-pot.

38. **Protection.** The concrete surfaces to be properly protected from any injury that might be caused by passing traffic, falling materials, etc.

39. **Freedom from Discolouration.** The surface of the concrete paving to be of uniform colour throughout, and free from any stain, discolouration, or other defect.

40. **Surface Channels.** Surface channels, having a shallow curved section, to be formed in the concrete paving where shown on the drawings. To be laid to proper falls, and neatly dished round the top of each gully.

UPPER FLOORS.

41. **Laying.** The concrete to be hoisted to the required height, and carefully filled in between the rolled steel (or iron) joists to a depth of 9in. (or other specified thickness), lightly rammed with wooden beaters, and levelled and floated to an even surface. Each concrete floor is to be laid and completed at one operation, the necessary arrangements being previously made for carrying on the work without cessation.

42. **Watering Surfaces.** *See* Clause 37.

43. **Sheeting.** Provide and fix proper deal rough (or wrought) flat sheeting, with flush joints, including all necessary supports and strutting that may be required, and remove at completion.

43a. **Alternative Clause.** Provide and fix proper deal rough (or wrought) sheeting on proper centres or turning pieces, and of the curvature shown on the drawings. To include all necessary supports and strutting that may be required, and remove at completion.

44. **Removal of Sheeting.** The sheeting, &c., is not to be disturbed for a period of at least fourteen days after the concrete has been laid (or such other period as may be considered necessary), and it shall not be removed without first obtaining the sanction of the architect (or engineer) in writing.

45. **Sheeting to be Wetted.** The upper surface of the sheeting to be well wetted from the rose of a watering-pot before depositing the concrete upon it.

WALLS, PARTITIONS, STANCHIONS, Etc.

40. **Depositing.** The concrete to be carefully deposited in position, and lightly rammed between the casing and around the iron or other cores as shown on the detail drawings.

47. **Girders and Stanchions.** All projecting girders and stanchions to be similarly encased with concrete where required.

48. **Casings.** Provide and fix proper deal casings with flush points, including all necessary timbering and strutting, and remove at completion.

48a. **Moulds.** Provide and fix proper moulds to all bull-nosed angles, reveals for door frames, chases, and recesses where shown on detail drawings, and remove at completion.

49. **Removal of casings.** The casings and moulds shall not be removed until the concrete has thoroughly set.

LINTELS.

50. **Moulded Work.** The concrete for lintels to be filled into properly constructed moulds or boxes and well worked around the iron or other cores as shown on the detail drawings. The lintels to be made 18in. longer than the opening over which they are to be fixed, so that they may rest 9in. on the wall at each end. To be 9in. in depth for all spans not exceeding 4ft., and 12in. in depth for all spans exceeding 4ft. and not exceeding 6ft.

51. **Cores to be Embedded.** All lintels having a bed or width not exceeding 9in. to have a core consisting of a 3in. × 3in. rolled steel (or iron) joist weighing 10lb. per foot run properly embedded in the same. An additional joist to be added for every additional 9in. in width or bed of lintel.

52. **Seasoning.** The concrete lintels to be left in the moulds until properly set, and to be made at least six weeks before being required for building into position.

53. **Moulds.** Provide all necessary moulds, casings, and patterns that may be required for the proper construction of the concrete lintels as shown on the detail drawings.

BRICKS.

54. **Fixing Blocks.** Breeze bricks to be built into the walls where shown on drawings or otherwise directed for the proper fixing of joinery, etc. The concrete to be filled into suitable moulds and allowed sufficient time to set and harden before being used.

SEA AND RETAINING WALLS.

55. **Concrete to be carried up uniformly.** The concrete to be carried up uniformly over the whole area embraced in each section under construction, no part to be more than 3ft. higher than another. To be laid in horizontal courses not exceeding 18in. deep.

REASONS

Why you should purchase the 4th Number of Specification.

1.—It is the only book that covers the wide field of Modern Constructional Work.

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NOTHING BUT - - PRAISE -

Has been Received!

* * *

NOT A SINGLE NEGATIVE REMARK has been made by the thousands of Architects, Builders and Contractors who have purchased the early numbers of this Work. ❧ ❧ ❧ ❧ ❧ ❧

Published at Effingham House, Arundel Street, Strand, London, W.C.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS

November 1, 1899.
No. CCXLVII.

Effingham House,
Arundel Street,
Strand, W.C.

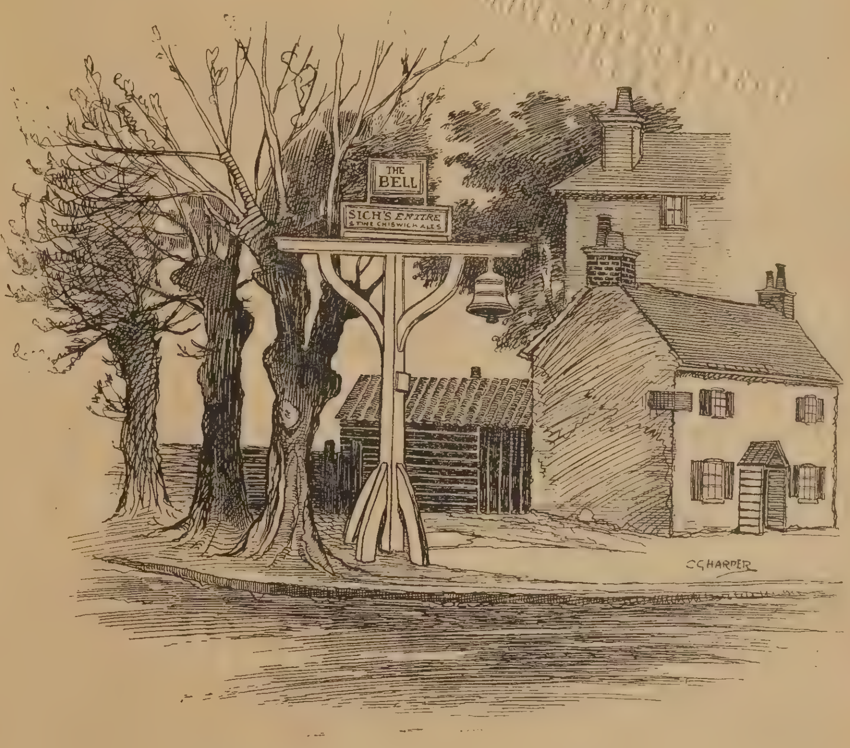
An Architectural Causerie.

The Passing of the Suburban Inn.

The builder is so active in the suburbs of London, and the brewers and licensed victuallers so greedy of huge profits, that the last days of the semi-rural picturesque roadside inn are come. There has always been such an outcry against the destruction of these old-world places for the sake of building towering modern gin-palaces that the ordinary man might well think the best business policy to be that which preserved the buildings that made such pictures, and were surrounded with so much affection and romance. But this is one of those things "which no fellow can understand," as Lord Dundreary remarks in the play. We all acknowledge that the picturesque inn is worth preserving and that it should be retained, yet we pull all the best examples down, and vulgarise the sites of them, painting the moral and picturing the shame of it by decorating the halls of the gin-palaces that take their place with painted tile-pictures of what has disappeared to make room for all this plate-glass and glitter. There would in many instances really seem to be no reason why this destruction should take place. When the old "Cock" at Sutton was pulled down a year ago, there disappeared as fine and substantial a house as one could wish to see, and one connected with the old coaching days and the Prince Regent, who halted here in his carriage on the way to and from "Brighthelmstone," as Brighton was then called. Was there any valid reason for demolishing the place? The answer must be in the negative, for in this instance the new building of the "Cock" occupies a somewhat different site, and the old site is still a desolate heap of bricks.

The latest suburban inn to disappear is the "Bell," at Hounslow. Just where the highway divides in two, at the west end of that town, the old "Bell" stood, quaintly edged in by polled elms, and with a gallows-like sign hanging over the footpath bearing a great blue and gilded bell. Local legends say that the Knights of the Road who haunted Hounslow Heath in the old coaching days were in league with local inn-keepers, and particularly with mine host of the "Bell," who had a kind of "information bureau" on their behalf of likely travellers passing the turnpike gate that formerly stood just here. Hounslow Heath disappeared many years ago, converted from a flat, dreary, and dangerous waste to a wide stretch of market gardens. When railways came in, and the great highway to the West of England that ran through Hounslow became deserted, that town, which had been one of the busiest coaching centres in the kingdom was utterly ruined, and the many old coaching inns were either pulled down or converted into shops or private houses. The "Bell" was practically the last relic of those old days, and now it has gone Hounslow is nothing but an ordinary, and a very unpleasing, London suburb. Many another old-fashioned inn demolished within the last two or three years might be named, the "Brockley Jack," and the "Red Cow," at Hammersmith, among them: but the task of enumerating what we have lost would be both painful and unprofitable. Only let us put them on record as they go, to show to future generations how superficial our sentiment and how ingrained our commercialism at the close of the nineteenth century.

C. G. H.


THE BELL
SICH'S ENTIRE & THE CHISWICK ALES
CGHARPER

THE BELL, HOUNSLOW. DRAWN BY C. G. HARPER.

The Cathedral of Pan.

Long, green, endless aisles, all moist and glistening with the dank air, running eastward and westward! The eastern end is so far that it is lost in a multitude of shadows, thrown by the innumerable columnal beeches and sturdy oaks on either side. There is no sound in all the woods around, scarcely a movement in the tracery of boughs overhead, while the shadows are hazy and diffused, very different to the clear-cut reliefs and sharp, crisp lines and masses of shade that belong to summer. This is the vast Cathedral of Nature; yonder at the end of the great natural nave is the altar, and from all around comes the breathless, silent worship of the drenched woods, hanging perfectly still in the quiet, evening air. Few lovers of forest scenery will find the mental transition hard, from the long, green aisles and avenues of trees to the arched nave of Gothic splendour. It is without doubt Gothic, this vast church of the woods. The severe beauty of its form, the almost awful purity of its conception! Endless rows of columns rising beyond each other, whence spring clustered lines of interwoven vaulting, where every line is a varied form of excellence, and every composite excellence is conducive toward a marvellous whole. Is there a cathedral built with men's hands that has such a west window as this, when the sun is hanging low in the heavens, and the sky is all aglow with its overflowing crimson? Where is the artist who could conceive that wide grandeur of proportion, or gain the secret of its colour? Yet it is the same but once; every evening sees a new design, a new scheme of decoration, and the only thing that is unchanging is its pervading beauty. Standing in the centre, and under the high arched roof of the forest nave, interlaced with intricate vaulting of dark wet boughs, and confined by pillars of green mossed trunks clustered irregularly in a strange weird scheme, there is but one name by which to define it—"Frozen Music!" No other phrase will express the vast gloomy aisles, the profusion of beautiful shapes, the wide springing roof showing black as the evening shadows descend, with that cold pallid blue filling up every space between the interlacing lines of bare wet boughs—"Frozen Music!" It was thus that Ruskin defined the higher forms of architecture, that Gothic which he loved so well. It is a description which relieves the mind of an overpowering oppression, for the highest forms of excellence—indefinable, without name—do oppress us with the mystery of their charm. There is sometimes a despairing lethargy born of the contemplation of great things, and if we understand this, the story of the legendary Italian painter who, conjuring up the spirit of the beautiful, wept at the awful aspect of his vision, is full of meaning to us. Thus our great cathedral window in the west is almost too humanly impossible to be without its melancholy. The eye is led to it by lines of arched vaulting rising each beyond each in an endless succession of new design; column beyond column superbly lead in the same direction. The chequered floor of changing mossy green and rich dull brown mingles in the long perspective with the overhead fretwork of boughs and dwindling pillars of gnarled beeches, whence they spring; making of the whole a hazy blur of shadow, but for the deep light and rich flaming colour shining behind.

Low in the heavens, almost level with the floor of the long aisle, which shows in places like some brilliant Byzantine mosaic, the great sun hangs. Its crimson edges are clearly defined against the evening mist, while, in front, the innumerable distant boughs show like the finest lace-work tracery against the broad red circle. This is the centre of our window, a low circular light with the long perpendicular shadows tonguing into the woods below it. Above radiate streamers of intense crimson, throwing into still stronger relief the confusion of higher branches before them. A weird intersection of lines stem the brilliance of the declining rays; yet there is a dimly felt scheme of wide design behind their confusion. Beyond them the streamers of light still shoot outward and upward, while the shadows grow longer, creeping in and thickening among the trees. The whole of the western heaven is included in our window now, with the masses of fleecy cloud burning with the red and golden beams. From the great round itself, fast sinking beneath the forest verge, through the press of branches to the open sky beyond, the light radiates with endless change. Outward from intense crimson it tones to a blushing gold, until the chill winter blue of the sky is warmed into a frail light primrose green, passing again into blue. I have often wondered why the woodland and forest should be left desolate throughout the winter. That it is so is undoubted; few visit the glades and slopes after October's mists have once descended and May's flowers not yet begun. Many avoid them because they hang wet and glistening all through the days, full of slowly shifting mist and deep shadow, and they deem them in these days but a dismal degeneration from summer glory. It is surprising how widely spread and deeply set this idea of the woods in winter has become. Few realise the uncloaked magnificence which is free from the glorious profusion of summer leafage. It was Goethe who said that "in winter we see the hand of God; in summer, his glove;" and there is striking truth in the saying. Winter shows the clear concise beauty unrobed—the nude of the world. It gives clearly the structural formation of summer magnificence. All is explained, yet still remains unintelligible. The stillness which is about the woods is full of latent force, the silence significant of latent tumult; and when this is manifested in one of winter's storms, there is nothing so grand or impressive as the giant oaks and beeches braving the wind with full front and waving arms, while the smallest spray springing from last year's fall of beech nuts is able to escape without harm. There is much that even the prosaic apostle of construction could learn here. Could he devine the secret of the strength of that small spray, or the law that makes the beeches and the oaks triumphant for a hundred winters over the storms, he would have little else to learn. But for the artist, the art worker, there are endless chances for acquiring inspiration and knowledge. Let him carry away one shape, one form of beauty, one perfect line, and reproduce it in his work, and he will have proved himself a real artist, and as such his work must show itself superior to the mass of artistic mediocrity around him. It has been ever the cry of the leaders of artistic thought, "Go to nature for your inspiration and material," but in the main it has been disregarded. Yet before we attain that supremacy in art which so many are striving for, this must be accomplished. Meanwhile, the fields and bare brown hedges lie waiting, and the woods are only retrieved from the reproach of solitude by a few wayfarers and the robins upon their outskirts, while the deer, the fox, and the badger hunt in the thickets and beneath the fern unmolested. F. B.

On Reflection.

London's New Street. The great new thoroughfare which is to be constructed between Holborn and the Strand is arousing a considerable degree of interest even in circles where questions of building and street making are not usually regarded as matters of vital concern. The boldness and magnitude of the scheme seem to have impressed the popular imagination, and many suggestions have been made with regard to various details. One matter which, judging by the correspondence columns of some of our daily contemporaries, is exercising the ingenuity of a good many people is the best name for the new street. The street names of London are a constant source of interest to the historian and the antiquarian, recalling persons, events, and conditions of life that have long since passed away; such names as "Ludgate," "Charing Cross," "Holborn," and "Paternoster Row" are concentrated chapters of history, and it is desirable that the name of the new street should have some historic value as a memorial of our own time. Many of the suggestions that have been made are not without a certain appropriateness, though we have not seen one which has the quality of inevitableness which belongs, for instance, to such a name as "Rhodesia." But some are vitiated by the fact that they will be almost meaningless to a future generation, being obvious references to persons or political events that happen for the moment to bulk largely in the public eye; while others are too fantastic to appeal to a sober-minded and matter-of-fact people. But, after all, it is not the name that chiefly matters; the great thing to which all efforts should be directed is that the new street shall be as beautiful, as dignified, and as serviceable as the highest engineering and architectural skill, backed by a generous and public-spirited municipality, can make it. A narrow thoroughfare, flanked by mean buildings, would not be rendered respectable by being called "Imperial Avenue," nor would a road after the model of the Thames Embankment, with a rotten substratum and an undulating surface, be any the less a disgrace to the metropolis if named, as one correspondent suggests, "Millenium Causeway."

The Pedestrian's Complaint. It has often been remarked that the outsider sometimes sees a defect or hindrance quicker than the specialist, as his position is a free one, and he is not hampered by any trade or professional prejudice. For years past the man in the street has been protesting against the current methods of carrying on building and repairing operations. Take, for instance, the case of a house being built at the side of the pavement. It is very usual to put up a rough hoarding about 10ft. high, with one opening left through which materials can be passed. The result is that, in the case of bricks, there is one man near the opening receiving the bricks from a man in the cart alongside the pavement, and while this process is going on the pedestrian has either to wait for a stoppage or to make a circuit round the cart in the street. In provincial towns this is objectionable enough, but in cities where the traffic is considerable and congested, the nuisance is increased tenfold. The many narrow thoroughfares of London offer good examples of this nuisance, which is nowhere more noticeable than in the Strand and Fleet Street. Both these thoroughfares have carriageways and footways of insufficient width, and it has often been a matter of great surprise to foreigners that the most important thoroughfare in the "City of the Empire" should possess such defects. During business hours the overcrowding becomes so dense that progress is retarded to a most aggravating extent, and it is therefore not desirable that a further obstacle should be introduced by men throwing bricks from a cart. Of course, houses must be built and the bricks must be taken in somehow; therefore, says the builder, what is the use of making a fuss about it. Workmen, and British workmen especially, are very suspicious of any changes in the time-honoured practices which they have been taught are infallible, and this perhaps is the reason why antiquated and inconvenient practices survive so long. For years past several alternative methods to the one now current for taking materials into buildings have been at the disposal of contractors, but opposition has been made on the ground that mechanical appliances would take the place of hand labour and would therefore diminish the numbers of workers, though the experience of the past tells strongly against such a supposition. A suggestion we might make in connection with the handling of bricks in streets is that a framework, say about 8ft. high and 6ft. wide, should be erected over the pavement at one point, to carry a platform on which a man could stand and receive the bricks from the man in the cart. This would cost but little and would only mean throwing the bricks up instead of down, while the pedestrian would not be put to the inconvenience which he experiences under the present system.

Street Excavations. While dealing with this question it might be well to refer to the altogether unnecessary frequence with which excavations and digging operations are carried on in the streets, for the purpose of laying or examining mains or pipes of one kind or another. It appears to be considered proper that on the slightest occasion the surface of the road shall be torn up and a heap of earth thrown on the side, with the result that the vehicular traffic is stopped altogether or diverted, and the pavements become covered with soil. If all mains were carried in subterranean tunnels or subways there would be no necessity for disturbing the road surface; the expense of such subways would, however, preclude their adoption in the majority of places. At the same time this wholesale street repairing, which is complained about all over the kingdom, should be stopped and a certain stricture enforced. A very absurd case occurred a short time ago in the provinces. One company was carefully laying a new street and making crossings with well-squared setts, while fifty yards or so behind were the gas men tearing up the surface to put in their pipes. This is, of course, an extreme example, but it tends to emphasise the purport of these remarks that when streets are excavated for the purpose of repairing or laying pipes every effort should be made to see that the job is thoroughly done and that provisions are made to avoid the necessity of returning to the work within a short time. Unfortunately, such prospective considerations do not at present receive much attention.

"'SPECIFICATION' is a revelation."

BRITISH PLASTERWORK, PAST AND FUTURE.*

By GEORGE P. BANKART.

(Continued from page 175, No. CCXLVI.)

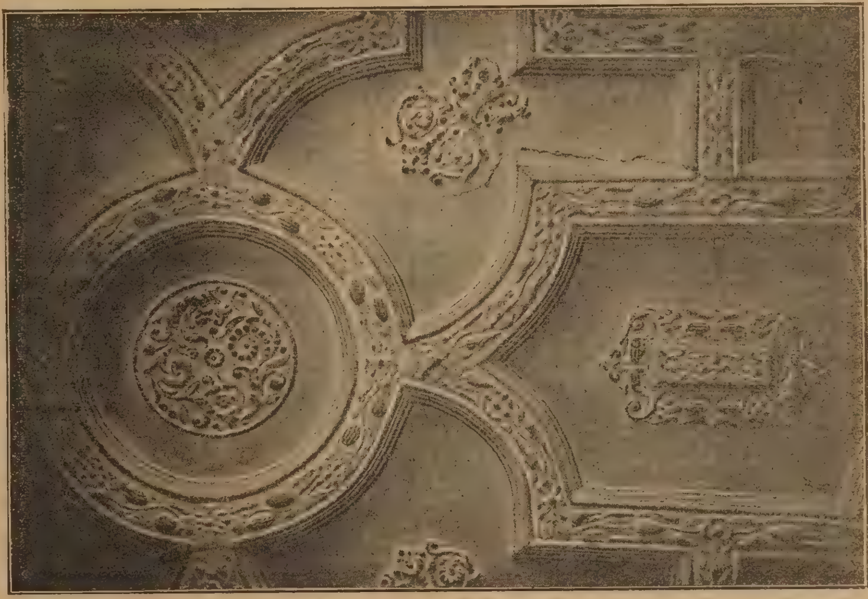
WILLIAM III. and the more settled state of affairs again revived the art, and the Italian influence flickered for a time; but, eventually, the character of the work became that of Louis XIV. and XV. of France, in which style the English workmen became proficient. Gibbs (Wren's pupil) patronised the art by encouraging the Italians, Artari and Bagutti, whose work is to be seen in the churches of St. Martin's-in-the-fields, and St. Mary-le-Strand, and also at Cambridge and elsewhere. In the meanwhile the English craftsmen were working in the French style, consisting of twisted and tangled lines of various kinds, which pleased the light glance of the French spirit, but proved offensive to the English nature. Chamber's influence helped the art again, the character becoming once more severe. Then came Joseph Wilton, Thomas and Charles Clarke (1783), whose best work is to be found in Ireland, where many good eighteenth century ceilings exist. The brothers Clarke also worked at Somerset House. Joseph Rose and his pupil, John Papworth, and Thomas Papworth, about the last survivor of the line of designers, died in 1814. Then followed the compo work of the brothers Adam, which replaced the old work in an insignificant manner, and then the nineteenth century period with centre flowers and other stuff, with which we are all too familiar.

The work of the sixteenth and seventeenth century had a charm apart from the design, which "told" in the success of the whole. The plain surfaces are not hard and die level, but full of slight undulations. The plaster itself was widely different from that we are accustomed to use now. Examine a piece of old plaster from one of these ceilings, and you will find it coarse and rough, often full of little bits of gravel and other substances which our modern "specification-architect" would probably condemn. This very roughness and coarseness give the texture to the plain work we so much envy, and it is this quality we altogether miss in our modern work. The ribs and strapwork of the old days lack that mechanical rigidity and exactitude which turns our modern men into "compasses" rather than human beings; and, again, the old work is devoid of that strain and limit of mind, born of the T-square and drawing-board, that makes everything fit with the exactitude of machinery for a working-purpose (see illustration on this page). The design will be curtailed and altered in places where circumstances would otherwise make certain forms awkward. Figures near enough for circles were turned into horse-shoes, a rhomboid would turn into a pentagon by the intersection of a wall line, and things twisted and turned to meet emergency in a manner that could not be foreseen or realised on a drawing-board or anywhere but in the place itself.

All was done, then, more by eye and hand judgment than by measured exactitude. The workmen had his tools, his models, his traditions, and was content to do his day's work at a very much lower wage than our plasterers demand now. Probably he may have had some rough plan for guidance, which was all that a good workman needed for setting out his main lines. That they had models and moulds is proved by the fact that one may not only find the same pattern in different rooms of the one house, but in different houses about the country. Bands of ornaments used in a ceiling will be found combined with another ornament in a freize somewhere else, or even filling the spandril on a wall between cornice and roof, as at Merton College, Oxford, at Hatfield. Squares, bosses, heraldic bearings, and other enrichments filling the spaces between the ribs of a ceiling, will be found combined in an overmantel or wall treatment in another room, as at Plas Mawr, Conway (see illustration). Some portions will be modelled with metal or wooden tools, some parts with the fingers, and this is evidence enough to show that the lime was then of a very different character before being worked to that with which we now cover our walls and ceilings, or no man's fingers could have worked it. The lime must have been very old and thoroughly deadened by slaking. In countless other ways the work was different to ours. Some ceilings were rendered on lathing, some on rough withies, some on reeds and rushes. The country is full of fine examples of old work, but every year some are hastened away to make room for modern material.

Present Day Plastering.

At the present day the materials readily attainable and commonly used that can be used for modelling, are, for *in situ* work, lime and ox-hair, Parian cement, selenic cement, and Keen's cement for the interior of buildings, and Portland cement and ordinary lime, sand, and ox-hair for external work. Plaster of Paris and lime putty is cheap and handy for casting and fixing purposes. None of these materials will prove so durable as the Italian "stucco-duro," nor are they capable of such fine treatment or effect, nor possess such fine modelling qualities. The stucco-duro is, however, out of the reach of ordinary persons on account of the difficulty and expense in procuring the marble dust. Nevertheless, much can be done with these common materials when worked with metal tools, or with plaster of Paris, cast in a simple way. The wall or ceiling should be treated in much the same manner for any of these materials, being first of all coated with a coarse but sharp plaster, which should be well scratched and "scoured" to receive the second and finer backing before the former is quite dry. This second coat should be of the same material as the modelling to be afterwards applied to its surface. When the second coat is set, the design is drawn in chalk on its surface, and the portion to be covered with the modelling cut away or roughened with a sharp instrument. This done, and the surface well damped with water, the modelling material is applied at will and discretion. This brings us to the most important part of our subject.



CEILING IN HOUSE AT BROMLEY-BY-BOW (1606).

It is of no little interest to note how the study of Nature influenced the art when it was first introduced into England. At that time craftsmen took their inspiration from Nature, possibly because the craft was new and held no traditions which could be followed. Whatever the cause might be, the effect on their art was the reverse of the fate of the other crafts, whose traditions were paralysed at the time of the great upheaval. The plasterers' craft was inspired with a new life and freedom, strongly akin at times to the wonderful work at Venice, and to the early Gothic work. Simplicity is the root of success in nearly all the best work of the past, as it must be of the future. In this work there are no tricks of the modern workman; all is quiet, honest, simple modelling, without any of that strain and consciousness of law and principle we are sometimes taught to obey in schools of design. There are no sharp curves, no undercuttings, or sparkle of effect that might be the natural and desirable quality of another material. On the other hand one has gentle curvature, little variety of relief, and a dullness that is the charm of a soft material, coming far short of realism, as admittedly it must and should. In old work grapes were just sufficiently like grapes to be recognisable and little more—the rest was impossible, undesirable, unnecessary, beyond the limits of material, and convention, once honourably admitted, was maintained with a vigour and spirit only possible to an honest purpose. Although the work was lacking in realism it was yet inspired from Nature so far as it went, for it at any rate expressed that freshness and vigour of growth which is the vital quality in Nature. With such limited means at hand, the plasterer contented himself (rightly) with this mere "suggestion" of nature in his work, and compromised matters between his material and the suitability of his design to the material.

So it must be with the modern craftsmen. Design will only come by designing, and by no other means, and if we can only get a certain amount of rhythm and harmony into our work, it is at least bound to be interesting, though perhaps mistaken, no matter how primitive, awkward or dull modelling may be. Dullness is, in fact, a right quality for a material such as plaster, and no more than honestly reveals the process of workmanship, by such means as pressing and adding soft material to a prepared background of a similar nature. In a material so susceptible to the slightest touch, this feeling is particularly desirable in the treatment of large surfaces.

The carver attains his result by subtraction, so the modeller should attain his by addition, economy of labour with the best possible result being an object with both, according to circumstances.

We are sometimes accused of having no "*style*" characteristic of the nineteenth century. This may be true, according to the nature of the statement, but on the other

"SPECIFICATION' has the world for its field."

hand we appear rather to have a style very far from being at all creditable to either our institutions of learning or to the public, whom these institutions are supposed to safeguard. One may perhaps feel justified in thinking that there may be a change in the future. Let us hope it will be for the better, and that we may have a national decoration founded on something else besides the Acanthus leaf, beautiful as it is. If we have no style, let it be remembered that we have a few men of sterling worth and ability who are producing work of great interest and beauty, men who may, with that help and encouragement which is their due, indirectly establish and train up a school of craftsmanship and thought that may not be despised by future generations, as ours threatens to be.

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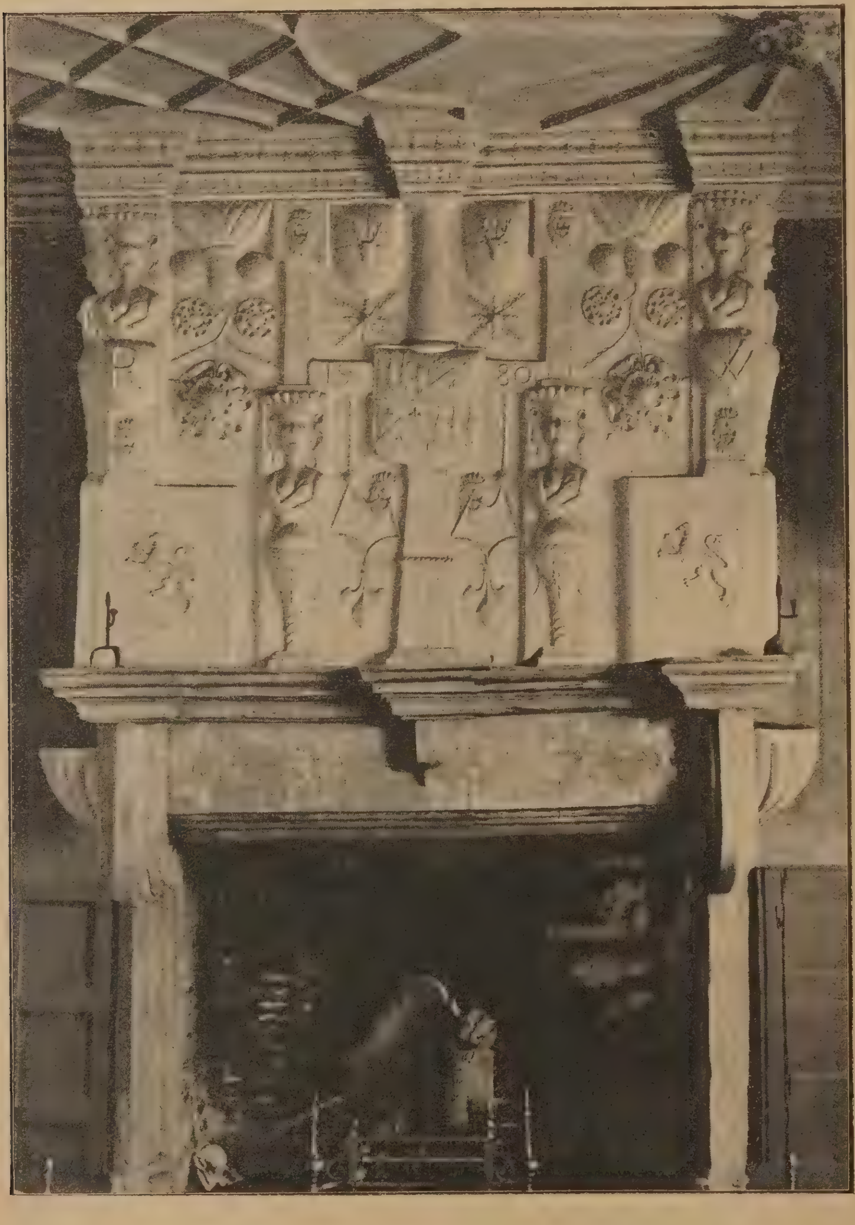
* A paper read before the Leeds and Yorkshire Society of Architects; redelivered to the Leicester and Leicestershire Society of Architects.



OVERMANTEL IN BANQUETING HALL, PLAS MAWE, CONWAY. SHOWING USE OF MOULDS FROM CEILINGS.

But this can only be brought about in one way, namely, by giving up professionalism as far as possible and getting out of the ruts which have been made for us by the "professional gentleman," by descending from our high stools and doing something real. The moment it is found that something real is being done, substantial paper design becomes less necessary, and, to a certain degree, vain and superfluous. I now address myself chiefly to those about to enter the profession, for it is to them that we must pin our hope and trust. The "profession" has become too callous and indifferent to think for one moment of trying to influence clients even to look at better things, so long as "ghosts" can be obtained to slavishly dole out designs in cut and dried styles.

We want more men of refined and strong nature working at our crafts—young men—who know the difference between design and the intellectual poverty of imitating old styles. There is plenty of demand for good individual work amongst men of a certain rank, but the supply is very limited. There is much to be desired from the plumber beyond the purely hygienic side. How many plumbers have we who can design and make a beautiful lead finial, boss, or rainwater head?

In the Middle Ages the country was full of such men, or London would never have been the "city of leaden spires." If we are again to have good work done we must draw blood from our own ranks and co-operate in craftsmanship.

There are men, now, who have been trained in "the profession" who have devoted years to the study and practice of architecture, who have abandoned professional "practice" as a failure, and are now working at some craft with great results, men whose names are household words amongst architects and artists.

And now, touching the most delicate and important part of the whole subject, that of the design of modern work.

So much wisdom and eloquence has been put forward on this subject of late years by men of undisputed genius that nothing new remains to be added. At the same time, a certain state of affairs exists that must be looked in the face and combatted again and again before a healthy reaction is possible. Far more may be achieved by doing than by talking. It is workers that we need, more than lecturers, and it is sincerity that the worker will find his most faithful accomplice. Given the worker and sincerity, they must walk hand in hand with Nature, the mother of all things. But the gift of selection, the first great gift for the designer of decoration, what of it? We must first of all throw aside professionalism, and take up the actual material. It is then we find out the helplessness of designing on paper, and the helplessness of ourselves. Being able to draw is not being able to design, and before we are able to design legitimately and naturally in any material we must have served a pupilage, or have held constant intercourse with the great works of past ages, and have learnt from them how things were done, and why. We must also be in touch with living men who practise crafts, so that their aims and their methods are familiar to us before we begin to dabble in design for ourselves.

At the present day we are deceived by our teachers, and begin at the wrong end of the journey. We are taught to believe that learning to design is one and the same thing as learning to draw designs. Set to work in a material of which you are ignorant of the capabilities, and you are soon undeceived. The consciousness of this fact compells you to set the imagination to work, and you fall back on precedent. Paper work designing is quite vain, in that it is hardly possible for one man to convey the vision or spirit of another without losing much: the essential quality in particular. The capabilities and limitations of a craft must be ours by personal acquaintance, by natural perception, the knowledge ingrained in us and born of actual hand service in the material itself, and in the art of working it. The degree of our art is according to the amount of delight we take in the creation surrounding us, and design is the expression, the impression of this delight conveyed in a harmonious manner, according to the limitations of the material selected. I would suggest then, that the true basis of future design lies in simplicity itself; that we clothe our construction, where desirable, in the simplest possible manner, yet indicative of the construction we cover; that we go to Nature for our ideas, and learn from past ages how to express them; that this expression be harmonious in arrangement, *i.e.*, decorative—suitable to the purpose, and to the position it is to occupy in the surrounding work, expressive to the highest degree of the virtues and limitations of the material in which it is expressed, and not imitative of the textures and natural effects of other materials of foreign natures.

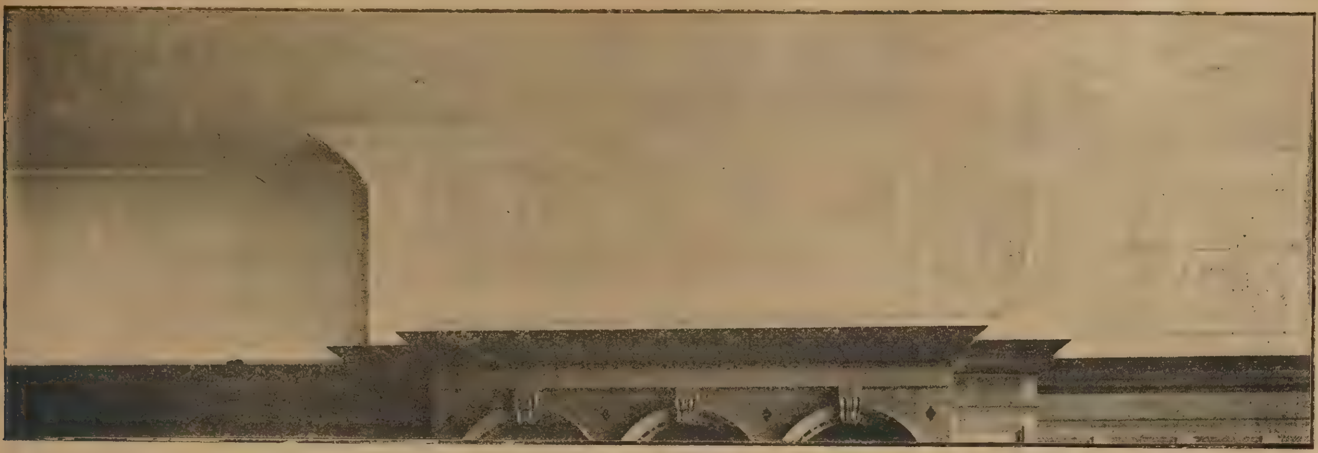
I would further suggest that our "thought stuff" be localised as far as possible; that our decoration might in some way or other be suggestive of place, surroundings, perhaps of the particular industry that might happen to be associated with the life of the neighbourhood. A village club room, or other rural building in any way associated with agriculture, might be inexpensively decorated with such subject material as rabbits, squirrels, cocks and hens, chickens, horses, men ploughing, and similar things. Buildings near the coast might even be treated in the spirit of the Fish Room at Audley End, by the introduction of aquatic forms, &c.

Flat or slightly curved bands, plain, enriched, or spotted at intervals with enrichment in either low or high relief, according to circumstances, might replace our objectionable hard "run" cornices; or cornices might be modelled in clay and cast simply moulded or slightly enriched. Such cornices are infinitely superior in appearance to those now commonly used.

Far more might be done than is done with the nice arrangement of straight lines and slightly undulating curves before resorting to the more hackneyed and convulsed forms.

Our modern decoration, as a rule, somewhat

"'SPECIFICATION' is a veritable encyclopædia."



PORTION OF FRIEZE, CHISLEHURST, KENT. DESIGNED AND MODELLED BY GEO. P. BANKART.

resembles our buildings, which so often sit uncomfortably on their site.

In short, let us look at the work of bygone craftsmen, study, reverence, and cherish it, and try to do modern work as they did. I do not say be original; there is no such thing, except so far as being oneself and reporting accurately what we see and are. All good work has been accumulative and always must be so. Each generation must base their knowledge on the last, and so build up an increasing tradition for those who follow.

But how is this to be done? I would add that the responsibility lies with you, to give that right and just encouragement and opportunity which is necessary, not only to the supply of good work, but to the possible chance of any new school of thought that might be formed, live, and flourish with proper nourishment.

Each individual is as much responsible for his actions in this respect as the mass of architects, and more is dependant on individual action than on the mass, as the mass is made up of individual action in co-operation.

It may be advanced, how are we to know when we are doing the right thing? How are we to know when we are encouraging the right men? How are we to know what is beautiful? Only so far as this, that as we are familiar with the best work of past ages and became ourselves good workmen just so far may we be qualified to judge.

Our great hope is then, that our younger members should not think the practising of a craft as unworthy of their attention, or even of their ambition, and that the craft may be brought within the reach of modest persons, suitable to its purpose, and not necessarily expensive; "for the distinction and end of a soundly-constituted man is his labour, and use is the end to which he exists."

WYCH STREET: ST. CLEMENT DANES.

By JOHN HEBB.

It is difficult to realise that the neighbourhood of Drury Lane was, in the reign of Queen Mary and down to the accession of William III., an aristocratic suburb, but such it was. Aldwych was the name of a district extending from Broad Street, St. Giles's, to the Strand, which was traversed by a street originally known as the Via de Aldwych, a portion of which is now known as Drury Lane, "for that there is a house belonging to the family of Drury," as Stow says, and the remaining portion as Wych Street. The neighbourhood was once sufficiently fashionable to be the dwelling-place of a king's mistress, for Pepys relates, in an oft-quoted entry in his diary, how, on his way to Westminster on May Day, 1667, he saw "pretty Nelly standing at her lodging door in Drury Lane in her smock sleeves and bodice" looking at a dancing milk-maid, and that she seemed "a mighty pretty creature." The name Aldwych, according to Parton ("History of St. Giles's-in-the-Fields"), appears to be a compound of the Saxon word *Ald*, old, and *wych*, a village, and plainly indicates that the locality was inhabited before the Norman Conquest, and probably gave origin to the village of St. Giles itself.

It does not appear at what time buildings were first commenced in the neighbourhood of Drury Lane, but among the St. Paul MSS. calendared by H. C. Maxwell-Lyte (Appendix to the Ninth Report of the Hist. MSS. Commission) is an acquittance of the Dean and Chapter of St. Paul's for rent issuing from a new garden lately belonging to John Bosham, adjoining his great inn in Aldewych *extra la Temple Barre*, on which three houses formerly stood, temp 6th Henry IV. (1405); from which it would seem that the district was partly inhabited early in the fifteenth century.

From the Angel Inn, at the bottom of Wych Street, Bishop Hooper was taken to his martyrdom at Gloucester in 1554.

The two houses, Nos. 45 and 46, Wych Street, on the south side of the street, of which we give an illustration in our centre plates, are good examples of London architecture of the time of James I.; they are constructed of wood, plastered externally, and overhang the street to the extent of three feet. Holywell Street, Drury Lane, Wych Street, and the adjacent streets are scheduled for the purpose of constructing the proposed new street from the Strand to Holborn, and with them will disappear many specimens of London buildings before the Great Fire.

In Seymour's "History of the Parishes of London and Westminster, 1734," Wych Street is thus described: "Wich Street begins at the Angel Inn" (the house whence Bishop Hooper was taken to his doom); "it is a street much taken up by upholsterers for the sale of bedding and secondhand household goods. In this street is New Inn, another of the inns of Chancery, and here the students of Strand Inn settled when that house was pulled down in the reign of Edward VI. for the building of Somerset House."

There is a tradition that in a narrow court out of Wych Street Jack Sheppard served his apprenticeship to Mr. Wood, a carpenter, but there seems but slender foundation for this tradition. Jack Sheppard expiated his misdeeds at Tyburn in 1724, and there is no doubt that at that date the once fashionable neighbourhood, which begun to deteriorate soon after the accession of William III., had become the resort of bad characters of every description, and that it was then a neighbourhood (as Gay sings in his *Trivia*):

> Where Calvert's butt and Parson's black champagne
> Regale the drabs and bloods of Drury Lane.

The Studio of the Late Sir Edward Burne-Jones, at the Grange, West Kensington, has been hung with about fifty of his works—some unfinished—and is now open to students and the general public on Saturday and Sunday afternoons from two o'clock till dusk. Entrance to the studio is in Lisgar Terrace, West Kensington.

PORTION OF DRAWING-ROOM CEILING AT "CLIFTON HOUSE," NEWORTH, YORK. DESIGNED AND MODELLED BY GEO. P. BANKART.

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AN IDEAL CITY.

MEETING OF THE GARDEN CITY ASSOCIATION.

IN our last issue we published an interview with Mr. E. Howard on the subject of his proposed "Garden City," which is designed to afford a healthier and happier urban life than is at present possible. The first annual meeting of the Garden City Association, which has been established to advance the project, was held at the Memorial Hall, Farringdon Street, E.C., on Thursday evening last. The chair was taken by Mr. William Woodward, A.R.I.B.A., who was supported by Mr. Branch, L.C.C., Alderman Fleming Williams, L.C.C., the Rev. Thomas Child, Mr. Henry Holiday, and Mr. E. Howard.

Letters of sympathy with the objects of the association were read from Professor Russell Wallace, Canon Barnett, Mr. Walter Crane, Dr. Paton, Mr. Holyoake, and Mr. T. E. Young.

The secretary read the report of the executive committee, which stated that twelve sections had been constituted, viz., finance, literature, lectures, and public meetings, land tenure, manufacturers and trade, co-operative societies, labour, housing, liquor traffic, education, art, music and recreation, domestic economy, and health. The finance section had now under consideration the formation of a proposal for carrying out the ultimate object of the association, and in particular the best way of obtaining funds by means of a trust or otherwise. Press notices had been very numerous, and generally favourable, although the journals had represented very diverse interests. A number of manufacturers had given their adhesion to the scheme. The committee impressed strongly upon members the absolute need of a permanent substantial income to enable the association to promote its objects and aims by educational means.

The report was carried, and the honorary officers of the association were re-elected, as also the council.

The chairman said he had for many years taken the greatest interest in all that concerned the beautifying, the health, and general well-being of the metropolis. Two projects of his were, after eighteen years' work, likely to be entered in the lists of practical completion. The first was the opening of the Mall from Charing Cross to Buckingham Palace, and the second was the street from Holborn to the Strand which the L.C.C. was now considering. Had the plan which Sir Christopher Wren prepared after the great fire of 1666 been adopted there would not be the congestion of traffic and the narrow thoroughfares which at present existed in the city of London. Mr. Howard's scheme to establish an ideal city some distance from London, which provided for the healthful recreation of the inhabitants was a combination of the ideal with the practical; and as an architect he was fully convinced that the project was perfectly capable of a profitable realisation.

Mr. James Branch, L.C.C., moved the following resolution: "That the solution of the housing problem is to be found in a well thought-out project for removing congestion in crowded centres by attracting manufacturers and others to new areas, arrangements being made for securing to the migrating people the whole increased value which their presence would give to the sites, and the areas being carefully planned so as to make adequate provision for the individual and social needs of the people, especially with a view to securing for all time the combined advantages of town and country life."

The object of the scheme, he said, was, if possible, to combine with commerce the possibility of living a happy and healthful life. He had been asked by friends why the association did not get the money required before dividing itself into committees for considering the scheme. In his opinion it would be very much better to leave the money part of the question alone at present, because even if the money was forthcoming it would be perfectly useless. The result of the committee's work must be known before it was desirable to use the money. When the proper time came and society understood the project he had not the slightest doubt that the money would be forthcoming. At the last meeting of the L.C.C. a very large sum was voted simply to clear insanitary areas. Something must be done not only to purify those insanitary areas, but to find accommodation for the people. In the poor parish which he represented there were 500 families living in one room—one room to each family. He believed that Mr. Howard's scheme was the wisest and best project for the solution of the housing problem which had yet been discovered. As to manufacturers going to Garden City, if in two or three years' time he found it advisable to extend his business he should be very glad to go and make a start in the colony. There were those in a very much larger way of business than himself who would be looking about for a position in which they could do their work successfully. A great many manufacturers were rising out of the mere drudgery of making money, and were beginning to realise that if they wanted a happy life and a successful business they must carry their workmen up with them, and to realise that in the future it would be impossible to have one man at the pinnacle and the people at the base.

Alderman Fleming Williams, speaking from his experience as an administrator, declared that some such scheme was becoming increasingly necessary on account of the terrible over-crowding which prevailed in the poorer parts of London at the present time. An enormous amount of money was being spent in clearing the ground on which these insanitary and fever-stricken dens stood. That meant that thousands of people would be turned out of their homes without any provision being made for their future accommodation. Garden City would probably be erected by private enterprise, but private enterprise dictated and controlled by a chivalous regard for the common welfare. He believed there were enough men to do it, and a great many men in prominent positions in the industrial and social world were holding back simply because they were afraid of identifying themselves with a scheme that might turn out to be a failure, owing to the indifference of the public to their true interests. But the moment they saw that there were earnest men and women behind it, who resolved to do something to diminish the hideous suffering which was crushing out the life and soul of the people—the moment they were convinced that it had behind it a moral enthusiasm, and was not likely to be discouraged by initial difficulties, those men would come forward and offer their co-operation.

Mr. Henry Holiday hoped it would be possible to secure that the buildings in Garden City should be built under the auspices and guidance of those who had made beauty and wholesomeness in houses a study. As the land on which Garden City was to be built was to be obtained for the benefit of the community that lived upon it, the foundations would be laid in the noble Divine principle of brotherhood. If the superstructure were worthy of the foundation the houses would be raised in the same spirit. The motto of Garden City ought to be: "Whatsoever things are lovely, think on these things."

Mr. Foat (Aylesbury) asked whether the mechanic who came from London to Garden City had to take enough money with him to build his own house.

Mr. Howard replied that in some cases the individual might have enough money to build his own house, but he was certain that if there was sufficient public spirit in the country to buy the land for the purpose of making the experiment proposed, there would be public spirit enough to take care that the houses were built in the very best way, and under conditions that were desirable from every point of view. The resolution was carried unanimously after a little further discussion.

Mr. F. W. Flear moved: "That this meeting pledges itself to support the aims and objects of Garden City Association." He suggested three ways by which those who were in sympathy with the association could aid it—(1) By giving their personal co-operation; (2) by making their influence felt wherever they went; and (3) by subscribing to the funds of the association.

Mr. Howard said that he hoped shortly to issue a cheaper edition of his book. He made a strong appeal to the members to have a little faith in the possibilities around them. The project could be carried out within a few months of the present time, if all were equally determined and earnest about the matter. He felt sure that great results would be accomplished within a very short time.

The meeting terminated with a vote of thanks to the chairman and to Mr. Howard.

MODEL ANSWERS TO EXAMINATION QUESTIONS.

Answers to Questions set in the Examination held by the Society of Architects in April, 1899.

BY G. A. T. MIDDLETON AND R. W. CARDEN, ASSOCIATES R.I.B.A.

(Continued from page 163, No. CCXLV.)

VI.—MATERIALS.

1.—(*a*) *Give the names of some of the principal varieties of limestone in common use. Also state which you would prefer for use at a seaside town subject to severe gales; and why?*

(*b*) *Give the names of the cements used; firstly, for exterior rendering; secondly, for exposed angles internally; and thirdly, for mortar in brickwork which has to carry concentrated loads, and the reason why.*

(*c*) *What lime would you use; firstly, for mortar to be used in exterior work; secondly, in internal plastering; and how would you test the same? How would you gauge mortar for brickwork and first-coat plastering respectively?*

(*a*) Bath stone (Box Ground, Corsham Down, &c.), Portland, Ancaster, Ham Hill, and Doulting. For an exposed situation the limestone selected should be as compact as possible. Doulting stone, used in Wells Cathedral and Glastonbury Abbey, is, perhaps, as good as any for the purpose, as it has stood the test of centuries of wind and rain with marked success.

(*b*) Cements for external rendering:—Portland cement is the most generally used, in the proportion of one of cement to three or four of sand for rendering, and one of cement to two of sand for finishing coat. This is the most economical and satisfactory method of excluding damp, &c. Roman cement also is often used in place of Portland, especially where much moulded work has to be executed, but the work is not so durable. Cement for internal angles:—Keene's cement, or Parian cement, as these are capable of being worked up so as to set very hard and will take a very sharp arris. Cement for mortar:—Portland cement, this is the best for all purposes when sufficient time can be allowed for it to set properly.

(*c*) Lime for mortar:—This should always be hydraulic, such as blue lias lime (from Lyme Regis, Watchett, &c.), these being limes which will set without the assistance of external influences. Lias lime should be used in works where great strength is required. Lime for internal plastering should be calcined from carbonate of lime containing not more than 6 per cent. impurities; these are fat or rich limes. The lime for this class of work should be run at least three weeks before it is required, so as to ensure perfect slaking. Imperfect slaking will probably entail "blowing" when the work is completed. Gauging mortar:—The mortar used for brickwork to be composed of three parts clean,

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sharp, pit or river sand to one part fresh burnt grey stone lime, well mixed together in quantities sufficient only for each day's use. Gauging first-coat for plaster work (run as mentioned above):—The coarse stuff to be of well burnt grey stone lime, sharp, well-screened, clean, freshwater river or pit sand, and good, long cowhair, free from grease and other impurities; mixed in the proportion of one of lime to two of sand with 1lb. of hair well incorporated with every 3 cubic ft. of stuff.

2.—(*a*) *State the kind of brick you would use in a first-class brick-faced building with stone dressings: firstly, for facings; and secondly, for internal work; also, how would you test the quality of the bricks in a practical way.* (*b*) *Which do you consider the best tiles to use in a building in a district subject to a heavy rainfall, and why?* (*c*) *Which are the best known green slates? How would you test the quality of a slate in a practical way?* (*d*) *Is red terra-cotta a desirable building material for outside work by the seaside?* (*e*) *What is the difference between balk timber and scantling timber? Which of the two do you prefer to use, and why?*

(*a*) For external work: Fareham red bricks or "T. L. B." Reds, or other approved makes. For internal work: Good hard well-burnt stocks of good shape, or Fletton bricks. Practical tests for bricks: When two are knocked together they should "ring" with an almost metallic sound. If the sound is dull the brick will probably be soft and not fit for use. The absorption of water should not be above 15 per cent. of the weight of brick. In shape they should be true and square with sharp arrises: when broken they should present a homogeneous texture.

(*b*) The best tiles for any position are those which will absorb the least quantity of water; consequently only those which are very dense and tough should be specified. "Broseley" tiles are generally conceded to be the best, being very slightly vitrified, and as nearly as possible non-absorbent.

(*c*) The best green slates: Elterwater, Buttermere, Tilberthwaite, and most of the slates from the Cumberland and Westmorland quarries. The best test for slates is that of absorption, which may be applied in two ways, by standing the slate on edge in water to a part of its height and observing if the water "creeps" up towards the top; or by weighing the slate before and after it has been saturated with water and noting the difference in weight; this should not exceed $\frac{1}{200}$ of the weight of dry slate.

(*d*) Red terra-cotta (if good) is as suitable for use in outside work at the seaside as any other material. Its quality depends upon the suitability, preparation, and burning of the clay of which it is composed. The surface of the finished work should be absolutely free from cracks or flaws, and each block made exactly to fit the place it is destined to hold in the building, as cutting or rubbing, after the burning of the blocks, is fatal to the durability of the material. Where dowels or clamps are used they should be of copper, and in the present case it might be advisable to cover cornices, projecting mouldings and the like with a protecting layer of lead or asphalte.

(*e*) "Balk" timber is the name applied to the "logs" (trees which have been felled and the branches lopped off) which have been roughly squared. "Scantling" timber consists of the various scantlings (planks, deals, and battens, &c.) into which balk timber is converted. Scantling timber is the best to use, being cheapest in the long run, and timber in small sizes is more easily examined with regard to its suitability for any particular position.

3.—(*a*) *Give the names of some genuine white lead used in oil paints. Which is the best, "old" or "new?"* (*b*) *What is driers, and how should it be used?* (*c*) *Is lead a good material to use for cisterns and water pipes? Give the reasons for approval or objection.* (*d*) *Describe the lead you would use for a large flat.* (*e*) *Is it advisable to use zinc soakers under lead flashings? Give reasons.*

(*a*) Genuine white leads: Krems or Vienna white, French white, London white, Newcastle white, &c. "Old" white lead is the better of the two.

(*b*) Driers are substances which, when added to oil paints, hasten the oxidation of the oil (sugar of lead, litharge, &c.). The choice of driers depends very largely upon the pigments with which they are to be used, some assimilating themselves to one pigment better than others; for instance, lead driers should not be used with oxide of zinc paint. They should never be used when unnecessary, nor, when necessary, should they be used to excess, as this retards drying. They should not be added until the paint is about to be used, and should not be added at all to the finishing coat of delicate tints.

(*c*) Whether lead is, or is not, suitable for water conveyance and storage depends principally upon the water itself. The waters which act most freely upon lead are "soft" waters (rain water, &c.); the "hard" waters having little or no effect. In the country, where the water supply is obtained from uplands, the action of the water upon lead is likely to vary at certain seasons, and in this case it would be best to avoid the use of lead for service and storage; but in localities where the water supply is known to be invariably "soft," and where the amount of plumbo-solvency remains constant, or practically so, the deleterious action upon lead may be avoided by the addition of carbonate of soda in the proportion of about one volume of the carbonate to 20,000 volumes of water. In other cases the addition of powdered chalk in the proportion of two grains per gallon of water has proved efficacious. From the above notes it is clear that lead poisoning, the only objection to the use of lead, may be easily avoided if the water supply is kept under reasonable supervision. Lead has many advantages, being easily turned round angles, easily jointed, &c., and is the best available material for the purposes under consideration.

(*d*) Lead for a large flat: The lead should be 7lb. milled lead on rough boarding, carefully dressed over wood rolls, the under-cloak covering about two-thirds of the roll and the over-cloak carried right over this and dressed flat upon the level towards the least exposed side (that is, if possible, facing an adjacent wall). The lead to be dressed up 6in. against wall, and covered with a 5lb. lead apron 6in. deep, the upper side turned into jointing of brickwork and secured with wooden wedges.

(*e*) It is not advisable to use zinc soakers under lead flashings. In the first place, while lead was being used for the flashings it is not probably that any craftsman would think of making the soakers of any other metal. The juxtaposition of lead and zinc would, with the assistance of the rain (probably accidulated in its fall through an impure atmosphere), set up a galvanic action, which in time would utterly destroy the lead, as well as the zinc.

4. *Give sketch-figured plans and sections of:—Firstly, cast iron column 10ft. long, to carry 40 tons; secondly, brick pier 10ft. high, to carry the same amount; thirdly, I steel girder, 18ft. span, to carry 12 tons, centre load and distributed load respectively. Give the working out of the same.*

Cast iron column:—A column sixteen diameters high will carry 2 tons per square inch safe load. Therefore, assume diameter at 10ft. ÷ 16, say $7\frac{1}{2}$in., metal required = 20 sq. in. Assume thickness of column at 1in., therefore mean circumference = $6\frac{1}{2}$in. Area of metal = $6\frac{1}{2}$in. × $3\frac{1}{7}$in. (ratio of diameter to circumference of circle) = $20\frac{1}{2}$ sq. in. of metal in column. Brick pier:—Safe load on stock brickwork = 4 tons per square foot. Therefore, 10 sq. ft. of brickwork are required. Therefore, a pier four and a half bricks square will suffice, as it contains about $11\frac{1}{2}$sq. ft. Steel girder:—Stress due to fixed load:

$$S = \frac{W \times l}{4 \times d} \quad \text{(Assume } d \text{ at 1ft. 6in.)}$$

$$= \frac{12 \times 18}{4 \times 1\frac{1}{2}} = 36 \text{ tons stress due to fixed load.}$$

Stress due to distributed load:

$$S = \frac{W \times l}{8 \times d}$$

$$= \frac{12 \times 18}{8 \times 1\frac{1}{2}} = 18 \text{ tons stress due to distributed load.}$$

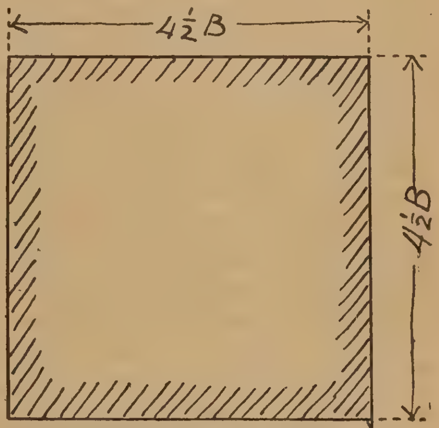
Total stress = 54 tons. At 6 tons (safe load) per square inch = 9 sq. in. sectional area.

VOLUNTARY QUESTIONS.—*A building is required as nearly as possible fireproof. What materials would you use in the same for:—Firstly, casing girders and stanchions; secondly, for floors; thirdly, for the walls; fourthly, for the roof?*

For girders and stanchions: "Salamander" (asbestos) fireproof decoration, or fibrous plaster. For floors: Concrete and steel construction, Homan and Rogers, or other fireproof floors. For walls: Brickwork or stonework, or both combined. For the roof: Steel construction and slating, or a flat concrete roof with asphalte.

A cellar is to be built near a river, and below high-water mark. What will you specify to keep the interior dry?

A Val de Travers asphalte, damp-proof course 6in. above the ground line; this asphalte to be continued vertically down against the outside of the walls to the level of the (concrete) cellar floor. At this point the damp-proof course would be carried horizontally



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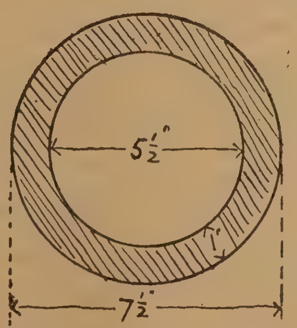
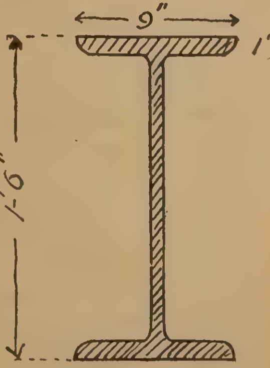


CAST IRON COLUMN



STEEL JOIST.

See other opinions on inset in this number.

through the wall to the inside of the building, and continued over the whole cellar floor.

State three kinds of materials you would use as a damp course, and which of the three you prefer.

Two courses of slate in mortar and breaking joint; Callender's bituminous damp-proof course; ½in. layer of asphalte. The latter preferred.

Views and Reviews.

THE SUNNY SOUTH.*

THIS book appears to be intended as a guide for the snap-shottist, though it contains many descriptions which are also of general interest. It is illustrated with about fifty photographs taken by the author, and a few illustrations from other sources, most of which are only of moderate merit. The half-tone block at the best is not so satisfactory for book illustration as a line drawing, being out of keeping with the type and necessitating an over-smooth paper, and, except when at the best, is very unpleasing, though one has to get used to it nowadays, when photography is the basis of most of the illustrations both of journals and magazines. In this case the block maker is no doubt, partly to blame, but the point of view has been frequently chosen too hastily, and allowance has not always been made for the great difference in strength of lighting between the upper aud lower parts of a subject when the plates were being developed—a thing which has often been the cause of vexation with plates exposed in Southern countries, where it is difficult to gauge the amount of light. (See "The Devil's Bridge, Martorell," on p. 46, for an example of the first defect, and "The Miguelete, Valencia," on p. 59, of the latter.) The former subject composes very finely from the river bed a little farther down, which one would never suppose from its awkward appearance as given. The most satisfactory illustrations are "The Cloister, St. Pedro, Gerona," p. 25; "Cyclopean Gate, Tarragona," p. 49; "The Roman Bridge at Mérida," p. 107; "Fountain at Lugo," p. 179; "Reja of the Coro, Palencia Cathedral," p. 183; and "The Retablo of St. Nicolas, Burgos," p. 195. Most of the others show either distortion or insufficient definition, though it is only right to remember that a photograph successfully made for purposes of reproduction is rarely pleasant to the artistic eye and *vice versâ*.

The authoress appears to have generally paid but hurried visits to the places she describes, and many are the small errors into which she falls. Two or three examples will suffice. She visits Montserrat, ascending the mountain by rail. Near the station she has a glimpse of the "riding path," of which she says: "It was a place where I would not trust myself on any manner of beast." What it was she saw one scarcely knows; but the "riding path" to the Monastery of Montserrat is a fine road, well graded, and broad enough everywhere for two carriages to pass each other. And at Tarragona she says: "The only entrance to the Cloisters is from the Cathedral." As the canons live above the Cloisters this is scarcely likely to be the case; and the writer remembers leaving them by a gateway at right angles to the entrance from the Cathedral and some little distance from it, a few years ago. At Murcia she saw an "industry peculiar to Murcia." This was the manufacture of thread for making nets from the bodies of silk worms. "When these are old and of no further use for producing silk" (Mrs. Main evidently has never kept silkworms) "they are placed in vinegar for twenty-four hours. Afterwards numbers of girls from the surrounding country are employed in pulling them out into fine and almost unbreakable thread," which is exported to England and other countries. At Léon the authoress was moved to express her opinion of the west front of the Cathedral, and on p. 160 suggests means for improving its design, though on p. 126 she has acknowledged that she knows "not much about architecture," so that it almost appears as if the book has been written without due consideration, or had been insufficiently revised.

In two of the latter chapters she justifies her remark in the preface that the book was written as a supplement to the guide books. At Zaragoza she refers to the crossed swords at the entrance to the Capilla Mayor of La Seo, which a Sacristan told her were the four swords with which Pedro Arbues de Epila, the ferocious inquisitor, afterwards canonised, was quartered in 1485 on the steps of the cimborio. (She does not refer to the quaint costume of the Sacristan, by the bye, who wears a ruff and a curious sort of hat, besides his flowing gown, when on duty.) And at Manresa she discovered a chapel in which was a marble figure of St. Ignatius Loyola, clothed in his own robe and girdle, and lying on its side on a sheet of glass, commemorating the eight days' trance, during which (as an inscription states) his spirit rose to Heaven, and had revealed to it the plan for the foundation of the Jesuit Order.

A. W.

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* "Cities and Sights of Spain: A handbook for tourists." By E. Main. With numerous illustrations from photographs by the author. London: George Bell and Sons, York Street, Covent Garden.

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BRITISH PLASTERWORK.

To the Editor of THE BUILDERS' JOURNAL.

BANBURY.

SIR,—I notice in your issue for last week that there is an illustration titled "External 'Pargetry,' Burford, Oxfordshire." This is a mistake; it should be Banbury, not Burford. Banbury has several most interesting pieces of pargetry-work, and amongst others a ceiling at The Reindeer Inn, moulds of which have lately been taken for reproducing it in the English rooms at the Paris Exhibition.—Yours truly,

W. S. ORCHARD.

[We are obliged to Mr. Orchard, and also to another correspondent, for pointing out this error.—ED. B. J.]

THE USES AND LIMITS OF PERSPECTIVE.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, W.C.

SIR,—A friend of mine has sent me the following note:—

"The BUILDERS' JOURNAL has a criticism of your leaderette on 'Uses and Limits of Perspective' by Henzell Ascroft; I don't know if you have seen it. He loses sight of your argument and upholds the use of a (gaudy?) perspective in order to catch clients. Then competition perspectives he upholds, assuming practically that the design selected is chosen on account of its perspective—which is grossly unfair. Later on he speaks of 'artistic merit.' Does this touch the subject under consideration, namely, *use*? 'Impossible points of view.' Often the building illustrated is in a narrow street, say, 30ft., and the point of view would perhaps have to be 60ft. away in order to avoid sharp perspective. This means the point of view being in the back yard of the opposite house. Isn't this an 'impossible point of view?'"

For my own part, I do not see that Mr. Ashcroft has done more than misunderstand me. My opinion was expressed clearly, as I thought, but men who write strongly are always open to misunderstanding of this sort.

G. A. T. M.

THE TREATMENT OF ARTICLED PUPILS.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, S.W.

SIR,—Believing that the subject of the treatment of their pupils by practising architects is one which is ripe for discussion, may I crave space for a letter which is intended rather to draw expressions of opinion from others, both principals and pupils, than to expound the writer's own view. It is a question with many sides to it. There are many principals who are content with moderate premiums and who then deal honestly with their pupils, not only giving them opportunities for becoming draughtsmen, but teaching them to the best of their ability the rudiments, at least, of all the many branches of their calling. There are also principals who demand large premiums and then allow their pupils to waste their time while grumbling at them as nuisances. On the other hand, there are pupils who use the opportunities given them to the best advantage, and, proving themselves trustworthy, are more and more trusted; and there are those who prefer to enjoy themselves, and, learning little in consequence, complain that they have not been properly taught. These things seem to be inevitable; but which is more usually at fault—master or pupil? What are the proper remedies? Is the system of pupilage a failure, and, if so, what would be preferable? If it falls short of the necessities of modern times, how can the shortcomings be supplied? These are important questions, sir, which only the opinions and the experiences of many, freely expressed, can tend to solve.—Yours faithfully,

PRINCIPAL.

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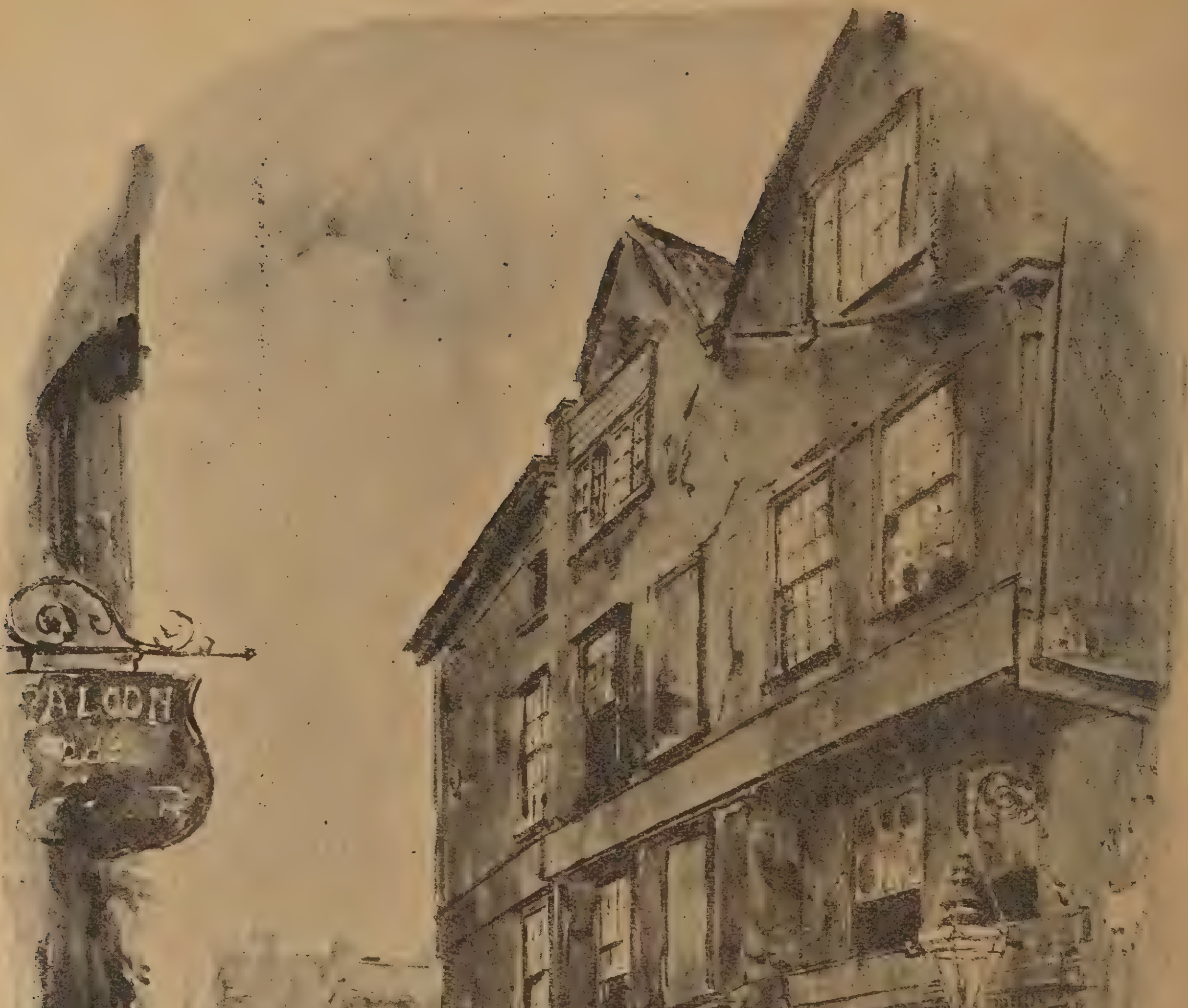

THE RISING SUN, WYCH STREET. Drawn by Hanslip Fletcher.

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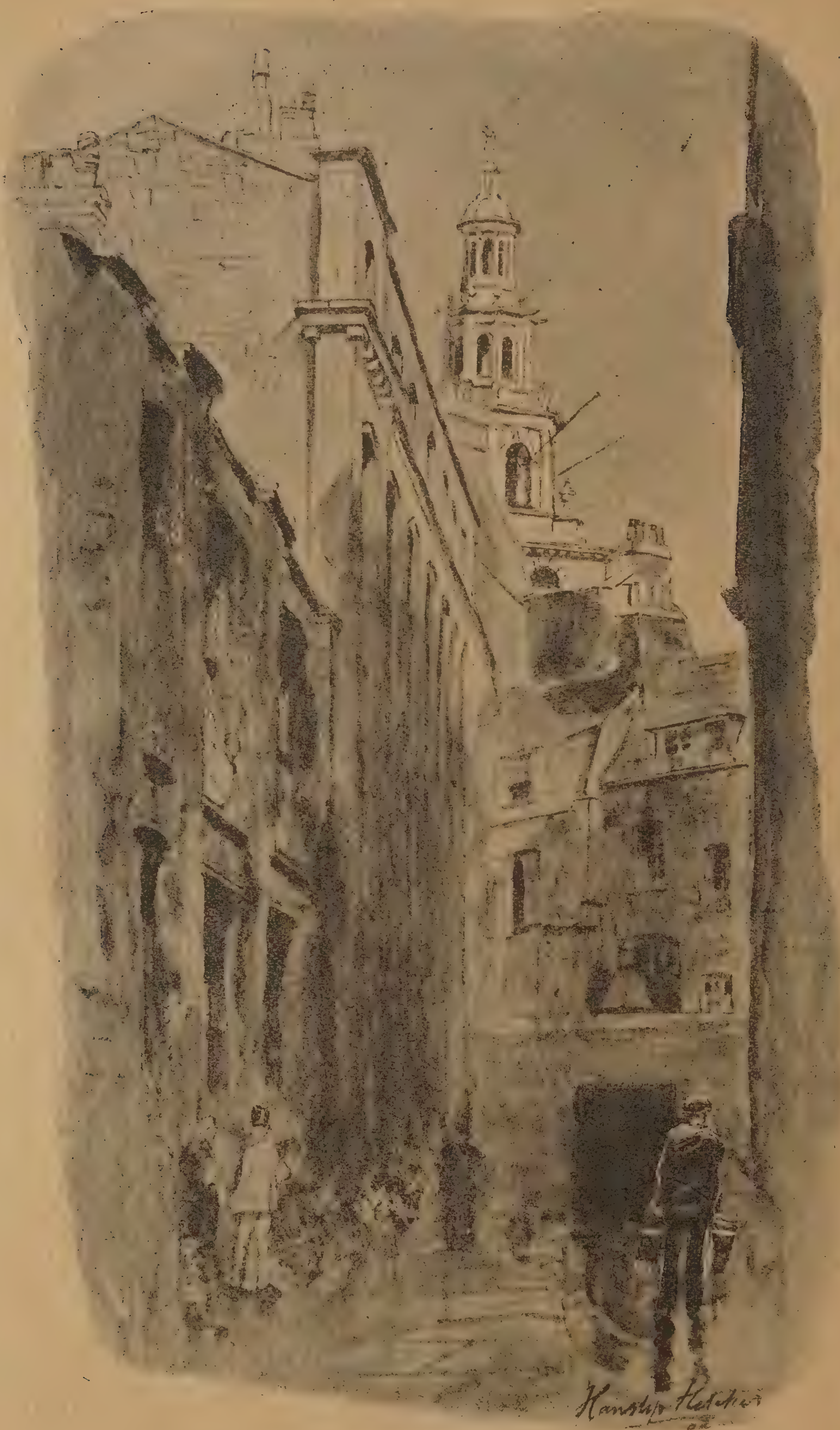
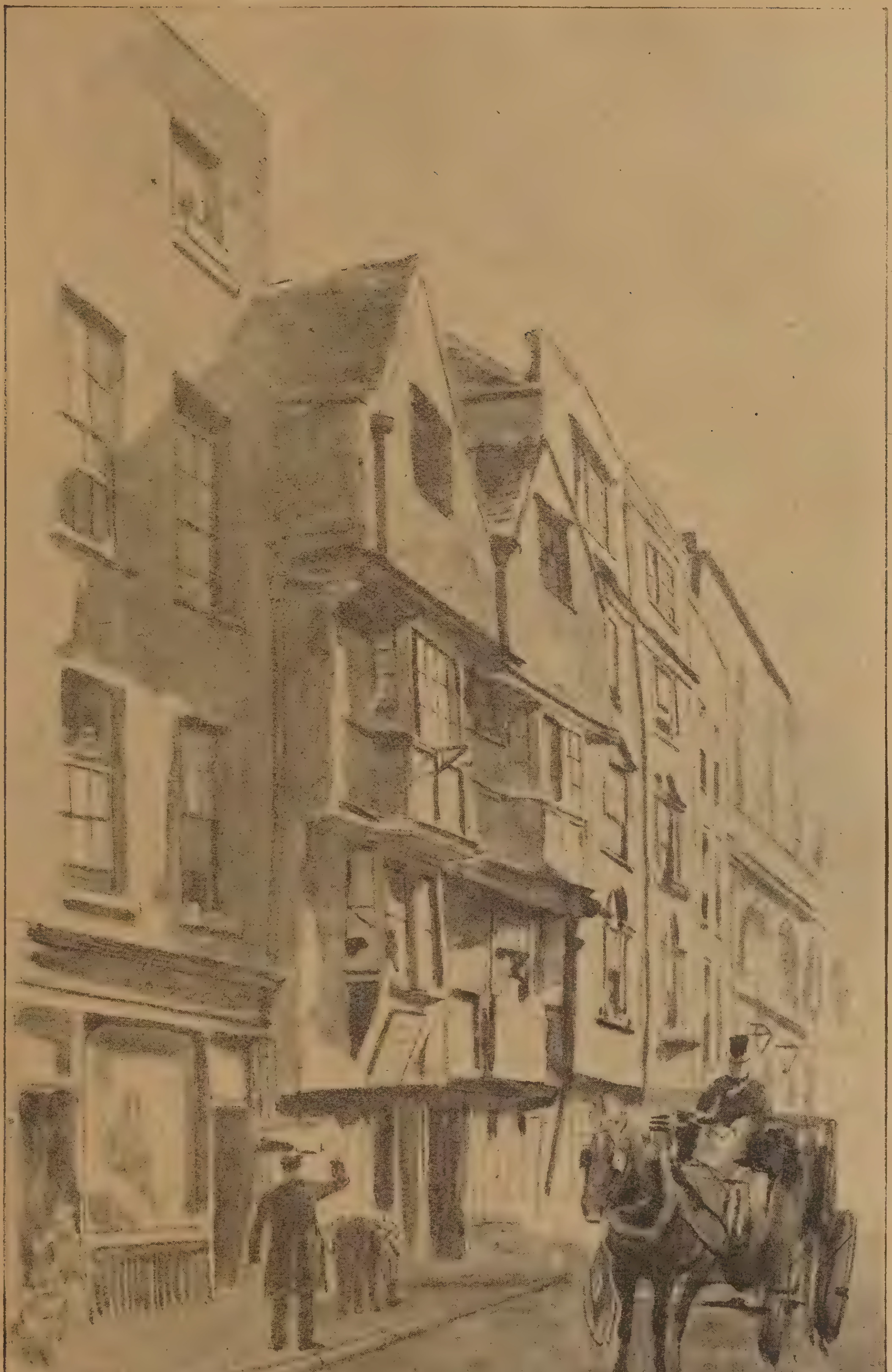


ST. CLEMENT'S DANES' SPIRE, FROM DANES INN. DRAWN BY HANSLIP FLETCHER.



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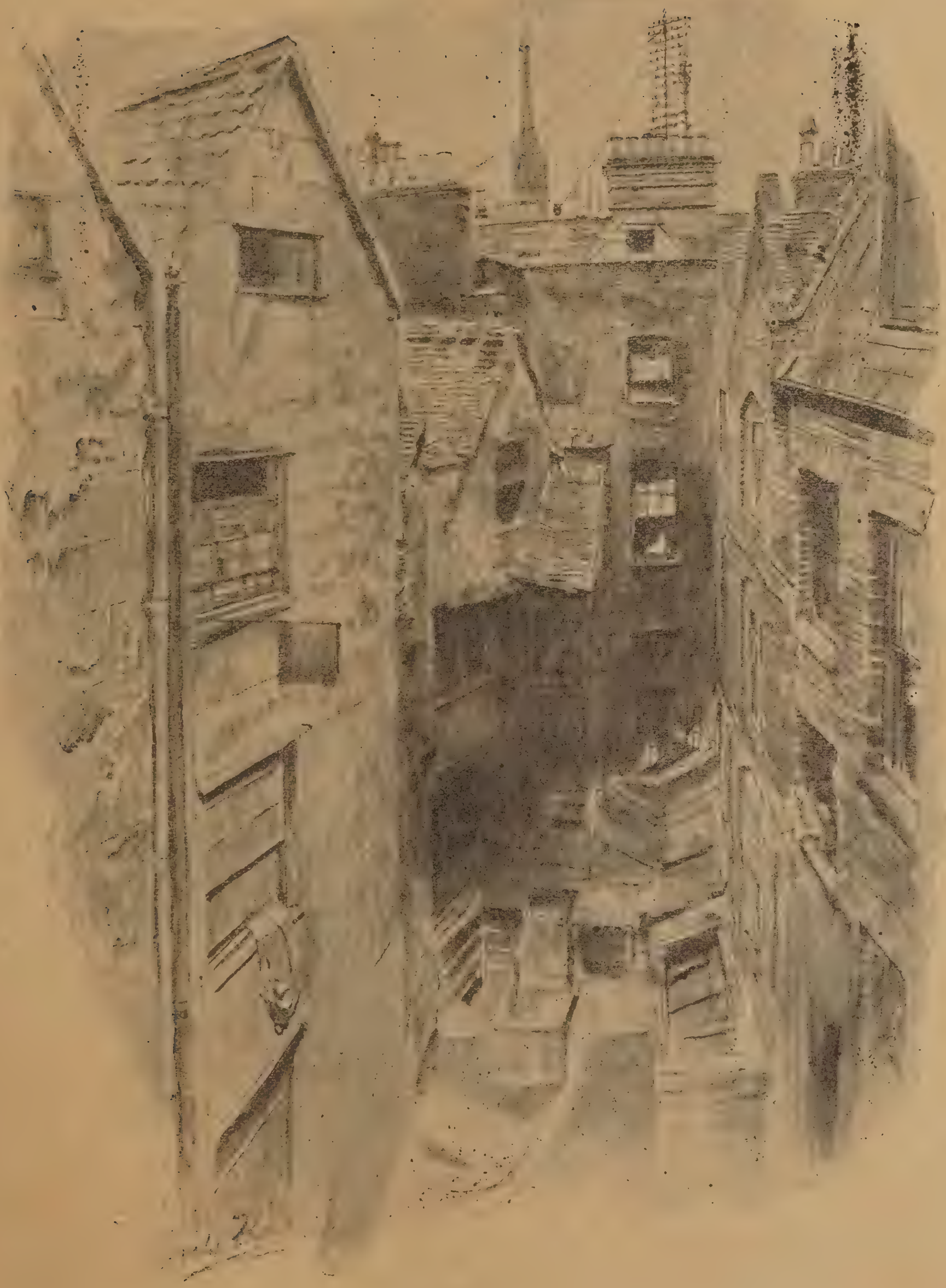
SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD WEDNESDAY NOVEMBER 1, 1899



THE BACKS OF WYCH STREET AND HOLYWELL STREET, FROM THE ROOF OF THE OLYMPIC THEATRE.

DRAWN BY HANSLIP FLETCHER.

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ARCHITECTURAL ASSOCIATION.

CIRCULAR STAIRS AND SPIRAL VAULTS.

A MEETING of the Architectural Association was held on Friday evening last at 9, Conduit Street, W., when there was a good attendance. Mr. G. H. Fellowes Prynne was in the chair. The minutes of the opening sessional meeting held on October 6th were read by the secretary and confirmed. The following gentlemen were elected members of the association:—Messrs. A. J. P. Carrington, H. C. Quérée, N. O. Searle, D. Anderson, R. B. Rowell, H. Greenby, H. R. G. S. Smallman, R. H. Dods, D. Hayworth, C. M. Crickman, W. Jackson, F. L. Atwell, R. F. Bacon, C. V. Bisley, L. F. Buckingham, S. Burgoine, W. E. V. Crompton, A. Dicken, C. P. Fleetwood, J. E. Forbes, N. Innes, L. Kaberry, C. C. Makins, F. M. Miles, G. Morland, R. H. Stone, H. F. Tasker, C. J. Thompson, A. W. Tippetts, B. D. Tracy, R. J. Tyndall, F. W. Williams, and J. MacLaren Ross. After a list of nominations had been read, the chairman formally renominated Messrs. Hart and Satchell as members of the committee. These gentlemen will be re-elected at the next ordinary general meeting. A vote of thanks, proposed by Mr. G. B. Carvill, to those who had assisted at the conversazione on October 20th, was carried by acclamation. On the proposition of the president, votes of thanks were accorded to the hon. secretaries for their labour in arranging the conversazione. The president announced that Mr. A. Wallace Rimington had kindly offered to admit members of the association free to the exhibition at the Fine Art Society's galleries in New Bond Street, W., upon presentation of members' passes for the current session. The exhibition opens on November 6th. Mr. Lawrence Harvey's paper on "Circular Stairs and Spiral Vaults" was then read by Mr. W. H. Johnson, technical instructor in masonry, as follows:—

The Paper.

The invention of circular stairs winding round a solid newel is, I believe, mediæval. I cannot say to a certainty when the first winding staircase was built; but, as far as I know, there are no precedents in either Greek or Roman architecture for that constructional feature. To my mind, the invention of the winding stair arose out of the requirements of military architecture. What was aimed at in the design of castles and fortified places was, amongst other things, compactness; for, given a certain number of men as garrison, the defence will be strong in inverse ratio to the extent of the wall to be defended. Hence followeth that all spaces that are not required as dwellings or stores should be reduced to a minimum. Amongst these spaces are the staircases. In the designing of stairs in a fortress a point of great importance is that the stairs be easily defended. All these advantages were secured by circular stairs round a solid newel. These stairs take the least room on plan. They are easily defended by one brave man against any odds, as only one assailant at a time can come to the front, and that assailant is placed unfavourably for either attack or defence, and cannot receive any support by bow and arrow or musketry from men placed behind him, as would be the case in a straight flight of stairs. It is always a matter of surprise for me to find with what directness

Mediæval Architects

found readily the best solution for the constructional problems of their time, a directness and a happiness which we only find to-day in the work of our mechanical engineers. I do not think that mediæval architects were men better gifted than ourselves, but I consider they were particularly happy in not being encumbered by architectural traditions, and in having begun their architectural career as simple workmen, either as carpenters or as stonemasons. Free from our preoccupations of re-editing certain past styles of architecture, mediæval architects saw only the constructional problems they had to deal with, and the constructional means they possessed for solving these problems. Moreover, as carpentry and masonry require certain

Geometrical Operations,

they developed in time a great power of design, combined with an equally great power of working materials into all kinds of ingenious combinations. Our modern architectural students are, I am afraid, at quite the opposite pole of the training which gave mediæval architects their unsurpassed cleverness. They are called upon to carry an enormous load of traditional architectural forms, and a minimum, not to say no, practical or geometrical knowledge whatever. As a specimen of the modern way of treating architecture, I remember a design of a law court I made in my first year of pupilage at the École des Beaux Arts. I was asked to design it in Doric Greek. How I tortured halls, chambers, and private rooms, to bring them within the frame of a Greek temple nobody can tell who has not tried his hand at a similar task. The result was not unpleasant nor even practically absurd; but I very much question whether this kind of designing is a healthy exercise for either student or even mature architect. There is less harm in re-editing Gothic architecture of any given period because this architecture is nearer to us, suits our climate, sometimes our requirements. But even then mere re-editing cannot but impoverish both reasoning powers and imagination, and I should prefer the

Mediæval Way of Becoming an Architect

—that is, obtaining through workshop practice a thorough knowledge of all the means of solving constructional problems, and through lessons given in small classes the geometrical knowledge necessary for dealing with all the forms one may require in building. This done, I should advise to go about one's work in the same spirit and way as mediæval architects—that is, design what suits best the purpose the buildings have to serve, according to the constructional means at our disposal. Geneva is particularly rich in circular staircases. Up to the end of the last century none but such staircases were used even in the noblest mansions, for Geneva was a fortified town surrounded by powerful enemies, and hence space was most valuable. These stairs are called des "Virets," a local denomination which comes from an old French verb "virer" to turn round. Amongst the oldest are, no doubt, those which lead up to the towers of the cathedral. They were built probably in the beginning of the twelfth century. Their radius is about 3ft. 8in., the newel has a diameter of about 8in., so they leave a clear space of about 3ft. 4in., which allows a person going down and one going up crossing one another on the stairs. The steps are not all of equal height. In the lower part, measured in the middle, the steps have a rise of 8in. and a tread of about 11in. There are sixteen steps to one wind, which gives an ascent of about 10ft. 8in. for one convolution. I have noticed that the back of the step as well as the riser go to the centre of

The Newel,

an arrangement which leaves very little stone where the step abuts against the newel, and one that should be discarded. In later work the back of the step is made tangent to the newel, whereas the front part still runs to the centre of the newel. In an old castle I have seen some days ago, I noticed that the back of the steps had been finished off with a chamfer, thus making an approach to a continuous ceiling as soffit of the staircase. To make a continuous soffit to a circular staircase requires a rather developed knowledge of geometrical construction so as to provide a joint which in all its parts shall form a square angle with the soffit of the step. The geometrical constructions required for

Setting Out such a Staircase

are fully explained in the number of July 31st, 1891, of the "Building News," and models of the structure have been made by my pupils in the Guilds' Institute. I may only say that once the lines have been put on, the steps are worked very easily, and have a most satisfactory effect. It is to be observed that as each step is housed in the wall, and at the other end forms part of the newel, it is desirable that the wall and the newel should bear the same weight, otherwise the steps submitted to unequal pressures would break. The newel, if not the steps, should rise, therefore, to the same height as the wall. A very good arrangement is to finish the upper part of the staircase with a fan vault resting on the newel.

Fixing New Steps.

In course of time steps are worn out, and in circular stairs new steps are very difficult to fix. To meet this difficulty, it is far better to lay the steps on the extrados of vaulted ceilings, which follow the rake of the stairs. This led to the invention of the spiral vault, called Vis St. Gilles, the construction of which is given in the number of August 21st, 1891, of the "Building News," and of which a model was made from my drawing. The voussoirs of this vault are worked on the same principle as winding handrails. As all the voussoirs of one course are identical, it is a very easy vault to construct with concrete blocks. It requires only the working of as many blocks as there are courses, and casting all the others from these models.

In a Spiral Vault the Newel is Useless,

and the vault would hold quite as well round an open well hole. In that case the vault would look better by having as section either a quarter of a circle or a quarter of an ellipse. I think it is much to be regretted that the geometrical stairs in the south tower of St. Paul's are not supported by such a vault instead of resting merely on the edges of the steps. In the Town Hall of Geneva there is an inclined road that rises to the top of the building round a square well-hole, and which rests on Gothic groins. The spiral vault may be intersected with raking arches to correspond with arches in the outer wall. This is a problem which my pupils have not attempted, but the elements of which they will find in the construction of the groining of an annular vault given in the number of August 23rd, 1889, of the "Building News." I am quite aware that the explanations I have given in this short paper are quite insufficient for helping those who have not studied

Stereotomy

in constructing even the simplest spiral vault, let alone all the beautiful combinations which can be designed. But I hope the members of the Architectural Association will find in what I have said an incentive to form practical classes for the study of descriptive geometry and stereotomy. If so I shall be glad of having written these few lines, as I firmly believe the studies I have spoken of above will have a most favourable influence on the future of English architecture.

Having read Mr. Harvey's paper, Mr. Johnson proceeded to give an explanation of the methods of constructing spiral staircases, referring to diagrams and models on exhibition at the meeting.

THE DISCUSSION.

In opening the discussion Mr. A. Bolton said he did not think the old Gothic architects set out their vaults in a scientific way, as seemed suggested by Mr. Harvey's paper; to his mind a great deal of the charm of old Gothic work was in the irregularities. Though the methods of the modern French school were certainly scientific and clever, their work was not over beautiful, and was not generally admired by architectural students. He thought the methods advocated by Mr. Harvey had to be proved to be an improvement over the old methods.

Mr. G. H. Jones was not prepared to contest the challenge put forward by Mr. Bolton, but said he felt sure that Mr. Harvey's system was one that gave good practical results. It did not always follow that an arch was the best thing to build over a void; after all it was only a lintel bent. The lintel was introduced first and the arch followed, and in some cases it was better to use a lintel than an arch. He referred to the case of the castle at Carthew in Cornwall, where a turret had sunk nearly 7ft. and swung round 2ft., but notwithstanding, there was not a crack in the masonry; and this was entirely due to the lintels holding the tower together. It therefore did not follow that a circular arch was the best form of arch for the head of a window, or anything else. The strongest kind of arch was perhaps a segmental one having a rise of about one third the span. A thorough and practical knowledge of the principles of masonry he considered to be invaluable to an architect.

Mr. G. Goodley said that Mr. Harvey had always taught that the work should be done square and featheredge avoided.

The chairman said he was bound to acknowledge Mr. Lawrence Harvey's warm enthusiasm in his work; this was always a great factor; it had carried weight in Switzerland, and must do so in England. He thought that the contention that all old theories should be discarded for newer ones was worthy of some consideration, yet we could not do better than study the architectural and constructional traditions of the past. He was glad to welcome members of the College of Masons at the meeting that night, for architects should not forget that when setting-up groins, for instance, they must make their designs capable of being worked from, and therefore the more they got in touch with geometrical theories the better; the study must be immensely useful and at the same time interesting. Very often the mason was called upon to work out the problems of some of the details which had only been indicated by the draughtsman. It was a pity that, in England, we did not take up the science of masonry as they did in some of the smaller states like Switzerland, where Mr. Lawrence Harvey now was, and he considered there was great need for Governmental help in promoting study. He hoped that by degrees there would be a large college of masons in England, as it would improve the architects' profession.

A vote of thanks to Mr. Harvey for his paper was then carried unanimously, and to Mr. Johnson for reading the paper and giving his lecture. Mr. Johnson briefly replied, and the meeting then terminated.

The next ordinary general meeting of the Association will take place on November 10th, when Mr. W. Brindley will read a paper on "Marble."

Italy exported last year 21,000 ancient and modern works of art, valued at 600,000dols. More than one-half of them went to Germany.

The Employees of Mr. John P. White, of Bedford, who makes a speciality of wood chimneypieces, held a dinner recently, when Mr. White presided.

The Church of Allhallows, Barking-by-the-Tower, has been undergoing restoration during the last seven years, according to the designs of the late Mr. Pearson, R.A. About £8,000 has been expended upon the fabric, but in order to finish the work another £2,500 is required.

Roman Relics at Chester.—During the alteration of some premises in Eastgate Street, Chester, a quantity of Roman lead piping containing an inscription was discovered. The inscription shows that the pipes were laid when Vespasian and Titus were Consuls for the eighth and ninth times respectively, and when Cnæus Julius Agricola governed the province of Britain.

The Durham College of Science, Newcastle-upon-Tyne, have just forwarded us their calendar for the session 1899-1900. The classes connected with this institution in Art, Building Construction, Plumbing and Engineering are all that can be desired, and have in connection with them a staff of well-known instructors. Mr. John Parnell Allen, P.A.S.I., is the lecturer in the Building Construction class, which is arranged with a view to preparation for the constructional sections of the examinations conducted by the Royal Institute of British Architects and the Surveyors' Institution; it also covers the syllabus of the Science and Art Department in this subject.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

SAWING PENNANT STONE.

To the Editor of THE BUILDERS' JOURNAL.

SWANSEA.

SIR,—Will you kindly let me know the best material for sawing by steam Pennant stone blocks about 7ft. square.—Yours faithfully,

D. H.

The most satisfactory material for sawing blue pennant stone is chilled shot, to be obtained from J. E. Matthewson, Bellefield Works, Sheffield. This is used in place of ordinary sawing sand, but in much smaller quantities.

F.

MARBLE MONUMENTAL WORK.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, E.C.

SIR,—Please give the address of a firm that supplies monumental work in marble, ready for the trade; I have been given to understand that large quantities come prepared from abroad.—Yours truly,

CHISELLER.

The names and addresses of many firms who supply finished marble monumental work are given in the Post Office directory. Probably S. A. MacFarlane, Limited, 149, Bishopsgate Street Without, E.C., would suit you.

WHAT TO CHARGE.

To the Editor of THE BUILDERS' JOURNAL.

NORTHAMPTON.

SIR,—What should I charge a speculating builder who wishes me to make plans for four cottages for the local authorities' approval? Should I charge by the time engaged on same, or is there a generally recognised fee for this sort of thing? I may say that the builder will not require me to do anything further than the above mentioned item.

Z.

It would be best to make an arrangement at so much per cottage before undertaking the work, which is hardly of a class that architects of any standing care to have much to do with.

G. A. T. M.

SELLING OF GROUND RENTS.

To the Editor of THE BUILDERS' JOURNAL.

HARRINGAY, N.

SIR,—Will you kindly inform me through the BUILDERS' JOURNAL if it is lawful for an architect and surveyor to occasionally sell ground rents, houses, and land and receive a commission; or is it necessary for him to have a licence for so doing?—Yours faithfully,

A. W.

I am not aware that a licence is necessary for the purpose of enabling a person to effect a private sale of land, &c., on commission. Of course, if a man acts as *auctioneer,* he must have an auctioneer's licence, and if he acts as a *valuer,* he may bring himself within the 40 G. iii., c. 43 (Eng.), 5 and 6, V. C. 82 (Ireland).

H. P. B.

FIRE ENGINE STATION.

To the Editor of THE BUILDERS' JOURNAL.

NORTHAMPTON.

SIR,—I shall be greatly obliged if you will tell me the best method of drying the hose pipes of fire engines. I propose erecting a tower to do this, with iron wall ladder inside and a gallery near top; walls to have louvre openings at intervals. What is the best position for a fire bell? As the station is a small one, I propose building a small turret on top of the suggested tower to contain the fire bell, and thus be enabled to make a good architectural feature. Are the above suggestions practical?—Yours, &c.,

B. A.

Both the suggestions are perfectly practical and practicable. We would only add that a hot water radiator at the foot of the turret would conduce to the rapid drying of the hose pipes.

G. A. T. M.

BOOKS ON BUILDING CONSTRUCTION.

To the Editor of THE BUILDERS' JOURNAL.

PLYMOUTH.

SIR,—What would be the best books for Building Construction Honours, Part II.; also for the final examination in design.—Yours sincerely,

G. C.

Building Construction Honours, Part II., consists largely of design. For working details Rivington's I. and II. will be useful, but a knowledge of design can only be obtained by practice and a careful analysis of the works of our leading architects, coupled with genuine criticism of your own efforts by some capable man.

R. W. C.

HIRING STEAM ROLLERS.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, W.C.

SIR,—Would you kindly let me know whether there are any firms who rent out steam road rollers. If so, at what rate? I should also like to know what would be the usual salary of the engineman in charge of such a roller and the consumption of fuel per hour.—Yours truly,

ENQUIRER.

There are several firms in various parts of the country who let out steam rollers on hire, and the names and addresses of some can usually be found on reference to "Results of Tenders" in the "Contract Journal." (Weekly, 6d. 139 and 140, Salisbury-court, E.C.) The rate is usually from about 3s. per hour, upwards, including the man's time and the cost of fuel. An engineman's wages would be £2 per week, or more, and the consumption of fuel would be rather more than half a cwt. per hour—say at a cost of 6d. per hour, for coke at 17s. per ton. About 200 square yards of metalled roadway can be rolled down in an hour.

G. H. B.

LANDLORD'S LIABILITIES.

To the Editor of THE BUILDERS' JOURNAL.

LLANGOLLEN.

SIR,—Will you please give replies to the following questions:—(1) Can you refer to any case or cases in which a landlord has been held liable by tenant for damages, from any disease resulting from the insanitary or defective condition of his property? (2) Can an action at law be maintained on those grounds by a tenant of an unfurnished house of any rental above £8; (3) an unfurnished house, if the rent is £8 or under; (4) a furnished house of any rental, £8 or under, or £8 and above? (5) What is the tenant's remedy? (6) What is the landlord's remedy? (7) What is the landlord's protection? (8) Can a legal instrument or agreement be executed which will relieve landlord of any or all of the liabilities mentioned, if any.—Yours, &c.

LLANGOLLEN.

(1) No. But in *Walker* v. *Hobbs* (1889), 23 Q. B. Div. 458, a tenant was held entitled under the "Housing of the Working Classes Act 1885," Sect. 12, which is in the same terms as the "Housing of the Working Classes Act 1890," Sect. 75, to maintain an action against the landlord for injuries sustained by reason of the falling of plaster from the ceiling. (2) Yes, in the Metropolis £20, Liverpool £13, Manchester or Birmingham £10. (3) Yes, I think so, on the principle of *Walker* v. *Hobbs,* referred to above. (4) Yes. On the letting of a furnished house at any rent there is an implied term that it shall be reasonably fit for human habitation. (5) The tenant can quit, pay no rent, and can bring action for damages. (6) For what? (7) Against what? (8) Yes.

H. P. B.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"O toiling hands of mortals! O unwearied feet, travelling ye know not whither! Soon, soon, it seems to you, you must come forth on some conspicuous hilltop, and but a little way further, against the setting sun, descry the spires of Eldorado. Little do ye know your own blessedness; for to travel hopefully is a better thing than to arrive, and the true success is to labour."—R. L. STEVENSON.

The New "Architectural Review." AT the present moment special interest attaches to any details concerning the work of a war correspondent, and probably the page of this month's "Architectural Review," to which many readers will first turn, will be that which contains an excellent portrait and a sympathetically written "Appreciation" of the late William Simpson, R.I. Mr. Simpson's was a varied and in some ways a remarkable career. He was a man of many parts, and an example of his artistic skill is given as a frontispiece—reproduced in colours—to this month's Review. Another interesting feature of the November number is an article on "Percy's House and the Gunpowder Plot," by Mr. J. Brownbill, M.A., in which some interesting particulars are given with respect to the house adjoining the Houses of Parliament, which was the headquarters of Guy Fawkes and his fellow conspirators. A well illustrated article on "Scottish Gardens," written by Mr. R. S. Lorimer, will prove attractive to all interested in horticulture or garden planning.

The Westminster Scheme. THE much talked of Westminster Improvement Scheme has now been adopted by the London County Council. It will be remembered that the proposal was taken up by a syndicate in 1898, but Parliament rejected their Bill on the ground that such a scheme should be carried out by public authority and not by speculators. The Council then took the matter in hand, and decided on July 4th last to apply for power to carry out the work. Two conditions were imposed. First, the Government were to undertake the widening of Abingdon Street, and, second, the Vestry of St. Margaret and St. John was to contribute £100,000. The Government have promised to do their part, and the vestry has done its best to secure the co-operation of the new municipality of Greater Westminster, which does not come into existence until November, 1900. Briefly stated, the scheme, in its latest form, consists in embanking the Thames from Victoria Tower Garden to Lambeth Bridge, widening Millbank Street by 70ft. or 80ft., buying up and clearing a large district of dilapidated and insanitary property, and making a new and dignified approach to Lambeth Bridge. At the same time the Council will acquire a large amount of land that will be let on building leases of eighty years, and an opportunity is also provided for housing on the adjoining Millbank site the population displaced by the projected improvements. Lambeth Bridge badly needs rebuilding—in fact it has been condemned as unsafe—and this could not be done properly without improving its approaches and altering the gradients to suit the new structure. The Westminster scheme is therefore a very timely one, as anyone can satisfy himself by taking a walk from the Houses of Parliament to the Tate Gallery. Of course what specially appeals to everyone—especially to Londoners—is that when the work is completed the embankment will be continuous from Blackfriars to Chelsea. With the steady and colossal growth of the Metropolis, and the consequent alterations, extensions, and improvements, one wonders what will be the extent of the embankment (or embankments) fifty years hence. Westminster itself is practically a new city, for at the beginning of the century it was three-fourths slum, while now it is the place of great buildings.

City and Guilds Institute. THE great cause of technical education has had no more zealous champion than the City and Guilds of London Institute, which now exerts a strong influence over the whole country. As the Duke of Devonshire (the Lord President of the Council) said on the occasion of the opening of the exhibition of students' work last June, the gentlemen who founded the Institute were the pioneers in the great work which was afterwards taken up by the Government, by Parliament, by the County Councils and County Borough Councils, and by other authorities throughout the kingdom. The Institute has been working in connection with the Science and Art Department for twenty years, and its object is to familiarise the student with all the processes and all the details which he will require to use in the trade he is going to undertake, and to show him how the knowledge he has acquired at lectures or in books may be applied to the practical performance of his business. During the past session of 1898-99 the total number of students in the classes registered by the Institute was 36,155, as compared with 34,990 in the previous session, and the number of candidates examined was 14,978, as compared with 14,148. The relations now existing between the Institute and the technical instruction committees, the various trade organisations, and the Association of Organising Secretaries are most satisfactory, a state of things highly beneficial to the spread of technical education on a sound basis. It is interesting to note that Manchester and Salford taken together, with a population of 754,781, have 2,648 students attending the technical classes, while London, with its population of about four millions and a half, has only 5,735. New regulations have been introduced into the Institute's programme, and in accordance with these no person can be registered as fully certificated in any trade subject who does not pass the practical test that forms part of the examination, and candidates for a certificate in Plumbers' Work must pass the written and practical examinations in either grade in the same year. A course of instruction in Builders' Quantities has been added to the syllabus and will be useful to quantity surveyors and builders and builders' foremen—the Skinners' Company offer a prize of £11 in this subject. A new syllabus has also been prepared for a two years' course in the ordinary grade of mechanical engineering. Copies of the programme of technological examinations for 1899-1900 may be obtained from any bookseller (price 10d. net), or from the publishers, Messrs. Whittaker and Co., Paternoster Square, E.C. (postage 4d. extra). The programme is not sold at the offices of the Institute.

"B(u)y Killarney's Lakes." AFTER all the poetry that has been made about the famous lakes of Killarney, it is very galling—to the poet or artist—that its name should be mixed up with that of an American syndicate who wish to "develop" the lakes. The syndicate recently wrote to notify the Earl of Kenmare that there was last season insufficient boating accommodation for tourists, and that, as part of the plan to cater largely for the tourist traffic during next summer, they proposed to place on the lakes a number of electric gondolas, for which they requested anchorage and landing accommodation at the various points of the lake controlled by his lordship. In reply, the good earl refused countenance to the proposed electric gondolas, which he said were not needed for tourists, and would certainly injure the local boatmen. His letter concluded: "The lakes, being comparatively small, are quite unsuited to electric launches rushing about, even under the euphonious name of 'gondolas.' They certainly would not lend enchantment to the scene." A meeting of the joint English and Irish Committee, appointed at the annual general meeting of the National Trust to consider the question of the Lakes of Killarney, was held recently in London, when the impending sale by auction was discussed. At the conclusion of proceedings it was decided to establish branches of the Trust in Scotland and Ireland. The lakes will be offered for sale on November 28th next, but it is to be hoped that the purchaser—if there is one—will be someone who has sufficient respect for beauty not to ruin this lovely spot for commercial or speculative ends.

Bottles for Decoration. IN the year of the outbreak of the Russo-Turkish war, there was built on the main road to Missenden, in Mid Bucks, an interesting hostelry known as the Royal Oak. It seems, however, that the builders had become so interested in the war that they thought some permanent record of it ought to be made. And so on the gable end of the house there is a singular representation, the origin of which the majority of visitors know nothing about. It consists of full-size figures of a Russian and a Turk, formed entirely of port wine bottles inserted in the flint-and-brickwork peculiar to Buckinghamshire architecture. Only the bottom of the bottles are exposed. It seems rather a silly thing to waste time and bottles in this manner—but there it is.

The Architectural Bishop. THE Bishop of London wanted some alterations to be done to the palace at Fulham, and employed a first-rate architect to inspect the building, and to consult as to what was needed to be done. The business occupied the latter three or four hours (careful man), and the bishop, on the report of the expenses, determined not to proceed. He said, however, "Be good enough to tell me for how much I shall draw a cheque on account of the trouble you have taken." "I thank your lordship—a hundred guineas." "A hundred guineas!" "Yes, my lord." "Why, many of my curates do not receive so much for a whole year's services." "Very true, my lord; but I am a bishop in my profession." The cheque was paid over in silence. This is a good story, but we seem to have read something like it before.

Leper Windows. THE leper window bogie has been a long time dying, and even now there are some who believe that the purpose of these windows was to allow lepers to see what was going on inside the church. Two churches in the East Riding—Goodmanham and Holme-on-Spalding-Moor—have recently called attention to this matter. In both there are low side windows, and in both they are so shaped that nobody outside them could see the high altar within. Mr. St. John Hope has shown that their real use was to allow the Sanctus bell to be rung outside. If the village was on one side of the church only there was only one window, and that towards the village. If the village lay on both sides of the church, as at Holme, there was a window on each side of the church. It is quite true that there were lepers in England, as the existence of lazar-houses proves, but that they were so numerous as to necessitate provision for their worship in every parish is not borne out by facts.

The Architectural Umbrella. LAST April we gave some particulars of the latest development of the Eiffel Tower and Big Wheel idea, namely, the great umbrella that was proposed to be erected at the forthcoming Paris Exhibition. The structure was to be 300ft. high, supported on an iron frame, covered with multi-tinted glass, and to have restaurants, galleries, &c., fixed at different heights on its stem. We now have great pleasure in announcing that the Exhibition authorities have decided that the idea was an absurd and impracticable one, and it has, therefore, collapsed. There are already far too many architectural abortions, and there is surely no necessity to make a special effort to add to the unwholesome list. Therefore, *à bas* all those erections, of which the would-be architectural umbrella is a shining example.

Under Discussion.

SOCIETY OF ARCHITECTS.

An extraordinary general meeting of the Society of Architects was held at 7.30 p.m. on Thursday last at St. James' Hall, Piccadilly, W., being followed by the annual general meeting. Mr. T. Walter L. Emden, L.C.C., presided. The minutes were confirmed of the extraordinary general meeting held on September 28th, when resolutions were passed that the annual subscription should be raised from one guinea to two guineas and that the time limit for payment should be reduced from twelve to six months. The minutes of the ordinary general meeting held on July 26th were read and confirmed, and, after ballot, the following new members were elected:—R. A. J. Bidwell, Singapore; F. G. Briggs, Blackburn; W. Campbell, Hanley; R. C. Edwards, London; C. Flint, Buxton; E. J. Hammond, New Brompton; H. Harrison, Newark-on-Trent; W. A. Keates, London; F. W. Richards, Lowestoft; A. Roberts, London; F. Witt, London; H. V. Wolstenholme, Blackburn; and A. W. Yeomans, Chard. The report for the year ending October 31st stated the present membership to be 583, an increase of thirty-six during the year. The Registration of Architects continued to receive the attention of the Society, and a Registration Committee had been formed to forward the proposal. The Council hoped to increase the number of provincial meetings on the registration question. The law relating to "Light and Air" was also receiving attention, and arrangements for the testing of materials were still proceeding. The prompt payment of fees was emphasized. Mr. W. R. Mallett endorsed the proposal to increase the subscription, as for some time past the society had been drawing on its reserve fund. He urged members to support the Society thoroughly. The report was adopted. The following officers for the ensuing year were then elected:—President, T. Walter L. Emden, L.C.C.; vice-presidents, Lieut.-Colonel F. Seymour Leslie, R.E., and Silvanus Trevail, F.R.I.B.A.; hon. secretary, Ellis Marsland; secretary, C. McArthur Butler; hon. corresponding secretary, Edgar Farman; hon. treasurer, H. G. Quartermain; hon. auditor, W. R. Mallett; council, Messrs. J. Bartlett, C. A. Bassett-Smith, G. E. Bond, W. Cooper, J. W. Frazer, W. R. Mallett, G. A. T. Middleton, R. L. Pearce, G. G. Pye, T. R. Richards, R. F. Valance, and J. H. Williams. Votes of thanks were given to the chairman and the secretaries for all the work they had done for the Society, and the meeting then ended.

GOTHIC SCULPTURE IN ITS RELATION TO ARCHITECTURE.

A lecture on this subject was delivered by Professor Baldwin Brown, of Edinburgh University, at the inauguration of the ninth season of lectures on art subjects at the Glasgow Corporation Galleries. He first referred to the meagre display of sculpture in the public buildings of this country as compared with those of France. This, he claimed, was not always the fault of the designer, for many of the Neo-classic buildings with which Scottish towns were so well supplied were intended by their architects to have the adornment of sculpture. There was need for a more general recognition of the principle that decorative sculpture in connection with public buildings was not a mere luxury, but should be, in its beauty and its significance, an integral part of the design. Our comparative indifference to sculpture as an element in architectural effect was of old date, being very observable when we contrasted the exteriors of our native cathedrals and abbey churches with those on the Continent, and especially with the cathedals of Northern France. The interiors of our British churches, however, went far to make up the difference, for we undoubtedly excelled our neighbours both in foliage carving, and especially in the sculptured tomb, with its recumbent effigy, its canopy, and decorative enrichment in carving and colour. The Continent had nothing to show which equalled the beautiful mediæval sculptured figures of the dead, found in such abundance, not only in the cathedrals, but in the simple village churches of our own country. The sculpture was, however, independent of architecture. To observe the two together in their due relations, it was necessary to go abroad, and there were few studies more interesting than to trace out the artistic thoughts that governed the sculpturesque adornment of one of the greater French cathedrals. The sculpture there was not only profusely displayed, but it was in very intimate connection with the fabric, and had grown naturally under the hands of a large body of workmen, all of whom were in a real sense artists. This was proved by the life and animation of the work, its variety, and the wealth in it of rich and tastefully-designed motives. Chartres, Rheims, and Amiens would supply the examples needed for study, and represented at its best the work of the Gothic sculptors of the twelfth and thirteenth centuries.

ART AND RELIGION.

The subject of Sir Wyke Bayliss's presidential address to the Ruskin Society of Birmingham was, "Art an essential element of the National Life." He considered that religion and art were two forces, spiritual and æsthetic, moving in the same plane of human life and action to the same end, the subduing of evil, against the common enemy, the world, the flesh, and the devil. But they moved under different sanctions. In its fight against the world, Art did not look to the promise of another, but to the purifying of this; in its struggle with the flesh, Art strengthened us not by deadening our senses, nor by lifting us above them, but by quickening them to a truer perception; in its conflict with evil or the devil, Art animated us with visions of beauty, of which it or he was the destroyer. If that were true, it would be seen that religion could have no formula to determine what was true in Art, any more than Art could have a formula to determine what was true in religion. Did the curate quite know, in arranging the services, how far he was acting as a priest, and how far as an artist; and did the painter in his studio, dreaming of Art as the regenerator of the world, quite realise that Art had never yet accomplished anything great except under religious inspiration of some kind? In alliance with religion Art found enough to do, for religion was the recognition of a relationship existing between us and God, by which we owed to Him the performance of certain duties, and submission to His will. Did we not submit to that will and perform those duties in a most artistic manner? We were not quite sure whether the sense of reverence which came upon us when we entered a great cathedral was reverence towards the Lord of the Temple, or the Temple itself, or the architect who built it; but, at all events, we were satisfied that the architect must have possessed fine religious feelings. Art could become religious, and still be art, but religion could not be æsthetic, or it ceased to be religion. Religion was the placing of everything in the hand of God, and a surrendering of our will to his, while Art was the taking of everything into our own hands and controlling it according to our own will. That was the difference. Art was an essential element in national life because it stood in close relationship to the great struggle which was always going on between good and evil. In that struggle Art was always taking sides. It took sides with the Greeks against the corruption of sensualism, with the north men against the brutal law of force, with the mediævalists against the cruel inquisition, and it took sides with us now against the still greater corruption and brutality and cruelty of modern commercialism. It came to our aid to-day in our conflict with the world, the flesh, and the devil, with forces greater than of old, or if not greater at least more subtle, and more adapted to our needs. Art was eyes to the blind, strength to those who were weak, gentleness to those who were strong, manhood to the youth, restitution to those who suffered wrong, greeting to those who were absent, faith to those who were doubting, hope to the desponding, charity to all. That was what Art was to us, because it was the greater and we were the less. It was one of the environments of our lives that was daily shaping them to fair or foul issues.

Professional Practice.

Bodmin.—At the County Court on October 25th, S. West, Bodmin, claimed £17 17s. 7d. from W. J. Jenkins, architect and surveyor, Bodmin. It was stated for the plaintiff that in June, 1898, he became the owner of five cottages in Prospect Place, together with a right of drainage at all times through a building site adjoining, owned by R. Roscorla, into the borough sewer, and a right of entry for mending, cleaning, and, if necessary, relaying the drain. In August, 1898, plaintiff agreed with Mr. Roscorla to permit him, at his own cost, to divert the drain, as Mr. Roscorla was about to build on the site. Defendant was employed by plaintiff as surveyor. Contrary to instructions, defendant allowed Mr. Roscorla to relay the drain behind the boundary wall to his property, and at considerable depth below the gradient of the plaintiff's cottages, and in such a position as to be accessible only at very considerable cost. It was also alleged that defendant allowed Mr. Roscorla to form a junction for draining his houses then in course of erection. Plaintiff immediately gave notice that he could not allow the drain to remain in that position, and also that he must repudiate defendant's action. Failing to arrive at a settlement, plaintiff had a drain laid by his own builders at a cost of £8 13s. 9d., which, together with fees, made up the amount claimed. It was contended for the defendant that he had no specific instructions as to the line of direction for the pipes, and was simply called in to superintend the work and see that it was properly done. His Honour Judge Granger said the agreement between plaintiff and Mr. Roscorla was as clear as it could be, and defendant ought to have read it when he had the opportunity. Judgment, with costs, for £9 14s. 9d. and solicitor's costs as taxed by the Registrar.

Dundee.—There is now being erected on a site north of Dighty Water an asylum for imbecile children. Messrs. James Maclaren and Sons, of Dundee, are the architects. The frontage will be 155ft. in length, and in three heights—three storeys in the centre, two storeys adjoining, and only one storey at the extremes. Under the base course the walls will be of bull-faced ashlar, battered on face, while above the walls will all be of square rubble, with angle-scabbled hewn work. The upper storeys will have dormer windows, and the roofs will be pavilioned. A flight of steps lead up to the main entrance, which, together with the three-light bay windows on each side, stands out about 4ft. from the line of wall above, and is surmounted by a parapet wall having moulded coping, the whole length forming a spacious balcony. A vestibule 8ft. wide runs through the depth of the building and connects with a corridor running lengthwise, giving access to the different rooms. Three day rooms, boys' and girls' hospitals, matron's room, Board room, doctor's room, and various sanitary and other offices occupy the ground floor. The floors above are chiefly occupied by bedrooms and dormitories. At the rear of the front building, and only separated from it by a corridor 6ft. wide, will be another large building one storey high. In this section will be a dining hall 71ft. long and 32ft. wide, and also the kitchen, a servants' dining room, several store rooms, baths, a mortuary, and the requisite offices. The boiler house, with a 50ft. chimney stalk, occupies the rear. The entire length from front to back is 180ft. The heating and ventilation will be effected by hot-air flues. On account of the sloping nature of the ground a considerable amount of excavations have been necessary in connection with the buildings at the back, while the ground at the front will require to be partly made up and terraced.

Hove, Brighton.—A first-class residential hotel and self-contained flats are to be erected on the site now occupied by the property known as Mill's Terrace, King's Road, Hove. The King's Road frontage will be occupied by ten shops with flats over, and the parallel side will have a frontage of 277ft. of uninterrupted sea view. The new hotel will be practically ∃ shape on plan, and the entrance will face the lawns, and be entered by a courtyard with a fountain in the centre. Flats will be arranged on the right and left wings, with passenger lifts to all floors, and it is intended that the hotel shall cater for the occupants of the flats, for whom there will also be provided a Turkish bath, an extensive laundry, stables &c. The flats will be arranged in bachelors', family, and grand suites, each of which will have a hot-water supply and goods lift. The hotel can be used separately or in conjunction with the flats, and will be fitted with all the up-to-date appliances in the culinary department, while the decorations and accommodation will be equal to those in any of the hotels in the adjacent borough. Messrs. Palgrave and Co., of Victoria Street, Westminster, S.W., are the architects for the work, which is to be pushed forward with all speed.

Newcastle.—As the result of a statement by Alderman Stephenson in 1891 that an enlargement of the asylum buildings at Coxlodge was absolutely necessary, competitive designs were invited and twenty-two sets were sent in; of these Mr. J. W. Dyson's designs were selected. The undertaking is one of the largest ever carried out by the corporation, and will cost, including everything, about £200,000. The old asylum runs east and west, and the new buildings are an extension of the same line; they are 1,700ft. long and 130ft. deep. The administrative block faces towards the north, and is built roughly in the form of an irregular triangle. At the base of the triangle there is a covered corridor connecting it with the patients' blocks placed behind the administrative block, in what is known in military phraseology as "echelon" formation. That is to say, one block is behind the block in front of it and just overlapping it at the end. Each block has two storeys, and each storey is a ward in itself, so that there are altogether eight wards in the new building, each with its own living and sleeping rooms. Stone is used throughout, and the main front is surmounted by a tower 100ft. high, with a clock in its face. A recreation room is provided 93ft. long, 48ft. wide, and 32ft. high, and has a stage 21ft. by 22ft., surrounded by a decoration in Doulton faience. On the east side of the hall is a glass-roofed corridor. The electric lamps and appliances throughout the building have been strongly protected to prevent patients tampering with them. The wards are ventilated on the Plenum system; in this, the air is drawn down a shaft, and, by means of an electric fan, is driven along a passage beneath the ward, being first taken—if the weather without be cold—over heated coils. Then, rising between the walls, it passes into each of the rooms, ventilating them thoroughly, and passes again into the outer air. The whole of the main corridor and all the cross passages have subways beneath them containing the pipes, wires, &c. An isolation hospital, chapel, mortuary, and engine house are provided in the asylum grounds. Not far from the engine house are covered reservoirs, having a capacity of 50,000 gallons; the towers have tanks holding 36,000 gallons. Details for a large building are always very numerous, and in this case the architects' drawings would cover an acre of ground. Also, 400,000 glazed bricks and 300,000 slates have been used for the building, which was begun about four years ago and is now nearly completed. Mr. Walter Scott was the contractor; Messrs. Fawcett and Co., of Westminster, supplied the fireproof floors; Messrs. W. B. Wilkinson and Co., of Newcastle, formed the concrete fireproof ceilings; and the heating and ventilating arrangements were executed by Messrs. Ashwell and Nesbit, of Leicester.

Warrington.—The Mayor of Warrington laid the foundation stone of the new police buildings on October 24th. These are being erected from the designs of Mr. R. Burns Dick, of Newcastle-on-Tyne, Mr. C. W. Davenport, of Stockton Heath, being the builder. The contract price was £22,000. The site, which was formerly occupied by the old barracks near the Bank Quay station, has an area of about 43,200 superficial feet, and the building will be of pressed bricks with terra-cotta facings; the sanitary arrangements will be thoroughly up-to-date, and the electric light will be installed. There will be two roomy courts, one for the magistrates and the other for the coroner, both on the second floor. The coroner's court faces Wilson Patten Street, and the police-court will be partly over the cells, of which there are twenty. There are special offices for the magistrates' clerk, detectives, juries, &c., and also solicitors' and witnesses' waiting rooms. The magistrates' entrance will be about the centre of the building, in Wilson Patten Street, and the court and police entrance in Arpley Street. Between the cells and Museum Street is a spacious parade room, 100ft. by 50ft., and in Museum Street are also the quarters for the inspectors and sergeants. It is expected that the work will be complete in about two years.

Keystones.

New Technical Schools at Truro were opened on October 24th.

A New Synagogue in Glasgow is proposed to be built on a site in Portland Street.

An Observatory at Lincoln is proposed to be erected in the keep of the old Castle.

The Site for Cardiff's Asylum has been chosen on the Velindra Estate. The purchase price is £206 10s. per acre.

A Rowton House at Manchester has been built in Harrison Street, Ancoats. The architects were Messrs. R. Neill and Sons.

A New Theatre at Rotherhithe has been built from designs by Mr. W. G. R. Sprague at a cost of about £40,000. It seats 3000 people.

A New Hotel near Southwold has been erected from the design of Mr. T. E. Key, of Bloomsbury and Aldeburgh, by Messrs. Kerridge and Shaw, of Cambridge.

Strand Improvement.—The sub-structure of the Hotel Cecil frontage will be completed by the end of this month. The L.C.C. are contributing £30,000 towards widening this part of the Strand.

Value of City Property.—A freehold site at the corner of Fen Court and Fenchurch Street, covering an area of 560ft. super, was sold on October 25th for £10,700, or a little more than £19 per square foot.

A New Electric Lighting Station in Edinburgh has been built in M'Donnald Road from designs by Mr. John Cooper, the borough engineer. Mr. F. A. Newington, the resident electrical engineer, has had charge of the engineers' work on the spot, and the scheme has been designed throughout by Professor Alexander B. W. Kennedy.

Excavation and Other Works at Rome.—On account of the success which has attended the excavations in the Forum, Professor Baccelto, Minister of Public Instruction, has appointed a Commission to consider the advisability of making excavations in the Forums of Trajan, Augustus Cæsar, and Nerva. Work is in progress for the piercing of a tunnel completely under the Quirinal Hill, which practically divides the city of Rome into two parts and forms a great hindrance to traffic. The whole of the tunnel will be brilliantly illuminated by electric light and will be large enough to admit two tram lines and two pavements.

Worcester Cathedral King's School has had a new block added to it at a cost of about £3,000.

Sir Alma Tadema will be entertained at dinner by his brother artists at the Hotel Metropole on November 4th.

Two Permanent Galleries at Cheltenham, adjacent to the Library and School of Art, were opened on October 26th.

A Memorial Window at Kingston-on-Thames, in the old town hall, was unveiled by the Speaker of the House of Commons on October 26th.

Llandudno's New Town Hall will cost £20,000 and the memorial stone was laid on October 26th. The architects are Messrs. Silcock and Reay, of Bath.

Pudsey Mechanics' Institute is to be extended at a cost of about £3,000—additional class rooms will be added and the Victoria Hall will be remodelled and enlarged.

Moorish Industries at the Glasgow Exhibition of 1901 will form a prominent feature. A building will be erected in the Moorish style, in which the natives will work.

The New English Art Club.—The receiving day for pictures intended for the forthcoming exhibition of the New English Art Club at the Dudley Gallery is fixed for Monday, November 6th.

A New Wesleyan Church at Hull is being built in the newly-opened Clee district from designs by Messrs. Golden and Kitchen, of Hull. The foundation stone was laid on October 26th.

A Penalty of £45 for making a Smoke Nuisance was recently imposed on the County of London and Brush Provincial Electric Lighting Company, in respect of their works at the Causeway, Wandsworth, S.W.

German Vandalism.—Four of the royal statues on the right side of the Sieges Allee in Berlin, presented by the Emperor, have been mutilated—fingers, hands, noses, &c., knocked off. No trace of the culprits has as yet been found.

M. Alfred Stevens, the distinguished painter, is now in such a hopeless condition that a committee has been formed in Paris to organise an exhibition of his works at the École des Beaux Arts. M. Stevens is of Belgian and not of English extraction. He has lived in France all his life, and fought in the Franco-German War.

In the City Hall at Dublin a handsome marble and mosaic floor has been laid down in place of the old Portland stone one, which was worn out. The centre piece is of ceramic tile mosaic, in which the ancient coat of arms of Dublin appears. Outside this centrepiece the floor is of black and green rings of Connemara marble. The border outside the columns consists of green circles. The front entrance hall has been laid in keeping with the main hall, and with the exception of the Sicilian work, all the marble has been quarried in Ireland.

The Forthcoming Van Dyck Exhibition at Burlington House promises to be as good as the Rembrandt Exhibition last winter. The flooring of the entrance hall of the building has been taken up and the two pillars flanking the stairway have been removed. Squares of white marble, so placed as to give a diagonal effect, with much smaller squares of black stone let in at the cut-off corners, have been laid down, and marble pillars will replace those that hitherto flanked the great steps. The work is under the direction of Mr. Jackson, R.A.

An International Assembly in Paris.—It is proposed to form a general and advisory committee consisting of members of the British Association, the Association Française, and of other representatives of pure and applied science, education, art, &c., with the object of promoting arrangements for an International meeting or assembly in connection with the Exposition of 1900. The acting secretaries are Professors Mavor and Geddes, who may be addressed at 5, Old Queen Street, Westminster, London, S.W., or 95, Boulevard St. Michel, Paris.

The Restoration of Thirsk Parish Church is now completed.

Selly Oak Workhouse is proposed to be extended at an estimated cost of £11,400.

The Reconstruction of Spurgeon's Tabernacle will be completed within a few months.

The West Ham Technical Institute Classes are now held in the School Board buildings.

A New Board School at Royal Hill, Greenwich, just completed, accommodates 350 boys and girls and 200 infants.

Turner's Works at the Guildhall last summer were visited by nearly 250 000 persons. The average weekday attendance was 2,654.

A new Board School at Leeds has been built in Brudenell Road from designs by Mr. W. S. Braithwaite at a cost of about £21,370.

St. Michael's, Bassishaw, behind the Guildhall, is to be demolished for safety's sake, and the Common Council has acquired the site for £36,000.

Aberystwith County School was formerly opened on Thursday last. The architect is Mr. T. E. Morgan, of Aberystwith, and the builder, Mr. Bearne, of the same place.

A Font Cover at Grantham Parish Church has been erected at a cost of £400, in commemoration of Her Majesty's Diamond Jubilee. It is 26ft. high and is of oak.

A Police Institute in Birmingham, at the corner of Dalton Street and James Watt Street, was opened on October 25th. The architects were Messrs. Ingall and Son, and the contractor was Mr. T. Johnson.

St. Dunstan's Church, Stepney, E., is about to be extensively altered and repaired at a cost of £3,500, under the supervision of Messrs. Cutts, architects. It was originally founded in 952 and the churchyard, opened as a public garden in 1884, is noticed in the "Spectator," the "Tatler," and Boswell's "Johnson."

Additions to St. Olave's Church, York.—The new vestry that has been added at the north corner of this church is 30ft. long by 15ft. wide, with doorways opening into the chancel. A separate entrance is also provided from the churchyard. The work has been carried out in Tadcaster stone from the designs of Messrs. Demaine and Brierley, architects, York, by Mr. Ullathorne, of Selby. Mr. Hodgson, of York, executed the plumbing and glazing. The cost has been about £450.

Glasgow Students' Visits.—The students attending the building construction classes at the Glasgow High School made their first visit of the season on Saturday to the Govan Burgh Chambers and to the Lyceum Theatre. Between fifty and sixty students attended, and were conducted by Mr. Russell, building committee convener, Mr. Thomson, of Messrs. Thomson and Sandilands, architects, Mr. Brown, and Mr. David Barclay, the architect of the theatre, which will cost about £40,000.

St. Agatha's Church, Birmingham.—This church, the first of two now being erected from the proceeds of sale of two churches in central positions in the city, will present an imposing front to Stratford Road, and will have a tower about 100ft. high, flanked by spacious porches. A nave of six bays, with side aisles, will lead to the chancel, which will be 40ft. deep and have a large traceried window. Mr. W. H. Bidlake is the architect, and Messrs. John Bowen and Sons are the contractors. The cost of the church is estimated at £15,000.

Sheffield Society of Architects and Surveyors.—We have received the twelfth annual report of this society, and note that it now has 116 members, and that there is a balance at the bank of £124 3s. 9d. The officers for 1899-1900 are as follows:—President, Joseph Smith, F.R.I.B.A.; vice-president, A. Smith Denton; treasurer, F. Fowler, F.S.I.; hon. secretary, W. C. Fenton, City Chambers, 14, St. James' Row, Sheffield; council, Messrs. Joseph Smith, A. Smith Denton, F. Fowler, W. C. Fenton, R. W. Fowler, E. M. Gibbs, C. Hadfield, C. J. Innocent, T. Winder, J. B. Mitchell-Withers, and J. R. Wigfull.

St. Paul's Church, Stalybridge, has just been completed by the addition of a south transept at a cost of about £1,700.

A New Railway Station at Blaenavon is to be built by the Great Western Railway Company at an estimated cost of £2,700.

A New Primitive Methodist Chapel at Kirkburn, Driffield, has been built from designs by Mr. J. Caleb Petch, of Scarborough.

A New Free Library at Plashet Park, East Ham, which has been erected at Mr. Passmore Edwards' expense, was opened on Saturday. The architect is Mr. Silvanus Trevail, F.R.I.B.A.

Ecclesiastical Art.—The Church of Our Lady of the Rosary, Marylebone Road, N.W., was opened on Sunday on the completion of the new paintings, stained glass windows, and decorations by Mr. N. H. J. Westlake.

Amersham's Historic Meeting House.—By the erection of a new Wesleyan Chapel at Amersham, the foundation stones of which were laid recently, the old Quaker meeting house, which the local Methodists have used for the last seventy years as a place of worship, will be vacant. This antiquated structure, which is at least 250 years old, was almost the earliest to be erected by the followers of George Fox, who existed in very large numbers in the district of the Chiltern Hills. John Knox visited Amersham.

The National Photographic Record Association has received 100 prints dealing with Lincoln, Shrewsbury, the rock dwellings in Staffordshire, &c., from Sir J. Benjamin Stone, M.P. (the president). Mr. T. W. Sharp has presented some valuable records of the excavations now in progress near Glossop; some prints of the old crosses at Iona have been given by Mr. P. Ridge; some of the old houses in the Strand, &c, by Mr. E. Scamell; and some of various old churches at South Mimms, Pinner, Aldenham, &c., by the hon. secretary, Mr. Geo. Scamell.

The Arts and Crafts Exhibition Society have arranged a course of lectures by members of the Society on the Arts and Crafts movement, including the "Pre-Raphaelite School" and the "Gothic Revival," and the associated topics of Crafts and Guild Pageantry and the Masque. The lectures will be delivered during this and next month, in connection with the Arts and Crafts Exhibition, now open, and will be devoted to showing the present position of the movement, its antecedents, and possible outcome. The first lecture on the Arts and Crafts Movement will be delivered by Mr. Walter Crane, Thursday next, November 2nd.

A New Altar Cross and a pair of vases has just been presented to Westminster Abbey by Lord Rosebery, in memory of the wedding of his daughter, Lady Margaret Primrose, which took place last April. The cross, which has been placed on the high altar, is the work of Messrs. Barkentin and Krall, of 291, Regent Street, London, W. It is of silver, and the entire surface is gilt, including the medallions, as otherwise these would suffer by cleaning, or if not cleaned would turn black. The base of the cross and the two accompanying vases follow the style of the large candlesticks which the Abbey already possesses, but which have hitherto been used only on festal occasions. The cross has five medallions or plaques containing figures in relief.

Reforming the By-laws.—A deputation of the R.I.B.A. recently waited upon Mr. T. W. Russell, M.P., at the Local Government Board, to lay before him the views of the Institute on the advisability of grouping the Model Building By-laws for non-metropolitan districts in England and Wales with the view to the adoption of such groups and such only as were applicable in particular localities, the establishment of a special Tribunal of Appeal, the extension of the London system of dealing with party-walls to the provinces, and other questions connected with the administration of local by-laws. Mr. Russell, although he could not hold out any hopes of immediate legislation on the subject, promised that the suggestions as far as they did not involve legislation should have the cordial consideration of the Board.

New Patents.

The following specifications were published on Saturday last, and are open to opposition until December 11th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—20,793, Adams, door closing appliances and checks. 21,343, Hawley, pressing and securing sectional blocks of timber to form rectangular or square blocks. 21,584, Homan, fireproof floors, ceilings, or the like. 22,120, Killick and Cochran, combination safety steam cock and door latch. 22,791, Kershaw, guard for surfacing or hand feed planing machines. 22,865, Little, elevators. 23,232, Lee, blowers and draught regulators for use in domestic grates or open fireplaces. 23,489, Brown, hinged sliding window sashes to open inwardly. 23,526, Woods, devices for automatically closing doors and the like. 23,724, Mountford and B. Dellagana and Co., Limited, means and their manufacture for effecting the coloured decoration of pottery. 23,792, Doyle, flushing valves. 24,381, Hiscock, sliding windows. 24,666, Ducat, tipping troughs for distributing sewage and other foul liquids on filter beds. 25,000, Thompson (*Gsell*), process for purifying waste water or sewage by precipitation. 25,400, Jewhurst, stoves or fireplaces. 25,575, Brearley, manufacture of prismatic glass refracting means. 25,808, O'Donahue and Halden, surveying instruments to be used in mines or elsewhere. 26,367, Davidson, centrifugal fans and pumps. 27,008, von Forell, manufacture of cement and apparatus therefor.

1899.—227, Taylor, manufacture of locking or fastening attachments for securing knobs to spindles. 1,258, Broadbent and Broadbent, jaws of machines for crushing or breaking stones, ores, and the like. 12,662, Taylor, means for connecting outlet pipes from closets and like places to soil or waste water pipes. 12,928, Forney, combined bolt and lock (date applied for under International Convention, November 22nd, 1898). 14,299, Brainard, fountains. 15,659, Finch, kilns for burning sewer pipes and other articles of clay manufacture. 15,789, Day (*Smart*), machines for manufacturing metal hinges. 16,221, Lake (*Peck, Bros. and Co.*), wash basins. 16,328, Dubuisson, water meters and the like. 16,800, Stewart, manufacture of lead sockets for rain, water, waste, soil, ventilating, and other pipes. 16,809, Haedicke, apparatus or device for drawing curves. 17,753, Fry, corner plates for stair steps, window sills, room floors, and like places.

The following abridged description is specially drawn up for The Builders' Journal and Architectural Record *by Messrs. Hughes and Young, Patent Agents, 55 and 56, Chancery Lane, London, W.C., who will give advice and assistance free to our readers on all Patent matters.*

9,812. Piling Timber. — Patentees: G. B. J. and J. Groves, both of the London Sawing Mills, Lawson Street, Great Dover Street, Southwark, S.E. This invention is designed for piling timber. A crane post is secured by clamps to the projecting ends of planks. The planks are then raised to the top of the pile by a lifting rope which passes around guide pulleys. A platform pivoted to an adjustable clamp is fitted to serve as a support for the planks. By means of a rope passing around a pulley the crane post can be raised as the pile rises.

14,247. Scaffolding and Staging.—Patentee: F. Knoeferl, of Oseney Crescent, Kentish Town, N. A movable cradle for builders, house decorators, &c., is suspended from two points of the building by ropes and lifting tackle so that it can be moved sideways as well as upwards and downwards. The cradle may be constructed of bars rigidly connected together, or of two parts so connected together by links that the flooring boards are always maintained in a horizontal position. The right-hand part supports the left side of the floor by a cross-bar or pivot, while the left half supports the right hand part of the floor on a similar cross-bar or pivot. The suspending lines are attached to eyes at the upper end of the bars.

14,283. Moulding Bricks.—Patentee: F. C. Norris, of Griswald House, Detroit, Michigan, U.S.A. Moulding-presses for bricks made from sand and a binding-agent. The mould has movable sides and ends, which are drawn out of contact with the bricks before it is ejected. In the drawings accompanying the specification a plan is shown of a mould composed of four parts, which by means of a rotary casing and toggle-levers are moved away from or towards one another. The casing for these purposes is rotated from a spindle by means of rods. A lever on the lower end of the spindle engages with a grooved cam on the shaft. The feed-slide is moved over the mould by a lever engaging with a cam groove in the driving wheel, and during its forward stroke removes from the plunger the previously formed brick. A cam operates the bell crank to raise and lower the collar secured to a pair of rods carrying the upper die, while a second cam actuates a toggle-joint by which the plunger is operated. A spring attached at one end to the collar tends to keep the joint closed, this closure being limited by a stop.

14,304. Preventing Dampness of Plaster. — Patentee: C. Fleisch, of St. Johann-on-the-Saar, Germany. The object of this invention is to prevent dampness of the plaster and exudation of moisture on the surface. Pulp boards, such as used for roofing purposes, are covered on both sides with a hot bituminous mixture of asphalte, petroleum, sand, ashes, &c., and nets of hemp, jute, or similar material are stretched over the outer faces to retain the plaster. The edges of the nets are secured to the back edges of the board by a second layer of the hot bituminous mixture. The boards may be roughened or grooved by pressing them between grooved rollers or plates. When nailed to the wall, air spaces are formed between the boards and the wall, and perforations may be made through the boards to allow moisture to escape. The boards may be applied to existing buildings by removing the damp plaster, nailing the boards in place, and plastering them over.

14,394. Slabs for Building and Decorative Purposes.—Patentee: W. Anthony, of Trier, Prussia. Relates to the manufacture of metal faced slabs for use as wall and ceiling coverings, and to the making of doors, furniture, partitions, &c. Asbestos boards are coated with water glass and sprinkled with glass or emery powder. When quite dry, metal plates are attached under pressure by cement composed of casein, hydraulic lime, chalk, emery powder, and burnt magnesia. The edges of the boards are then coated with some waterproofing material, and the edges of the metal plates, which were left projecting, are then turned down. Slabs that are to be subject to water or moisture are steeped in a bath of chloride of magnesia dissolved in alcohol before being coated with the water glass. If the slabs are required to be highly fire-resisting, steel plates only are used, but otherwise, softer metals such as zinc, nickel, aluminium or brass may be employed.

A New Methodist Church at Handsworth is being built from the designs of Mr. J. G. Dunn, by Mr. T. Ewins. The total estimated cost is £4,500.

An Eel in a Service Pipe.—The water supply to the Constitutional Club in Northumberland Avenue, London, was suddenly cut off a few days ago, and it was discovered that an eel, weighing 2½lb., had become firmly wedged in the service pipe leading to the meter, thus completely shutting off the water supply. It was nearly four hours before the mischief could be remedied.

New Companies.

Oliver Goddard and Co., Limited.

This company was registered on October 17th by Mann and Crimp, 17, Essex Street, Strand, with a capital of £5,000 in £1 shares, to adopt an agreement with O. J. Goddard, and to carry on business as dealers in bricks, tiles, terra-cotta, timber, china; to acquire and turn to account any real or personal property, concessions, patents, machinery, ships, barges, rolling stock, plant, and stock in trade; to negotiate loans, &c.

Gypsine Brick Company, Limited.

This company was registered on October 20th by Cheston and Sons, 1, Great Winchester Street, E.C., with a capital of £1,800 in £1 shares, to acquire and work patents and secret processes for the manufacture and production of bricks, slabs, planks, or blocks suitable for building purposes; to adopt an agreement made between this company with E. Glaenzer; to develop and extend the said business; and as claypit owners, brickyard and mill owners, engineers and machinists, &c.; and to acquire and turn to account any real or personal property.

Midland Plastering Company, Limited.

This company was registered on October 19th by Leman and Co., 73, Basinghall Street, E.C., with a capital of £10,000 in £1 shares, to carry on in all or any of the respective branches the businesses of plasterers, lime and cement workers, quarry owners, stone merchants, lime owners, brick, tile, and terra-cotta makers, timber merchants, sawmill proprietors, general engineers, electricians, ironfounders, wire-workers, &c.; to acquire and turn to account any lands, estates, real or personal property, patents, patent rights, &c. The directors are to be elected by the signatories. Qualification, £100. Remuneration, £50 per annum each.

Fowey China Clay Company, Limited.

This company was registered on October 18th by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £25,000 in £1 shares, to acquire, upon the terms of a certain agreement, the businesses of china-clay and stone merchants, as now carried on under the respective styles of A. Lechenich and Co. and the Fowey China Clay Company, Limited, at Fowey, Cornwall, and to carry on the business of workers of and dealers in china, porcelain, fire-clay, brick and tile makers, terra-cotta ware; as papermakers, chemical manufacturers, glue makers, &c. There are to be not less than two nor more than five directors. Managing director, A. C. A. Lechenich.

Anglo-French Syndicate, Limited.

This company was registered on October 17th by Ingle, Holmes and Sons, 20, Threadneedle Street, E.C., with a capital of £30,000 in 29,900 £1 ordinary shares and 2,000 1s. deferred shares, to carry on the businesses of miners, metallurgists, builders, contractors, engineers, farmers and graziers, shipbuilders, shipowners, wharfingers, carriers, warehousemen, hotelkeepers, storekeepers, merchants, importers and exporters, and to deal in property of all kinds; as bankers, financiers, company promoters, concessionnaires; to construct and maintain rail and tram roads, &c. The directors are to be elected by the signatories.

Thomas Crawshaw, Limited.

This company was registered on October 16th by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £5,500 in £1 shares, to carry on in the United Kingdom or elsewhere the business of shuttle, spring, peg, and tag manufacturers, box, packing case, and pattern makers, timber merchants, joiners, builders, undertakers, contractors, patent fuel manufacturers, corn grinders, seed crushers, oil cake manufacturers, general mill furnishers, match manufacturers, &c.; to acquire and turn to account any patents, patent rights, &c.; to establish and maintain gas and electric works; as builders and contractors, &c. The directors are to be elected by the signatories. Qualification, £250. Remuneration, £25 per annum each.

COMING EVENTS.

Wednesday, November 1.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and Demonstration in the parish of St. George, Hanover-square, at 2 p.m., conducted by Mr. Albert Taylor, chief sanitary inspector. J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of members. 8 p.m.

Royal Archæological Institute of Great Britain and Ireland.—(1) Judge Baylis, M.A., on "An old Doorway and Staircase recently found in the East Wall of the Inner Buttery of the Inner Temple." (2) Mr. F. J. Haverfield, M.A., on "The Sepulchral Banquet on Roman Tombstones." 4 p.m.

British Archæological Association.—(1) Mr. C. H. Compton on "The Recent Discoveries at the Tower." (2) Mr. A. S. Walker on "The Guildhall Porch." 8 p.m.

Institute of Sanitary Engineers (Incorporated.)—Election Committee, 2.30 p.m. Council meeting, 2.30 p.m. General Purposes Committee, 5 p.m.

Thursday, November 2.

Worshipful Company of Carpenters.—(Lectures on Sanitary Building Construction.)—Mr. Keith D. Young, F.R.I.B.A., on "Principles of Ventilating and Warming Buildings." 7.30 p.m.

Arts and Crafts Exhibition Society (New Gallery, Regent-street, W.).—Mr. Walter Crane on "The Arts and Crafts Movement; its general tendency and possible outcome." 8.30 p.m.

Friday, November 3.

Architectural Association.—(Discussion Section.)—Mr. G. H. Smith on "Brasses." Mr. E. Swinfen Harris, F.R.I.B.A., will attend as special visitor. 7 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. W. C. Tyndale, M.I.C.E., on "House Drainage." 8 p.m.

Institution of Junior Engineers (Westminster Palace Hotel). — Presidential address by the Hon. Charles A. Parsons, F.R.S. 8 p.m.

Saturday, November 4.

Dundee Institute of Architecture.—Mr. P. H. Thoms on "Art in the Home."

Sanitary Inspectors' Association.—Extraordinary General Meeting at Carpenters' Hall, London Wall, E.C. Inaugural address by Mr. W. H. Grigg, chairman of Council. 6 p.m.

Monday, November 6.

Royal Institute of British Architects. — Mr. William Emerson, President, will deliver his opening address of the Session. 8 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers).—Mr. Charles Jones, M.I.C.E., on "Scavenging and Disposal of House Refuse." 8 p.m.

Society of Engineers.—Mr. Sherard Cowper-Coles on "The Electrolytic Treatment of Complex Sulphide Ores." 7.30 p.m.

London Institution.—Professor W. Boyd Dawkins, M.A., F.R.S., on "The Place of the Welsh in the History of Britain." (Illustrated.) 5 p.m.

Wednesday, November 8.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and Demonstration at Common Lodging House. Prof. Henry Robinson, M.I.C.E., on "Sewerage and Sewage Disposal."

Edinburgh Architectural Society.—Mr. Robert Wilson on "The Planning of Schools." 8 p.m.

Thursday, November 9.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers).—Demonstration of Book-keeping as carried out in a Sanitary Inspector's Office, in the Parkes Museum at 8 p.m., by Mr. Albert Taylor.

London Institution.—Professor W. M. Flinders Petrie, D.C.L., on "Prehistoric Egypt." (Illustrated.) 6 p.m.

Arts and Crafts Exhibition Society (New Gallery, Regent-street, W.).—Mr. H. Wilson on "The Pre-Raphaelite School in Relation to the Revival of Design and Handicraft." 8.30 p.m.

Friday, November 10.

Architectural Association.—Mr. W. Brindley on Marble." 7.30 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. Reginald Dudfield, M.A., M.B., on "The Practical Duties of a Sanitary Inspector." 8 p.m.

Saturday, November 11.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and demonstration at the Sewage and Destructor Works, Ealing, at 2.15 p.m., conducted by Mr. Charles Jones, M.I.C.E.

Improving the Coventry Streets.—At the last meeting of the Coventry City Council the General Works Committee presented a report recommending the Corporation to obtain powers in the next session of Parliament to carry out several important street improvements. It is proposed to acquire a large number of properties with the view of widening some existing thoroughfares, and making a new street from Gosford Street to the railway station. In the centre of the city, where new municipal buildings are to be built, it is intended to continue the widening of Earl Street up to Hay Lane, and to acquire property in the lane and also in Bayley Lane. St. Michael's Baptist Chapel is also scheduled for acquirement. The Council adopted the Committee's report.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

BARKING (Essex).—For additions to school, Gascoigne-road, for the School Board. Mr. C. J. Dawson, architect, East-street, Barking:—

Reed and Son	£5,750	Davies and Leaney ...	£4,800
Godfrey and Son... ...	5,624	Garbett	4,725
Knight and Son	5,243	Shelbourne and Co., Southend-on-Sea* ...	4,570
Critcher	5,211		
Carter	5,120		

*Accepted.

BIRMINGHAM.—For the erection of new depôt, public offices, etc., Stratford-road, Sparkhill, for the Yardley Rural District Council. Mr. Arthur Harrison, architect, Queen Chambers, Colmore-row, Birmingham. Quantities by Mr. Anthony Rowse, 3, Newhall-street, Birmingham:

Harley and Son ...	£11,545	Whitehouse and Sons	£10,986
Moffat and Sons ...	11,380	Whittall and Son ...	10,860
R. Fenwick	11,095	F. Davis...	10,782
F. J. Briley	11,085	W. Bishop, King's Heath (accepted) ...	10,687
Bowen and Sons ...	11,065		
H. Gibbs	11,029		

BRIGHTON.—For the construction of engine and boiler-house, &c., Mill Oak Pumping Station, Portslade, for the Town Council. Mr. F. C. May, Borough Engineer, Town Hall, Brighton:—

R. R. Berry	£10,631	Sattin and Evershed ...	£9,568
A. E. Nunn	10,240	Longley and Co., Crawley (accepted)	9,449
Kirk and Randall ...	9,885		

BRIGHTON.—For the erection and completion of a pair of semi-detached villas in the Tivoli-crescent, Dyke-road, Brighton, for Mr. F. J. Foulger. Mr. H. M. Nye, architect, 47, Hova-villas, Hove:—

H. J. Penfold	£1,817	S. C. Smale	£1,384
W. Humphrey	1,600		

BURTON-ON-TRENT.—Accepted for the erection of No. 2 block of artisans' dwellings, for the Burton-on-Trent Artisans' Dwellings Company, Limited. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent. Quantities by the architect:—

Henry Edwards	£3,937 10

CARDIFF.—For the erection of a branch library, Roath, for the Corporation. Messrs. Teather and Wilson, architects, Queen-street, Cardiff. Quantities by the architect:—

Jerrard Hallett	£2,960	A. J. Howell...	£2,675
F. Williams	2,900	W. T. Morgan	2,603
Thos. Evans	2,882	Knox and Wells	2,566
Shepton and Son... ...	2,775	Thomas and Sons ...	2,560
Williams and Thomas	2,750	Marsh and Wride ...	2,525
Turner and Son	2,728	Chubb and Co., Cardiff (accepted)	2,468
Evans and Bros.	2,700		

CLUTTON (Somerset).—Accepted for the erection of forty miners' cottages at Greyfield Colliery, for the Right Honourable Earl of Warwick. Mr. William F. Bird, architect, Midsomer Norton, Somerset. Quantities by the architect:—

Tom Keeling, Timsbury, near Bath	£6,360

CROMFORD (Derbyshire).—Accepted for the construction of a Wesleyan Chapel and school premises. Mr. William F. Bird, architect, Midsomer Norton, Somerset. Quantities by the architect:—

William Boden, Matlock Bank	£1,927

ILFORD.—For the erection of Downhall school, for the School Board. Mr. C. J. Dawson, architect, 7, Bank-buildings, Ilford. Quantities by Messrs. Gardiner and Theobald:—

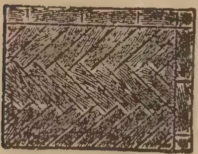
Gregar and Son... ...	£26,545	Dearing and Son ...	£24,060
Knight and Son ...	25,997	W. Shepherd	23,845
Shillitoe and Son ...	25,000	Hockley and Son ...	23,800
Reed and Son	24,990	Hammond and Son, Romford*	21,802
Rider and Son	24,130		

* Accepted.

ISLEWORTH.—For erecting new workhouse at Isleworth, for the Guardians of the Poor. Mr. W. H. Ward, architect, Birmingham. Quantities by Mr. F. W. Miller, London:—

Leeder and Co.... ...	£133,033	Pattison and Sons ...	£90,000
Shillitoe and Son ...	103,400	W. Wisdom	87,000
Cowley and Drake ...	101,655	Messom and Sons ...	86,815
H. G. Lovatt	99,108	Dorey and Co., Brentford*	82,633
B. E. Nightingale ...	97,573		
Wilcock and Co. ...	93,125		

* Accepted.



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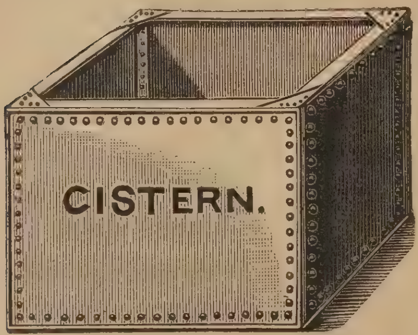

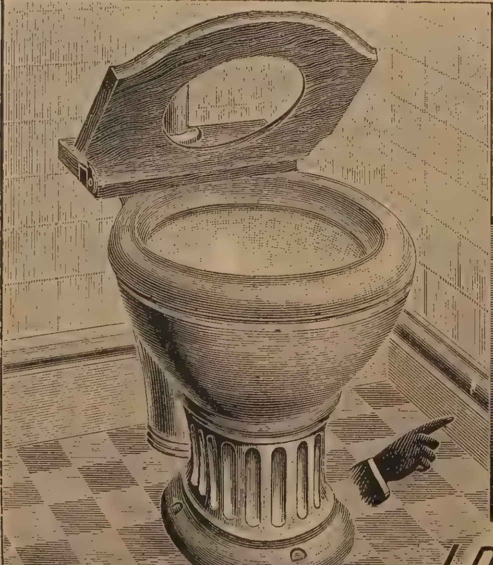

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KING'S LYNN.—For the erection of hospital for infectious diseases and administrative block, Horsley's Chase, for the Town Council. Mr. H. J. Weaver, C.E., Town Hall, King's Lynn:—

W. F Smith	£1,149 0 0	Spragg and Son	£1,076 10 6
C. Allflat	1,123 0 0	Renant Bros., King's Lynn*	1,038 0 0
Bardell Bros.	1,119 0 0		

* Accepted.

LONDON.—For extension of laundry at Alric-avenue, Stonebridge Park, Willesden, N.W., for the White Heather Laundry. Messrs. William Eve and Sons, architects:—

Meach	£3,533 3 4	Hayworth & Son	£3,220 0 0
W. Shurmur	3,420 0 0	G. Wiggs	3,134 0 0
Killby and Gayford	3,310 0 0	Patman and Fotheringham, Limited*	3,091 0 0
Sheffield Bros.	3,242 0 0		

* Accepted.

LONDON.—For rebuilding Nos. 416. 418, and 420, Holloway-road, N., for Messrs. E. Hart and Co. Messrs. William Eve and Sons, architects:—

General Work (exclusive of Ironwork).

Harris and Wardrop	£4,180	Patman and Fotheringham. Ltd.	£3,821
Sheffield Bros.	4,097	Ward and Lamble	3,755
Holliday & Greenwood	3,897	W. Shurmur	3,728
McCornick and Sons	3,889	Chessum and Sons*	3,618
Johnson and Co., Ltd.	3,877		

Constructional Ironwork.

Whitford and Co.	£1,798 0 0	Williams and Co.	£1,492 18 0
Moreland and Son, Ltd.	1,700 0 0	Drew, Bear, Perks, and Co.*	1,429 7 1
Shaw and Co., Ltd.	1,659 0 0		

* Accepted.

LONDON.—For rebuilding the boys', girls', and infants' offices further away from the school building, in order to allow of the provision of halls should they be required; new closet on ground floor for female teachers, and providing new drainage scheme, with the exception of the school-keeper's house, at Shepperton-road School, for the London School Board. Mr. T. J. Bailey, architect:—

Monday and Sons	£2,470	Johnson and Co.	£2,395
L. H. and R. Roberts	2,465	Williams and Son	2,350
Falkner and Sons	2,453	Killingback and Co.	1,964
Lawrance and Sons	2,398	F. Bull*	1,911

* Accepted.

LONDON.—For the erection of Congregational school-chapel at Hither Green. Mr. Louis Jacob, architect, 423, New Cross-road, S.E.:—

		Amount if vestries are omitted.
Simmonds and Son	£3,289	£2,904
J. and C. Bowyer	2,648	2,382
Falkner and Sons	2,769	2,500
Jerrard and Sons	2,624	2,352
T. D. Leng	2,664	2,407
W. Mills	2,999	2,727
Outhwaithe	2,595	2,355
Staines and Son	2,660	2,410
Castle and Son*	2,543	2,283

* Accepted.

LONDON.—For rebuilding the Christian Union Alms houses, John-street, Edgware-road, W., for the Committee. Mr. Eustace Corrie Frere, architect, 29, Lincoln's Inn-fields. Quantities supplied:—

J. Christie	£6,100	F. T. Chinchen	£5,492
Kingerlee and Son	6,054		

LONDON.—For the erection of higher grade mixed school, Cassland-road, four storeys, containing two halls, one on ground floor and one on first floor, each having an area of about 1,700 super ft.; accommodation of class-room calculated on the recognised seat basis. *Ground floor.*—Two class-rooms of 48, one class-room of 40, one class-room of 50; and manual training centre, containing an area of 1,436·6 super ft. *First floor.*—Three class-rooms of 48, three class-rooms 40, one class-room 50. *Second floor.*—Three class-rooms of 48, two class-rooms 56, one class-room 50, gymnasium, area 1,728 super ft., with dressing-rooms and store for gymnasium apparatus. *Third floor.*—Chemical laboratory, area 1,257 super ft., with balance-room physical laboratory, area 662 super ft., with dark-room and stores for chemicals; lecture-room, area 662 super ft.; drawing class-room, area 1,367 super ft.; clay modelling-room, area 551 super ft.; needlework-room, area 547 super ft. Total accommodation, 806. Propulsion system of heating and ventilation; covered playgrounds for boys and girls. Area of playgrounds:—Girls, 10,290 super ft.=26ft. per scholar; boys, 9,610 super ft. =24ft. per scholar. For the London School Board. Mr. T. J. Bailey, architect:—

			†
Scrivener and Co.	£33,634	+	£419
Perry and Co.	33,516	+	421
Chessum and Sons	33,370	+	385
Miskin and Sons	33,340	+	366
Munday and Sons	33,235	+	410
Kirk and Randall	32,806	+	361
Grover and Son	32,749	+	390
T. L. Green	32,585	+	410
J. and M. Patrick	32,149	+	303
Lawrance and Sons	32,022	+	367
Williams and Son	31,971	+	306
L. H. and R. Roberts	31,934	+	299
W. M. Dabbs	31,890	+	288
C. Cox*	31,434	+	291

* Accepted.

† If walls of class-rooms and halls are plastered add.

LONDON.—For the erection of housewifery centres at New Park-road, Smallwood-road, and Swaffield-road Schools. For the London School Board. Mr. T. J. Bailey, architect:—

	New Park-road.	Smallwood-road.	Swaffield-road.
Wall and Co.	£1,410	£1,398	£1,386
Holloway Bros.	—	1,399	1,399
Parsons and Co.	1,391	1,379	1,376
Johnson and Co., Ltd.	1,380	1,314	1,310
Stimpson and Co.	1,355	1,353	1,350
E. Triggs	1,292	1,294	1,281
Martin, Wells, and Co.	1,279	1,295	1,269
Lathey Bros.*	1,263	1,253	1,254

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WINDOW HEADS from 5s. each.
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Estimates Free per Return of Post.
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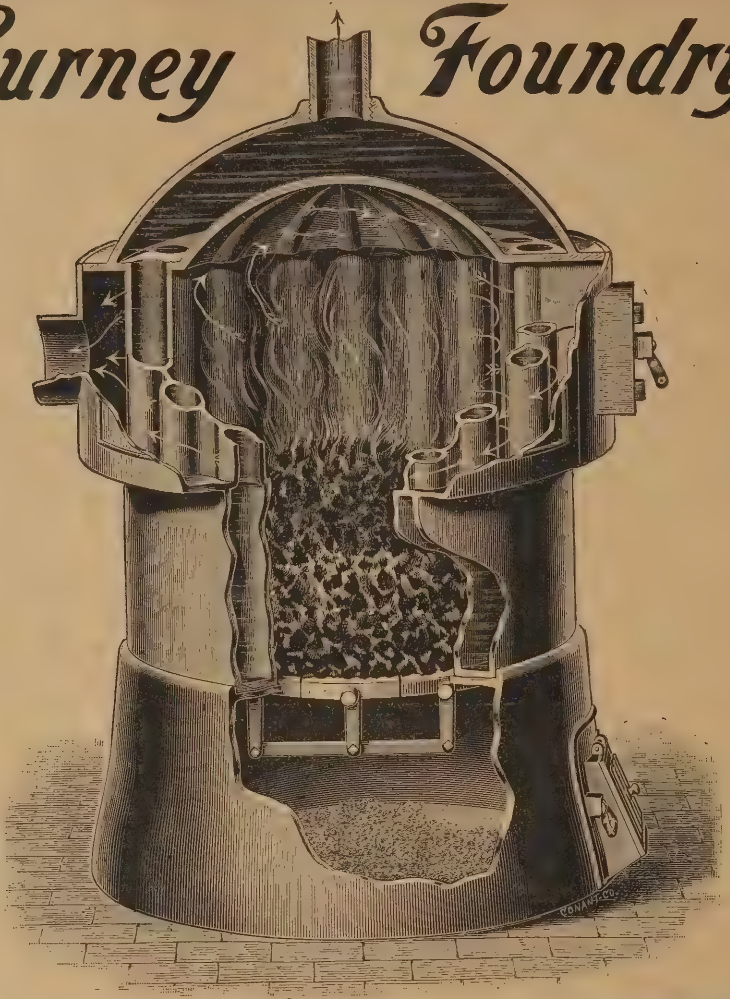

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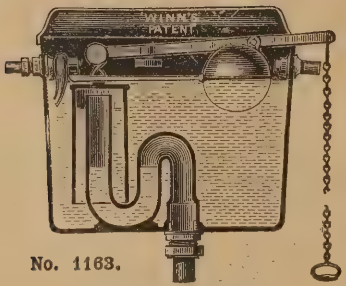

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Bush	£3,858	Whitehead	£3,625
Woodrow	3,780	Courtney	3,567
Lupthorne	3,647		

LONDON.—For improvements at Harper-street School. Providing halls for all departments, with drawing class-room over girls' hall; new staircases for boys and girls; cloak-rooms and lavatories, teachers' rooms, and stock-rooms for all departments; re-arranging, relighting, and restepping existing class-rooms; providing new furnace room and heating apparatus. Revised accommodation: boys, 336; girls, 336; infants, 330; total, 1,002, net loss of 171 places. For the London School Board. Mr. T. J. Bailey, architect:—

Wallis & Sons	£14,395	Lawrance and Sons	£12,573
J. Carmichael	13,423	J. Marsland	12,315
T. L. Green	13,322	W. Smith	12,099
F. and H. F. Higgs	13,255	W. Downs*	11,550

*Accepted.

LONDON.—For improvements at Scarsdale-road school: adapting and enlarging existing class-rooms to form halls for each department; providing two new class-rooms on each floor, one for forty and one for fifty; altering existing entrance steps, boys' and girls'; providing additional outside flight of steps for girls and providing new entrance; forming new communication door in boundary wall and bricking up existing door. For the London School Board. Mr. T. J. Bailey, architect:—

Johnson and Co.	£4,520 10	J. Appleby	£3,683 0
Staines and Son	4,434 0	Bulled and Co.	3,639 0
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Edwards & Medway	3,977 0	J. and C. Bowyer	3,559 0
Smith & Sons, Ltd.	3,694 0	Lathey Bros.	3,555 0

*Accepted.

LONDON.—For the erection of the Tooting Bec Asylum, for the Metropolitan Asylums Board. Messrs. A. and C. Harston, architects, 15, Leadenhall-street, E.C. Quantities by Messrs. Gardiner and Theobald:—

Shillitoe and Son	£251,343	Spencer, Santo, and Co., Ltd.	£210,300
Martin, Wells, & Co.	248,000	J. Carmichael	207,350
C. Wall	225,872	Johnson and Co., Ltd., Wandsworth Common, S.W.*	204,548
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McCormick & Sons	217,222		

*Accepted.

[Architects' revised estimate, £210,000.]

MITCHAM.—For building shops at Mitcham for Messrs. Hoare and Co., Ltd. Messrs. Perry and Reed, architects, 9, John-street, Adelphi, W.C. Quantities supplied:—

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*Accepted.

PRESTATYN (N. Wales).—For the erection of a villa residence for the Rev. W. J. Townsend, D.D., of London. J. H. Burton and J. A. Percival, architects, 150A, Stamford-street, Ashton-under-Lyne:—

Andrew Williams	£1,048 10 0	Henry Wright, Kelsall, Chester*	1,016 2 6
Joseph Williams	1,038 0 0		

*Accepted.

SOUTHAMPTON.—For additions and alterations to Central District Board Schools. Mr. John H. Blizard, architect, Southampton. Quantities by the architect:—

Playfair and Toole	£10,660	H. Stevens and Co.*	£9,826
H. Cawte	9,978	Jenkins and Sons	9,774
F. Walter	9,887	Holl and Son†	8,951
Rashley	9,875		

Architect's estimate, £10,000.

[All of Southampton.]

* Accepted. † Withdrawn.

WIMBLEDON.—For the erection of ten workmen's dwellings, Dunsford-road, for the Urban District Council. Mr. C. H. Cooper, C.E., Broadway, Wimbledon:—

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T. G. Sharpington	3,680	Milledge and Son, Wimbledon*	2,615
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C. P. Tilbury	2,730		

* Accepted.

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Do. Tobasco	do.	0 0 4 13/16	—
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks	do.	7 10 0	17 10 0
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Rugby,
October 26th, 1899. 2

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Sealed Tenders, endorsed "Outfall Sewer," to be sent to Mr. T. M. WRATISLAW, Clerk to the Council, on or before NOVEMBER 18th next.

The Council do not bind themselves to accept the lowest or any Tender.

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Assoc. M. Inst. C. E., Engineer and Surveyor.
Rugby, October 26th, 1899. 2

WALTHAMSTOW SCHOOL BOARD.

TO BUILDERS AND CONTRACTORS.

The Walthamstow School Board invite TENDERS for the ERECTION of NEW SCHOOL BUILDINGS in Blackhorse-road Walthamstow.

The drawings and specification may be seen, and bills of quantities obtained, at the office of the Architect, Mr. W. A. LONGMORE, F.R.I.B.A., No. 7, Great Alie-street, London, E., between the hours of TEN a.m. and FOUR p.m. (except on Saturdays).

A £5 note must be deposited for the quantities, and another £5 note must be inclosed with the Tender, both of which will be returned to those sending in bonâ-fide Tenders.

Tenders to be endorsed "Tender for New Schools," and to be addressed to the Clerk of the School Board, Clevelands, High-street, Walthamstow, and delivered not later than SEVEN o'clock on TUESDAY, NOVVEMBER 7th, on which day they will be opened at EIGHT p.m.

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T. W. LIDDIARD,
Clerk to the Board.
School Board Offices,
High-street, Walthamstow,
October 18th, 1899.

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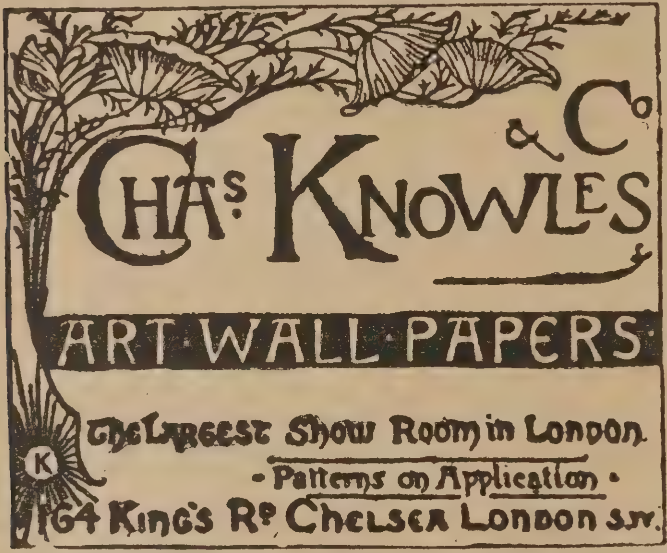
W. MULLARD,
Clerk of the Council.
Council Offices, Lymm,
October 20th, 1899.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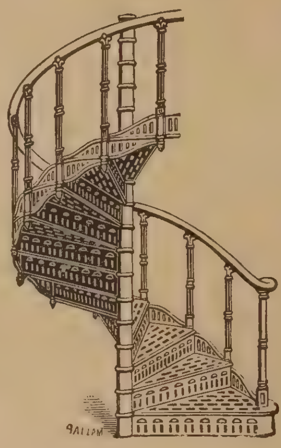

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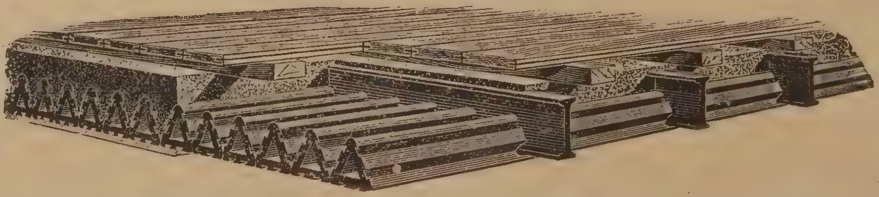

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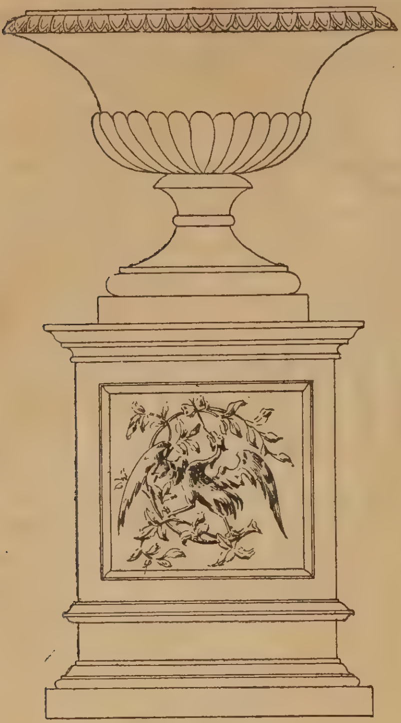


FIG. 1. DESIGN FOR GARDEN VASE.

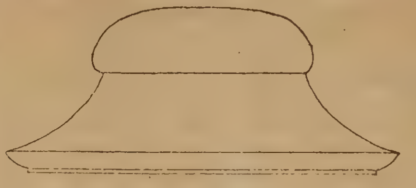


FIG. 2. BODY OF VASE WITHOUT ORNAMENT.

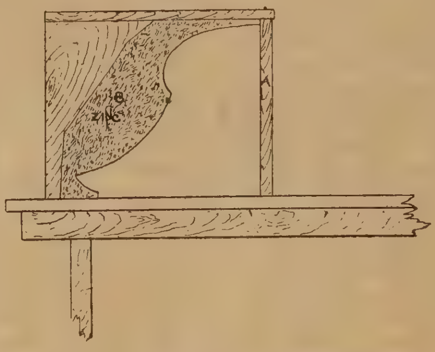


FIG. 3. APPARATUS FOR CONSTRUCTING BODY OF VASE.

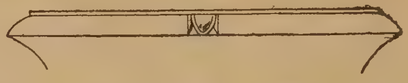


FIG. 4. SINGLE REPEAT OF DESIGN ON RIM.

A TERRA-COTTA GARDEN VASE.

By WILLIAM REID.

THE garden vase shown at Fig. 1, though perhaps of as common a pattern as any, will serve as a model to show how such an article is manufactured in terra-cotta. As has been said in former articles, the first process is to make a model of the object—usually in plaster-of-Paris. If the vase were stripped of all its ornamentation its appearance would be as shown at Fig. 2, and this is the shape that has to be turned in plaster. In this figure the body of the vase only is shown, the neck being made separately. In a previous article in THE BUILDERS' JOURNAL (No. CCXVIII.) an illustration was given showing a sort of lathe on which round balusters were turned in plaster. A similar lathe might be used for turning a vase if this is not too big; if, however, the vase is large and bulky, it is usual to fit up an arrangement like that shown at Fig. 3. It will be seen that if plaster is built up and around the upright support A, and the template B is swung round, a shape similiar to Fig. 2 will be produced. In turning out a piece of work like this it is not, however, necessary that it should be of plaster throughout. This, to some extent, would be wasteful, and it is therefore usual to wrap old sacks or straw round the central upright and to fill up with any odd pieces of plaster, simply binding this packing together with a few handfuls of newly-gauged plaster. It is only when this core approaches the zinc template that fresh plaster need be used. The ornament is next modelled on the body. In the case of the egg and dart moulding round the rim of the vase, it is only necessary to model one unit or repeat, as at Fig. 4. A mould is made and clay pressings taken and adjusted to the rim, remembering that before these pressings can be made to adhere to the plaster it is necessary to varnish the model. This was explained in the article on a design for a gable tympanum, in No. CCXXVIII. The neck is turned in a lathe in the same way as a baluster. The pedestal is made by joining together four slabs of plaster, in the manner illustrated at Fig. 5, and adding the mouldings to the top and bottom afterwards. The plaster slabs are held together by filling up the corners with newly-gauged plaster, but it will be found necessary to thoroughly wet the corners before this is done, otherwise the moisture in the plaster will be absorbed by the dry slabs, and not only will proper setting be prevented, but the adhesive strength will be impaired. The neck is moulded in exactly the same way as a baluster, and the pedestal like the moulding (see Nos. CCXV. and CCXVI). The moulding of the vase itself requires somewhat different treatment. The rim is the first part moulded. It is necessary to sink an iron wire or rod into this part of the mould to prevent the chance of breakage. The rod is first bent into a hoop slightly larger than the rim, and is dropped into the newly-applied plaster before it has quite set. Then the vase is turned over so as to rest on its rim, as shown at Fig. 6. The remaining moulding must be done in several pieces, the number of which will depend on the size and design of the vase. In the present instance four or six pieces will suffice. Set out two walls of clay about 12in. high (Fig. 6) and fill up the enclosed space with plaster. This piece is trimmed up, as shown at Fig. 7, and another wall of clay built up as indicated by the dark line on the drawing. This piece is treated as in the previous case, and similar pieces are added until the whole presents an appearance like Fig. 8. The mould is completed by adding the case, as at Fig. 9.

It is scarcely necessary to add more, as if reference is made to the back numbers of this journal sufficient details will be found as to how the moulds are filled with clay, and how the clay pressing is further treated before being set in the kiln.

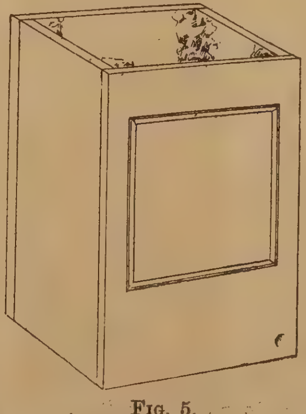


FIG. 5.

FIG. 5. METHOD OF CONSTRUCTING PEDESTAL.

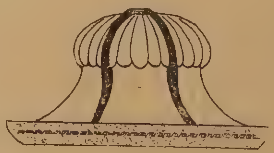


FIG. 6.

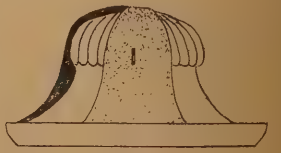


FIG. 7.

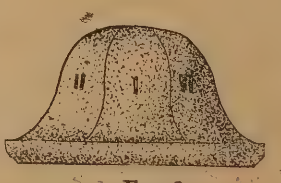


FIG. 8.

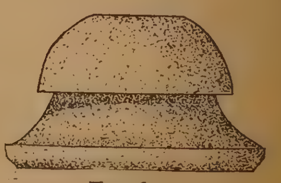


FIG. 9.

FIGS. 6, 7, 8, 9. DIFFERENT STAGES IN MOULDING BODY OF VASE.

Surveying and Sanitary Notes.

London Main Drainage.—A conference of representatives of the leading parishes north of the Thames was held on Friday at the Paddington Vestry Hall, when a resolution was carried urging the L.C.C. to improve the main drainage system north of the river. (See page lxi. of the supplement to No. CCXLII.)

A New Method of Making Artificial Stone. — Artificial paving stones are now made by mixing coal tar with sulphur, adding chlorate of lime to the resulting semi-liquid mass. After cooling, the mass is broken into small pieces, and mixed with glass or blast furnace glass slag, the powder being then subjected to a pressure of 200 atmospheres and reduced to the form desired. The advantages claimed are: Durability equal to that of many stone roads, resistance to changes of temperature, a roughness of surface which gives horses a good foothold, a non-transmission of sound, and, as the joinings are very small, dirt is avoided and cleaning is very easy.

Oldham Corporation Fined for Making a Nuisance.—At the Chadderton Police Court recently the Oldham Corporation were summoned under Section 114 of the Public Health Act at the instance of the Manchester Corporation for causing a nuisance at their works at Bower Clough, Hollinwood.—Mr. Rhodes, in opening the case for the prosecution, described the processes carried on at the works. The nightsoil was carted from the town and placed in tanks, and mixed with cotton shoddy, which absorbed the moisture and was used as manure. These processes caused a nuisance in the neighbourhood, and also constituted a danger to the health of the residents in the vicinity. Dr. Niven, medical officer for the City of Manchester, said that the smell caused was not only nauseous and offensive, but actually dangerous to health, as likely to carry bacteria. A number of sanitary inspectors in the employment of the Manchester Corporation and residents in the district gave evidence of the existence of the nuisance.—Mr. Hallsworth, for the defence, denied the existence of the nuisance. The works could not be carried on without creating a smell, but that smell was not such as to cause injury or discomfort to the residents round about. In the present circumstances of Oldham they could not do without such a depot, but they were doing all they could to get the people to adopt the water-carriage system, and the Corporation intended to promote a Bill in Parliament, one of the clauses of which would do much to remedy the evils complained of at the depot.—A number of residents near the works gave evidence to the effect that there was no nuisance.—The magistrates said they were satisfied that there was a nuisance, and that it had not been shown that the defendants had used the best means to abate it.—A fine of 40s. and costs was imposed.

Masters and Men.

Compensation to a Brickworks Employee.—Judge Raikes, Q.C., sitting in his private room at the County Court, Barnsley, had before him an action under the Workmen's Compensation Act in which James Tompkins (14), oiler at a brick-pressing machine, son of John Tompkins, carter, of 23, Cherrytree Street, Elsecar, sued James Smith and Co., brick manufacturers, of Skiers Spring Brickworks, Hoyland, to recover damages for injuries sustained at his work. After hearing the evidence, his Honour was of opinion that if the lad had not positive orders he had consent to what he was doing when the accident happened, and he therefore allowed £1 5s. 8d. as half-wages for eight weeks, and £2 for permanent injury, with costs.

Engineers and Parliamentary Representation.—Members of the Amalgamated Society of Engineers are determined upon obtaining direct representation in the next Parliament, and arrangements toward this end are being steadily pushed forward. A levy of 3d. per member has been agreed to, and the income resulting will amount to £300 a year. The feeling at present seems to be in favour of contesting three constituencies, and, if this should be the decision of the general body of A. S. E. members, Gorton, Newcastle, and Sunderland are considered the likeliest places for the purpose, owing to the large proportion of engineers in the population of these districts. This, however, is a matter for the consideration of the society, and the rank and file will also have an opportunity of deciding the question of who shall be the candidates for Parliamentary honours.

The Leeds Building Dispute.—Little has of late been heard of the differences between the masters and men engaged in the Leeds building trade. After a period of quiescence the parties have been engaged in an interchange of views, and, in the case of the Manchester Society of Bricklayers, with tangible results. For about five months the members of this association have been working on perfectly amicable terms with the employers, but without rules. Within the last few days, however, they have, at a conference with the masters, agreed to and signed a code of regulations which shall henceforth govern the industry so far as they are concerned. This code embodies the 1896 rules *en bloc*, with the important addition of a proviso under which future disputes are to be discussed by a standing joint committee before either party proceeds to extreme measures. Masters and operatives will, of course, be equally represented on the Conciliation Committee. It may be remembered that the 1896 rules referred to were the outcome of the protracted strike in the summer of that year. The London Order still maintain the strike, which they entered upon shortly after the lock-out on May 6th, but as a matter of fact the duties of the Strike Committee have for some time been reduced to a minimum, practically the whole of the members having obtained employment away from Leeds, or with non-federated masters at home. Informal negotiations have now been opened with the view of bringing the members of this order and the employers together. Already representatives of the two parties have met, and a definite decision, either one way or the other, may shortly be expected. It will be remembered that, apart from the lock-out of May, the London Order had demanded an increase of a penny per hour.

Ladders and Scaffolding: Another Case.—A painter named James McDonald recently sued Messrs. Hobbs and Samuel, house painters, for compensation under the Workmen's Compensation Act, and the case came before the Scottish Court of Session on October 17th. It appears that whilst McDonald was painting some joists in the Dead Meat Market, Glasgow, the ladder on which he was standing (which was provided by the defendants) was violently knocked by the carcase of a bullock swung by the stall occupier, and he fell to the ground, fracturing his skull. The Sheriff-Substitute had decided that as the building was not being repaired by means of a scaffolding within the meaning of the Act, the accident was not one cognisable under the Act, and dismissed the application. The question of law for the opinion of the Court was whether the ladder used by the appellant at the time of the accident was "a scaffolding" within the meaning of the Act. The Court (Lord Young differing) decided the question in the negative, and found the defendants entitled to expenses.—The Lord Justice-Clerk said it had been already decided by a Court in England that a ladder when used as a ladder was not a scaffolding. If the Legislation had meant a ladder to be equivalent to a scaffolding in the sense of the Act they would have said so.—Lord Young said he was quite of opinion that painting a beam was not "repairing;" whether a scaffolding or a ladder was used in the painting, the case was not one that came within the meaning of the Act. They were told at the Bar that the building was in course of being repaired by means of a scaffolding, and if that was so it was idle to decide that a ladder could not possibly be a scaffold although used for the purpose of erecting a building or repairing it. He thought the case should go back to the Sheriff-Substitute for inquiry upon the point. He should just like to add that if that ladder had been used for the purpose of building or repairing he should not have been disposed to hold that because it did not answer the meaning of a scaffold the case would not come under the statute. Lords Trayner and Moncreiff agreed with the Lord Justice-Clerk.

What is a Scaffold?—His Honour Judge Whitehorne delivered judgment at Birmingham last week in the case of Sutton v. Whitehouse, which was an application made under the Workmen's Compensation Act by Thomas Sutton, a bricklayer, 121, Great Tindal Street, Ladywood, for 16s. 8d. per week from his employers, B. Whitehouse and Sons, builders and contractors, 110, Monument Road, Birmingham. The evidence showed that in June last the applicant fell from a ladder whilst repairing the roof of a house and received such injuries that he was incapacitated for work. The defence raised was that the applicant was working on a ladder and not on a scaffold; therefore the Act did not apply. One witness said that the two ladders used were roped together, and a footboard which was on the roof was fastened to the top ladder, the whole being secured to the wall of the building by a hook, thus constituting a temporary structure which would come within the meaning of the Act. A witness called for the defence denied that the ladders were secured in any way. In delivering judgment his Honour pointed out that the question was raised as to what was really meant by a scaffolding under the Workmen's Compensation Act. The seventh section of the Act applied only "to employment on, in, or about any building which exceeds 30ft. in height, and which is either being constructed or repaired by means of scaffolding." It was admitted in this case that the building was more than 30ft. in height, and there was no question about it being repaired. The only question was whether the building was being repaired by means of a scaffolding. The employment of scaffolding was, according to the Act, a condition precedent to the obtaining of any relief under the Act in respect of an accident that had happened in the course of repairing a house above 30ft. in height. He had, in the case of Williams v. Upton, decided on January 17th last, stated in that judgment that "it was clear that a scaffolding must be a construction, an edifice consisting of several items furnishing a platform on which a man or men might stand. Whether the erection was of greater or less complexity, and of greater or less size and permanence, seemed to him to be immaterial. Once given a construction for such a purpose, and of such a character, it was a scaffolding under the Act." To that definition he entirely adhered. His Honour could not say that in this case there was an edifice, a construction in the nature of a platform upon which the man was standing when the accident happened, and therefore he must decide the case directly within the dictum of the learned President of the Court of Appeal—that no man in his senses could say that a ladder was a scaffolding. Consequently he must decide against the workman and in favour of the employer.

Engineering Notes.

A Marine Lake at West Kirby, Birkenhead, 1,100yds. long and 150yds. wide, has just been completed.

For Electric Lighting Improvements at Leicester, application is to be made to the Local Government Board for sanction to borrow £100,000.

Singular Accident at Leeds.—Two men were recently excavating around a gas lamp off West Street, Leeds, when they were suddenly overcome by an escape of gas and rendered unconscious.

A Twenty-Five Years Want Supplied.—For the last quarter of a century the inhabitants of Ledbury have been waiting for a supply of water. It has now arrived—from the new pumping station at Massington. The water is pumped from the well into a large reservoir at The Cross Hands, one mile from the town.

The Small Heath Bridge, Birmingham.—At the meeting of the Birmingham City Council on October 24th the recommendation of the Public Works Committee was adopted to build a bridge across the Great Western Railway, so as to connect Small Heath and Sparkbrook. The bridge will be 316 yards long, will have five piers, and is estimated to cost £49,000. At the same meeting it was decided to erect additional stabling, &c., at Lancaster Street Wharf, at an estimated cost of £2,000; to carry out sewage and surface-water drainage works at Highfield Road, Saltley Viaduct, Windsor Street, and Anthony Road, at a cost of £1,660; and to continue College Street, Spring Hill, to Roseberry Street, at an estimated cost of £912.

Destroying Bridges by Electricity.—A novel means of destroying a wooden bridge by electricity has recently been successfully used by American engineers. The bridge consisted of three spans with a 70ft. draw over a navigable stream, the total length of the bridge being 735ft. Each span was composed of nine chords of three timbers each, and by cutting these twenty-seven sills simultaneously the spans dropped into the river between the piers. This cutting was done by burning through the wood by loops of iron wire made redhot by an electric current. Weights were fastened to the bottom of each loop to pull it down as it burned through the timber. An alternating current at fifty volts was used. One span was wrecked at a time, one hour forty minutes being required in each case from the turning on of current until the fall of the span.

A Big Tramway Scheme.—A huge scheme of electric tramways for the northern part of Surrey, that will be submitted to the London County Council on November 14th, includes lines connecting Hammersmith Bridge with Barnes, Mortlake, and Richmond, one from the London county boundary at Wimbledon Common, passing over Kingston Hill to Kingston; others connecting Tooting Junction with Mitcham, Carshalton, and Sutton, approaching Croydon urban boundaries at several places, and an extension from these by two routes to Raynes Park, through Wimbledon and through Merton. From Raynes Park it will pass across country to New Malden, thence onward to Kingston, where it will throw a branch northward towards Richmond, as far as Ham Common, and so from Kingston through Surbiton, with several subsidiary routes to Ditton.

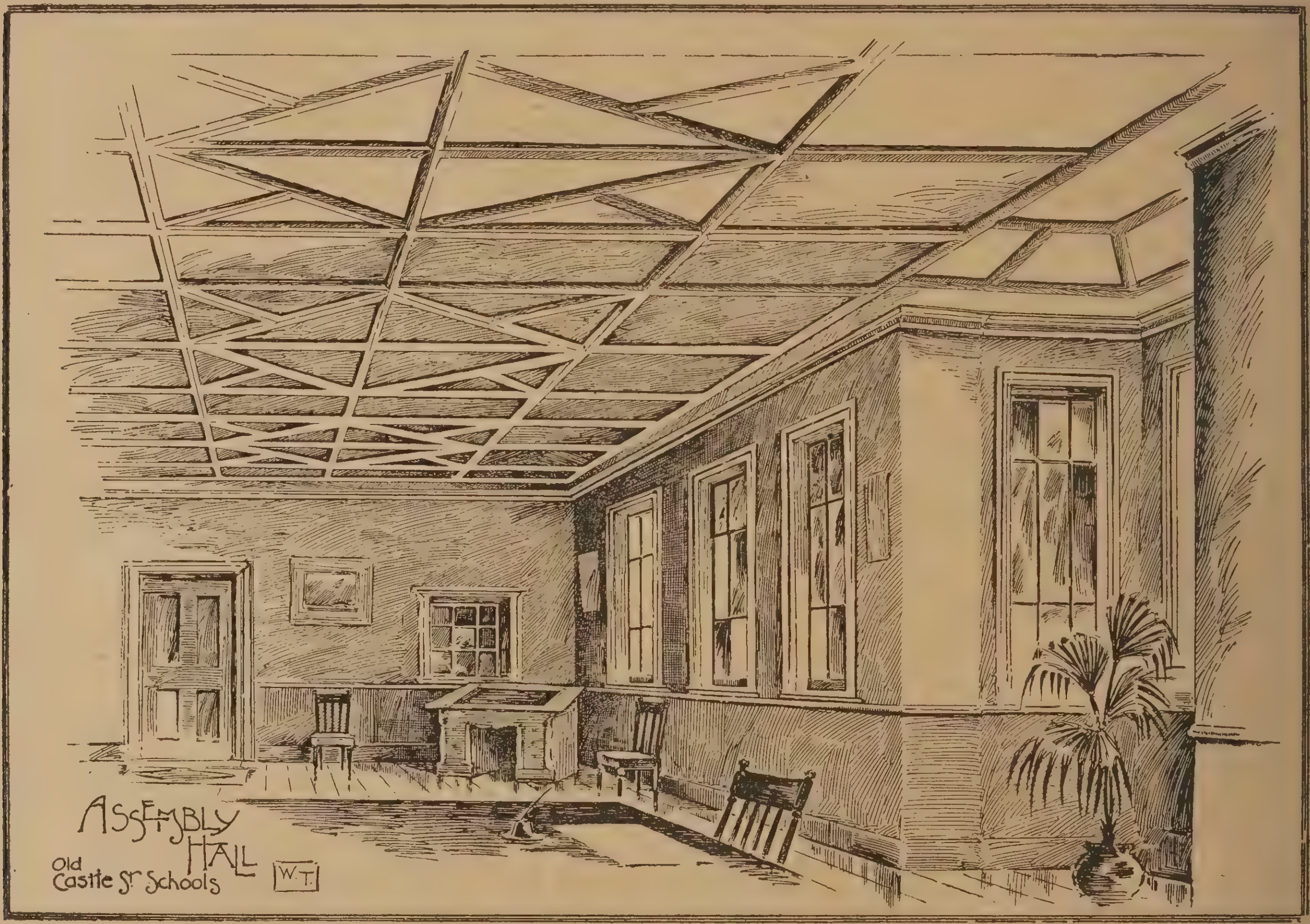
Trade and Craft.

COMPO-BOARD.

Since the last great trouble with the plasterers architects and builders are more desirous than ever of finding an efficient substitute for plaster, not only as regards effectiveness but also as regards price. Among the many various things that have been put on the market perhaps nothing has fulfilled the various claims so well as compo-board. The British Compo-Board Company, who hold the concession for the patent rights of sale for this country, did not begin to tackle the trade until they had a large quantity of material in stock at their mills, in order that they might be able to cope with the expected sale. Compo-board was practically introduced into this country at the Building Trades' Exhibition held at the Agricultural Hall last April, and already more than one million feet have been disposed of. Compo-board consists of a number of wooden slats, 4ft. long and 1in. wide, joined together by compressed damp-proof pulp boards on each side. These are set under hydraulic pressure, and when they are thoroughly dry, and have been chemically treated to make them damp-proof, a strong, stiff board is obtained, 4ft. wide and of any length up to 18ft. Our readers will immediately see the immense advantage a board of this description has over match-boarding, lath and plaster, fibrous plaster slabs, and similar articles for ceilings and walls. It is nailed to joists and studs, and is, in fact, entirely the work of carpenters and joiners. It can be immediately papered, distempered, or painted, and wherever speed is necessary, or where, as in alterations and repairs, the client desires to carry on his ordinary business at the same time, there is no material that will more effectively put the builder in a position to comply with the demands of the situation. The price of compo-board comes out at about 1s. 6d. per square yard without fixing, but the latter charge must necessarily be very small as the board comes to hand in such big sizes.

The material has already been extensively adopted by many large corporations, such as the London School Board and various provincial school boards, railway companies, H.M. Office of Works, Royal Arsenal (Woolwich), and by most of the large builders in London and the provinces. The accompanying illustration shows one of the rooms in the board school at Old Castle Street, Whitechapel, E. The ceiling has been laid out in easy panels, and for this kind of work especially there is no material that seems to be so handy and economical as compo-board. All the big schools built since the Spring by the London School Board have most of the ceilings made with this material, a fact that bears some weight with it. Of course, the majority of all these ceilings have simply a plain straightforward surface. The boards are joined on the end-grain edge of the wood, and it is very easy to stop such joints and make them smooth and level.

The offices of the company are specially built to show the use of compo-board as applied to partition walls and plain ceilings, as well as in simple and complex panels, dado work, &c. As a first class non-conductor of sound it is freely used by the National Telephone Company for their silence rooms and telephone boxes, and also by many of the City property companies as an ideal substance for office purposes. It is also a perfect non-conductor of temperature, and as such, is probably the very best material available for lining wooden houses or iron buildings, in order to keep these warm in winter and cool in summer. For all kinds of exhibition work, obelisks, show-cards, &c., its large clear surface will recommend it, and considerable quantities have been used and may be seen at the Earl's Court Exhibition, especially in the Transvaal section, where the large columns indicating the annual output of gold are built entirely of compo-board. Go-ahead architects and builders will no doubt be glad to see such an article in the market, especially now, when large panels are so much in demand.



ASSEMBLY HALL IN BOARD SCHOOLS, OLD CASTLE STREET, WHITECHAPEL, E.

MESSRS. TALBOT AND CO., LEEDS.

Messrs. Talbot and Co., glass stainers and merchants, of Leeds Bridge, have for some time felt the inconvenience arising from premises inadequate for their growing business; but steps have now been taken which at once remedy matters. The premises in the main thoroughfare at Leeds Bridge are retained, so far as the front is concerned, as a show-room, &c.; but fresh accommodation has been found in a street close by which possesses the additional feature of wharfage. There is also plenty of ground upon which fresh buildings may be erected when necessary. The premises have been fitted up and adapted so as to provide in a most complete manner for every department of the business. On the ground floor there is a warehouse room for the storage of a large quantity of glass, and on the same floor is the embossing department, where ordinary, French, and shaded glass is worked. There are also special facilities for loading under cover, with proper crane accommodation, &c. The patent gas glass-bending kilns are, however, the chief feature. These are thoroughly up-to-date, and enable plates to be bent at very short notice. The kilns are used for staining as well as for bending. The buildings include art studios, where the designs are produced, and where, at the time of the recent visit of our representative, there were windows in hand for several well-known churches in various parts of the country. Wrought iron and gun-metal casements are made on the premises. Messrs. Talbot are certainly to be congratulated upon having made such ample provision for the execution of their ever-increasing business.

VENTILATING AND HEATING.

It is a sign of the times that manufacturers and dealers are now beginning to wake up from their prosy state of conventionality, and to make their catalogues a little more interesting than hitherto. There is certainly nothing to be lost in supplementing the illustrations of goods with a readable description of them, and it is therefore with pleasure that we have to refer to the catalogue of Mr. R. W. Boyd, of 105, New Bond Street, London, W. It is a good recommendation to state that this business has been in existence for 100 years. The information in the catalogue is given under the title, "Suggestions as to Ventilating and Warming as Applied to Churches, Schools, Hospitals, Prisons, and Private Houses," and is very clearly set forth. "Common-Sense" wall and roof ventilators are shown, and directly following is a very interesting outline history of artificial warming. The "indirect" method of warming buildings, which consists in developing the heat at one point and distributing it away from the source of power, was adopted by the Romans more than a thousand years ago. It may now be generally classified under seven heads:—Hot water (low pressure); hot water (with a downward circulation); hot air; hot air and hot water combined; hot water (high pressure); steam; and electricity. All these are described and illustrated in the catalogue, which should thus be found very useful. A few of the illustrations are coloured with red and blue, indicating respectively warm and cold air. All kinds of radiators are shown, some of which are very attractive in appearance. Among the boilers there is an independent cylindrical boiler surrounded by its own flues that uses the furnace heat both inside and outside the water-jacket. Great economy of heat is thus effected. As we have already said, the book is well got up and the matter pleasingly dealt with, merits which it is certainly desirable that more catalogues should possess.

For stealing a bricklayer's tools, valued in all at 14s. 10d., a labourer named Mills was recently fined 20s. at Norwich.

Expansion of Girders under Fire.—In connection with the recent big fire at Messrs. Avery's Birmingham premises it has been stated that very soon after the outbreak the iron girders expanded and twisted, and forced out the walls of the building.

Breach of Building By-laws.—At the Ossett Borough Court last week, Messrs. Mitchell and Co., woollen manufacturers, of Ossett, and Mr. G. W. Oldroyd, builder and contractor, were fined 5s. and 20s. respectively, with costs, for a breach of the building by-laws in failing to give notice and to submit plans of a new storey added to a building.

Builders' Notes.

A Year's Building in Leeds.—During the twelve months ending October 13th, 2,607 sets of plans have been dealt with by the Building Plans Committee of the Leeds Corporation, as compared with about 2,000 for the previous year.

The Building Trade in Douglas, Isle of Man, promises to be brisk during the coming winter. The enlargement of the Grand Theatre will, it is stated, shortly be commenced, and the conversion of the pavilion into a theatre is already in progress. It is more than probable that Falcon Cliff Hotel will be converted into a first-class hydro, with the addition of over 100 bed, recreation, and other rooms. Building on the Falcon Cliff estate is now going on, and there is considerable likelihood of a woollen cloth manufactory, and perhaps a paper mill, being erected on the Belle Vue estate, near Douglas.

London County Council.—At the meeting of the Council on October 24th it was decided to clear away the slums in St. Luke's, Holborn, Clerkenwell, Southwark, and Poplar. The cost will be more than half a million. In bringing up the report, Sir J. Dickson-Poynder, M.P., chairman of the Housing Committee, said that since March 31st five large buildings had been completed in different parts of London, that another five would be ready for occupation within the next two or three months, and that twelve other blocks were now in the hands of the contractors and the Works Department, and would be finished in about a year and a half. The great Westminster improvement scheme, particulars of which are given in another column, was adopted. Reports were presented with reference to two historic houses—No. 17, Fleet Street, known as "Wolsey's Palace," and "Rutty's House," Bromley. The report dealing with the former, in which the opinion was expressed that the Council would not be justified in buying it, was withdrawn. A good deal of discussion took place with regard to "Rutty's House," and it was eventually decided to refer the matter back. The Theatres and Music Halls Committee required some alterations (which were agreed to) with regard to a new hall to the Great Eastern Hotel, Liverpool Street. This will have a frontage of 120ft. to Bishopsgate Street, and 160ft. to the drive to Liverpool Street Station, and will accommodate 700 persons.

Contractor v. Sub-contractor.—At the Nottingham County Court last week, before his Honour Judge Masterman, J.P., D.C.L., a case was decided in which Mary Ann Brady, the widow of James Arthur Brady, sued for compensation for the death of the deceased, who was accidently killed on June 29th while at work on a building in course of construction for Messrs. Barker, furniture dealers, of Angel Row. A hoist which was being used on the building for the purpose of taking up slates had on it a receptacle for holding the slates, and by some means or other this fell on Brady and killed him. The main facts of the case were not disputed, but the question to be decided was as to who was liable for the compensation, Messrs. Cooper and Crane, the builders, or Mr. A. Wright, of Greyfriar Gate, the sub-contractor for the slating. Messrs. Cooper and Crane had taken the contract to erect this building, but the deceased was employed and paid by the slater. Messrs. Cooper and Crane contended that the deceased was not employed by them in any part of their business, and that Mr. Wright was not a sub-contractor for any part of their regular work, but for work which was incidental; while on the other hand, Mr. Wright contended that he was not the undertaker of any work to which the Workmen's Compensation Act applied. It was contended for the plaintiff that it could not have been the intention of the Legislature that a contractor should be allowed to sub-let an integral portion of a building to a man who, in some cases, might not be worth twopence, and that then, if a workman was injured, he should only be able to claim against the sub-contractor. What the Court had to decide in this instance, however, was whether slating or tiling constituted an ordinary part of the trade of a builder or contractor; if it was held not to do so it would rob men of compensation.—His Honour was of opinion that in this case the work of slating was a part of the trade or business carried on by the contractor, and he felt confident that Messrs. Cooper and Crane were liable. He therefore found for the applicant for the amount claimed, as against Messrs. Cooper and Crane, viz., £217 8s. 6d., being the deceased's wages for three years at the rate of £1 7s. 10½d. per week.—On the question of indemnity by the sub-contractor the judge reserved his award.

Electric Light at the Stoke-on-Trent Workhouse.—It has been decided to make application to the Local Government Board for power to borrow £6,550 for laying down electric lighting plant at the workhouse.

The Institution of Mechanical Engineers held a general meeting on Friday last, when a paper was read on "The Incrustation of Pipes at the Torquay Waterworks," by Mr. William Ingham, engineer for that borough. Sir William H. White, the president, was in the chair.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		BUILDING—		
Nov.	3	Dewsbury—Branch Store and House	Pioneers Industrial Society, Ltd.	Holton and Fox, Architects, Westgate, Dewsbury.
„	3	Hessle, Hull—Committee Room at Cottage Homes	Sculcoates Union Guardians	T. B. Atkinson. 11, Trinity House-lane, Hull.
„	3	Nottingham—Fitting Shop, Tank House, &c.	Midland Railway	Company's Architect, Cavendish House, Derby.
„	3	Padstow, Cornwall—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.
„	3	Banff, N.B.—Coastguard Buildings	Admiralty	Director of Works Dept., 21, Northumberland-avenue, W.C.
„	4	Sheffield—Fireclay Goods (Retort Bricks, &c.)	United Gaslight Company...	J. W. Morrison, Co.'s Engineer, Commercial-st., Sheffield.
„	4	Rushall, near Walsall—Alterations, &c., to School	School Board	Hickton and Farmer, Architects, Bridge-street, Walsall.
„	4	Bicester—Floors in School	National Schools Governors	C. W. Brabant, Hon. Sec., South View, Bicester.
„	4	Cork—Repairs to Labourers' Cottages	District Council	J. Cotter, Clerk to Council, Board Room, Workhouse, Cork.
„	4	Edinburgh—Underground Convenience	Magistrates and Council	Burgh Engineer, City Chambers, Edinburgh.
„	4	Hesket, near Carlisle—Alterations, &c., to School	....	Rev. J. A. Scott, Vicarage, Hesket.
„	6	Dundrum, Co. Dublin—Laundry Buildings, &c...	Central Criminal Lunatic Asylum	Office of Public Works, Dublin.
„	6	Oldham—Public Baths	Markets and Baths Committee	S. A. Pickering, Borough Surveyor, Town Hall, Oldham.
„	6	Walsall—Urinal	Corporation	Borough Surveyor, Bridge-street, Walsall.
„	6	Bermondsey, S.E.—Painting and Decorating Town Hall	Vestry	Surveyor, Town Hall, Bermondsey, S.E.
„	7	Douglas, Isle of Man—Enlarging Post Office	Commissioners of H.M. Works	J. Flew, 11, Popplewell-chambers, Market-street, Bradford.
„	7	Walthamstow—School Buildings	School Board	W. A. Longmore, Bridge-chambers, Hoe-st., Walthamstow.
„	7	Enfield—Girls' Department and Assembly Hall	School Board	G. E. T. Laurence, 181, Queen Victoria-street, E.C.
„	7	London, W.—Female Staff Home, &c., at Infirmary	St. George's Union Guardians	E. T. Hall, 57, Moorgate-street, E.C.
„	7	Amesbury, Wilts.—Wesleyan Chapel, &c.	....	Moody and Sons, Fisherton-street, Salisbury.
„	7	Cardiff—Rebuilding Premises...	....	E. M. B. Vaughan, Architect, Cardiff.
„	7	Erdington, near Birmingham—Shed, &c.	Aston Union Guardians	C. Whitwell, 23, Temple-row, Birmingham.
„	7	Truro—Alterations to Operating Theatre...	Royal Cornwall Infirmary...	C. Cole, 50, High-street, Exeter.
„	8	Cymmer, Wales—Seven Houses	....	A. O. Evans, Architect, Pontypridd.
„	8	Llandovery—School and House Wings to College	....	Wright and Son, Surveyors, Lancaster.
„	8	Waunllwyd, Wales—Forty Houses	....	Swallwell and Creighton, Architects, Steam Packet-chambers, Dock-street, Newport, Mon.
„	8	Oundle—Infirmary, Vagrants' Ward, &c.	Union Guardians	Gotch and Saunders, Architects, Bank-chambers, Kettering.
	8	Victoria, Mon.—Forty Houses	J. Light	Shalwell and Creighton, Architects, Steam Packet-chmbrs., Dock-street, Newport, Mon.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Nov. 9	Hastings—Laying Fireproof Floor to Workhouse	Guardians	Jeffery and Skiller, 5, Havelock-road, Hastings.
,, 13	Beckenham—Two Foremen's Cottages, &c.	Urban District Council	J. A. Angell, Surveyor, Council's Offices, Beckenham.
,, 13	Leicester—Wholesale Market	Corporation	W. Brand, 16, Bishop-street, Leicester.
,, 13	Westbury-on-Severn—Tramp Wards, &c.	Union Guardians	W. F. Jones, 21, George-street, Gloucester.
,, 14	Woolwich—Public Library	Local Board of Health	Church, Quick & Whinsop, Architects, William-st., Woolwich.
,, 14	Exeter—Offices	Great Western Railway Company	Engineer, Great Western Rly. Station, Plymouth.
,, 14	Bath—Forty Dwellings	Urban Sanitary Authority	City Surveyor, Guildhall, Bath.
,, 14	Sandown, I. of W.—Higher Grade School	Brading School Board	J. Newman, Architect, "Thornton," Sandown.
,, 14	Battersea, S.W.—Two Dwellings	London County Council	Engineer's Department, County Hall, Spring-gardens, S.W.
,, 14	Westminster—Retaining Walls and Foundations for New Public Offices	Commissioners of H.M. Works and Public Buildings	Sir J. Taylor, H.M. Office of Works, Storey's-gate, S.W.
,, 15	Rhyl, Wales—School Buildings	Governors of Intermediate Schools	F. H. Shaylor, Architect, Belvoir House, Shrewsbury.
,, 20	Southampton—Workhouse Infirmary	Guardians	W. H. Mitchell, Son and Gutteridge, 9, Portland-street Southampton.
,, 22	Cricklade, Wilts.—Police Station	Standing Joint Committee	C. S. Adye, County Surveyor, County Offices, Trowbridge.
Dec. 2	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
	ENGINEERING—		
Nov. 3	Saltley—Oil Gas Works	Midland Railway Company	Engineer, Midland Railway Station, Derby.
,, 3	Sydney, New South Wales, Australia—Refuse Destructors	Municipal Council	J. R. Palmer, Town Clerk, Sydney.
,, 4	Bahia, Brazil—Lighting Town	....	British Consulate, 6, Great Winchester-street, E.C.
,, 4	Faversham—Sinking Well	Water Company, Ltd.	B. Latham, 13, Victoria-street, Westminster.
,, 6	Llandudno—Electrical Plant	Urban District Council	Preece and Carden, 13, Queen Anne's-gate, Westminster.
,, 6	Worcester—Covering Tank at Waterworks	Corporation	T. Caink, City Engineer, Guildhall, Worcester.
,, 6	Maidstone—Electric Lighting of Borough	Corporation	Stevens and Barkes, St. Peter-street, Maidstone.
,, 7	Strabane, Ireland—Erecting Pump	Rural District Council	J. E. Sharkie, Clerk, Strabane, Ireland.
,, 8	Wrexham—Electrical Plant	Town Council	W. H. Trentham, 39, Victoria-street, Westminster, S.W.
,, 10	East Retford—Machinery, &c., for Treating Sewage	Corporation	J. C. Melliss, 264, Gresham House, Old Broad-street, E.C.
,, 11	Latheronwheel, Caithness—Breakwater	County Council	J. Brims, County Clerk, Thurso.
,, 11	Warrington—Covered Concrete Service Reservoir	Corporation	J. Deas, Engineer, Bank House, Warrington.
,, 13	Llandudno—Extension of Outfall	Urban District Council	E. P. Stephenson, Council's Engineer, Llandudno.
,, 13	Croydon—Electric Lighting Workhouse, &c.	Guardians	A. W. Sclater, 182, Oxford-street, London, W.
,, 14	Birkenhead—Electrical Plant	Corporation	W. Bates, Borough Electrical Engineer, Birkenhead.
,, 14	London, S.W.—Overhead Traveller in Engine House	London County Council	Engineer's Dept., County Hall, Spring Gardens, S.W.
,, 14	Birkenhead—Electric Motor-cars for Tramways	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
,, 14	Glasgow—Engines	Corporation	J. Young, 88, Renfield-street, Glasgow.
,, 15	Blackburn—Destructor	....	W. Stubbs, Borough Engineer, Blackburn.
,, 15	Hoylake, Cheshire—Electric Lighting	Urban District Council	T. L. Miller, 7, Tower-buildings N., Water-st., Liverpool.
,, 15	Bodmin—Water Supply Works	Rural District Council	W. J. Jenkins, Surveyor, Bodmin.
,, 15	Clacton-on-Sea—Laying Main, &c.	Urban District Council	J. Taylor, Sons & S. Crimp, 27, Great George-street, S.W.
,, 17	Leeds—Water Mains	Corporation	T. Hewson, City Engineer, Municipal Buildings, Leeds.
,, 17	Runcorn—Waterworks	Rural District Council	G. F. Ashton, 71, High-street, Runcorn.
,, 22	Middlesbrough—Condensing Plant and Pipework	Electric Lighting Committee	R. Hammond, 61, Victoria-street, Westminster, S.W.
,, 30	Port Elizabeth—Railway	....	General Manager of Railways, Capetown.
Dec. 30	Panama—Aqueduct	Authorities	Commercial Department, Foreign Office, Whitehall, S.W.
,, 31	Porto Alegre—Electric	Municipality	Commercial Department, Foreign Office, Whitehall, S.W.
Jan. 3	Concepcion—Drainage and Waterworks	Chilian Government	Commercial Department, Foreign Office, Whitehall, S.W.
,, 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
	IRON AND STEEL—		
Nov. 6	Clacton-on-Sea—Cast-iron Pipes	Urban District Council	S. Francis, Engineer, Town Hall Buildings, Clacton-on-Sea.
,, 6	Edinburgh—Cast-iron Pipes	District Water Trustees	J. Wilson, 72A, George-street, Edinburgh.
,, 6	Swansea—Pair Wrought-iron Gates	Grammar School Governors	L. C. Lewis, Secretary, Grammar School, Swansea.
,, 7	Watford—Iron Emergency Staircases	Union Guardians	C. P. Ayres, 14A, High-street, Watford.
,, 10	Birmingham—Various Stores	Corporation	E. A. Lees, 44, Broad-street, Birmingham.
,, 13	London, E.C.—Railway Stores	Burma Railways Co., Ltd.	Offices, 78, Gresham-house, Old Broad-street, E.C.
,, 20	Glasgow—Cast-iron Pipes	Corporation Electricity Department	Sir J. Marwick, Town Clerk, City-chambers, Glasgow.
	PAINTING AND PLUMBING—		
Nov. 6	London, S.E.—Painting and Decorating Town Hall, &c.	Bermondsey Vestry	F. Ryall, Vestry Clerk, Town Hall, Bermondsey.
,, 10	Birmingham—Lead Piping, Pig Lead, Paints, &c.	Corporation	E. A. Lees, 44, Broad-street, Birmingham.
,, 15	Manchester—Pipes, Baths, and Fittings	Baths Committee	City Surveyor, Town Hall, Manchester.
	ROADS—		
Nov. 3	Cromer—Road Works	Urban District Council	A. F. Scott, Surveyor, Church-street, Cromer.
,, 3	Hessle, Hull—Metalling	Sculcoates Union Guardians	T. B. Atkinson, 11, Trinity House-lane, Hull.
,, 3	Deansgrange, Ireland—Sea Gravel	Joint Burial Board	W. Burnell, Deansgrange Cemetery, Monkstown, co. Dublin.
,, 3	London, S.W.—Horse Hire	London County Council	Parks' Department, 9, Spring-gardens, S.W.
,, 4	Manchester—Granite Setts	Tramways Committee	J. M. M'Elroy, Secretary, Tramways Department, Town Hall, Manchester.
,, 4	Eastbourne—Road Works	Highways and Drainage Committee	R. M. Gloyne, Borough Engineer, Town Hall, Eastbourne.
,, 6	Armagh—Materials	Urban District Council	J. C. Boyle, Town Surveyor, Charlemont-place, Armagh.
,, 6	Alvestoke—Cemetery Works	Burial Board	H. A. F. Smith, Surveyor, Star-chbrs., High-st., Gosport.
,, 6	London, W.—Crushed Thames Shingle	Paddington Vestry	Surveyor, Vestry Hall, Harrow-road, W.
,, 6	Bermondsey, S.E.—Vans and Carts	St. Mary Magdalen's Vestry	R. J. Angell, Bermondsey Town Hall, Spa-road, S.E.
,, 6	Erith, Kent—Street Works	Urban District Council	Surveyor to Council, High-street, Erith.
,, 6	Teddington—Granite and Flints	Urban District Council	M. Hainsworth, Surveyor, Council's Office, Teddington.
,, 7	Leyton—Making-up Streets, &c.	Urban District Council	W. Dawson, Surveyor, Town Hall, Leyton.
,, 7	Camberley, Surrey—Levelling, &c., Street	Urban District Council	W. J. Hodgson, Surveyor, High-street, Camberley.
,, 7	Frimley, Surrey—Improvements	Urban District Council	W. J. Hodgson, Surveyor, High street, Camberley.
,, 8	Old Hill, Staffs.—Road Works	Rowley Regis Urban District Council	D. Wright, Clerk, Council Offices, Lawrence-lane, Old Hill.
,, 14	Southampton—Asphalting	Corporation	W. B. G. Bennett, Borough Engineer, Municipal Offices, Southampton.
	SANITARY—		
Nov. 3	Bulk, Lancaster—Scavenging	Rural District Council	J. Ennion, 5, Dalton-square, Lancaster.
,, 3	Thurnham, Lancaster—Scavenging	Rural District Council	J. Ennion, 5, Dalton-square, Lancaster.
,, 4	Swindon—Sewage Disposal Works	Cricklade Rural District Council	N. J. Cuss, Council's Engineer, Cricklade.
,, 6	Ewell, Surrey—Scavenging	Parish Council	G. Hards, Clerk, High-street, Ewell.
,, 6	Frinton-on-Sea—Laying Sewer	Tendring Rural District Council	T. W. Golds, 9, Landermere-road, Thorpe-le-Soken.
,, 6	Teddington—Stoneware Pipe Sewer	Urban District Council	M. Hainsworth, Surveyor, Council Offices, Teddington.
,, 6	Hendon, N.W.—Sewerage, &c., Works	Urban District Council	S. S. Grimley, Engineer, Public Offices, Hendon, N.W.
,, 7	Mistley, Essex—Removal of House Refuse	Tendring Rural District Council	T. W. Golds, 9, Landermere-road, Thorpe-le-Soken.
,, 7	Leyton—Brick Main Sewers, &c.	Urban District Council	W. Dawson, Council's Surveyor, Town Hall, Leyton.
,, 8	Ryton-on-Tyne—Sewer	Urban District Council	J. P. Dalton, Surveyor, Council Offices, Ryton.
,, 10	Darton, Yorks.—Sewerage Works	Urban District Council	W. H. Radford, Pelham-chambers, Angel-row, Nottingham.
,, 11	Kingsclere, Berks.—Drainage Works	Rural District Council	J. Barnes, Clerk, Kingsclere.
,, 11	Billericay, Essex—Stoneware Pipe Sewers, Sewage Disposal Works, &c.	Rural District Council	Bailey-Denton, Son and Lawford, Palace-chambers, 9, Bridge-street, Westminster.
,, 15	Cuckfield, Sussex—Stoneware Pipe Sewers, &c.	Rural District Council	J. Mansergh, 5, Victoria-street, Westminster.
,, 15	Morecambe—Sewers, &c.	Urban District Council	Beesley, Son and Nichols, 11, Victoria-st., Westminster, S.W

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Nov. 30	St. Agnes, Cornwall—Water Scheme	£25	J. Angwin, Clerk to Parochial Committee, St. Agnes.
,, 30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *vid* New York.
Dec. 1	Bury, Lancs.—Infectious Diseases Hospital	£100, £50, £25	Borough Engineer Corporation Offices, Bury.
,, 15	Lynn—Council Chamber and Offices	£25, £15	W. Mullard, Clerk to Urban District Council, Lynn.

Property and Land Sales.

FREEHOLD BUILDING LAND for SALE at Basingstoke; about 20 acres possessing a frontage of 1,400ft. to main road, and within ten minutes' walk of centre of the rising town of Basingstoke; gas and water; small villa residences in great demand; splendid investment.—T. J. Edney, Winchester-street, Basingstoke. 1

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Other appointments for intermediate Sales will also be arranged.

Thursday, Nov. 16 | Thursday, Dec. 7
Thursday, Nov. 23 | Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

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Particulars at the Mart; of Messrs Morrell and Son, Solicitors, Oxford; and Messrs. Paines, Blyth, and Huxtable, Solicitors, No. 14, St. Helen's-place, E.C.; and at Messrs. Edwin Fox and Bousfield's Office, 99, Gresham-street, Bank, E.C.

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Particulars, with condition of letting and plans, can be had of Henry I. Coburn, Esq., Solicitor, 54, Leadenhall-street, E.C.; or of the Auctioneers, 3, King-street, Cheapside, E.C., or at their Branch Office, 95, Leadenhall-street, E.C. Telegraphic Address, "Wonderment," London.

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Construction of Roofs (Tarn)	**1s. 6d.**
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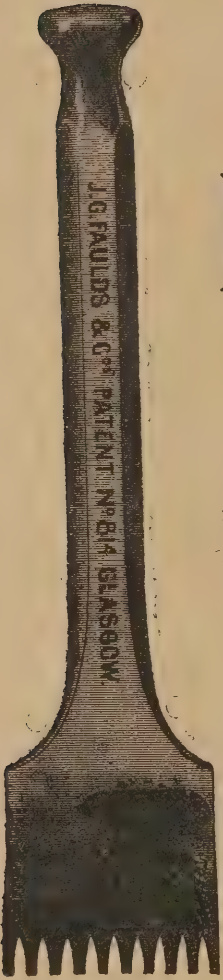
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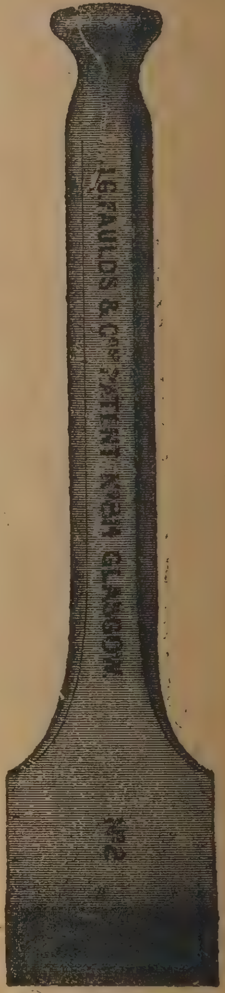
[illegible] Drove, showing Cutter in Slot.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Effingham House,
Arundel Street,
Strand, W.C.

SIR ARTHUR BLOMFIELD.

AN APPRECIATION BY WILLIAM A. PITE, F.R.I.B.A.

THE sudden and tragic passing away of Sir Arthur Blomfield while playing a game of billiards with a brother architect on Monday evening in last week at the Royal Societies Club makes a gap in the profession which cannot but be deplored. His death removes one of the few remaining links with the Gothic revivalists we have left, and his executed works exhibit a sincere and lifelong devotion to the mediæval tradition and precedent which the survivors of that school would say could not be bettered.

Arthur Blomfield was a son of a former Bishop of London, and was born at Fulham Palace in 1829. Educated at Rugby under Tait, he passed to Trinity College, Cambridge, where he graduated B.A. in 1851, and with this good groundwork he entered the office of the late Mr. P. C. Hardwick, of Cavendish Square, as pupil, where he remained for two years. There he had as colleagues, among others, T. Roger Smith, S. J. Nichol, C. L. Eastlake, F. Pepys Cockerell, and C. Forster Hayward.

Mr. Hardwick placed young Blomfield in a room alone, and he rather isolated himself from his colleagues at the outset of his career, but they apparently soon fished him out of his immolation into the general office, nicknaming him the Bishop, and then the general characteristics of the man displayed themselves, and many are the amusing stories of practical joking and skylarking, a mitre by his admiring friends making constant appearance on anything he did.

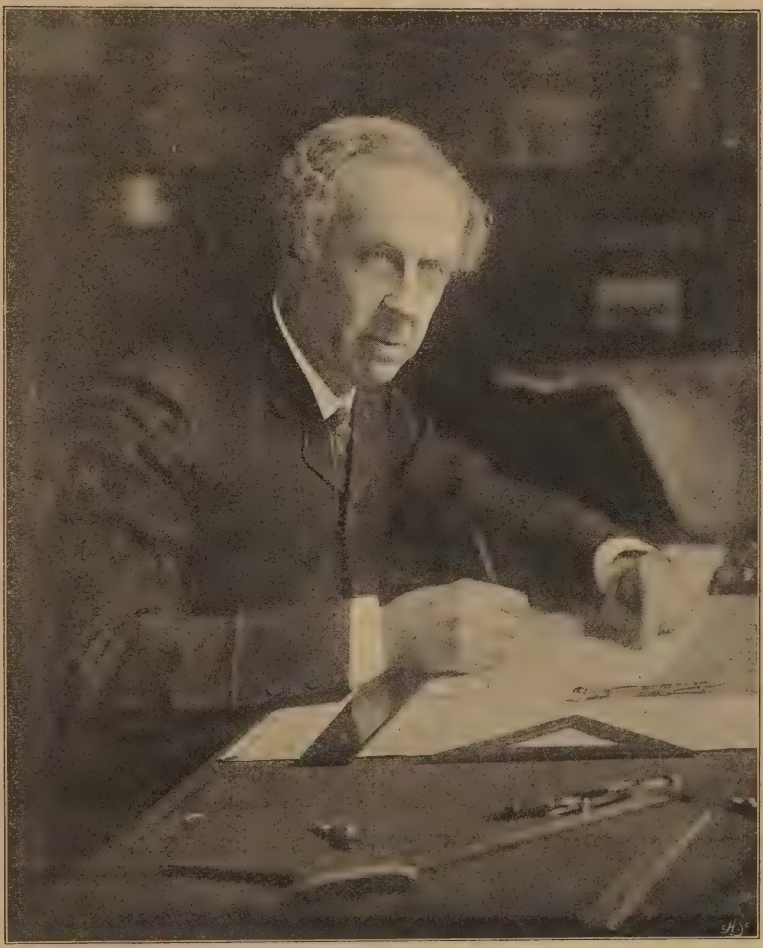
Mr. Hardwick's staff at this time seem to have been endowed with gifts besides those of architecture, for they blossomed out into office doggerel, of which some examples are still extant. The gifted Charles Eastlake, the author of "A History of the Gothic Revival," wrote the following lines concerning Blomfield nearly fifty years ago. They are so prophetic of the coming man and so characteristic withal, that they may well be quoted—

> Imprimus Bromlake,
> Be more industrious for success you'll find
> When energy with talent is combined.

These two needful elements were distinctive marks of Blomfield from the first, until he laid his pencil down last week.

Work he did! and with enthusiasm. After spending, as he said, "two years inking in Nichol's drawings," he left Mr. Hardwick's and departed on his travels with Cockerell. His draughtsmanship of that date, in sketching, exhibit light, delicate and careful treatment. No doubt he got much assistance from his instruction in drawing under Mr. J. D. Harding, while it is known that Mr. H. W. Brewer was a visitor to the office. His first work, that of St. Paul's, Haggerstone, was given to him by Mr. Hardwick, who somehow did not want the commission; however, what difficulties there were, Blomfield overcame, and with this start and with the valuable connection which a son of a Bishop of London must have, and by dint of laborious personal effort, from his office on Adelphi Terrace he firmly laid the foundation of one of the most successful practices of modern times. Firmly established, his success was now secure; and the long list of his works testifies to a life of enthusiasm for his art and of much usefulness to the community at large.

As time went on, honours and distinction crowded upon him, but none of these varied his distinctive modesty and natural charm of manner. It was his good fortune to receive many marks of Royal favour; he was the recipient of the Order of the Danebrog from the King of Denmark when the Prince and Princess of Wales opened the English church of St. Alban at Copenhagen; he was the architect also of the Duke of Albany Memorial Church at Cannes, and worked for the Prince of Wales at Sandringham. In 1889, on the opening of his additions to Eton College, he received from Her Majesty the distinction of knighthood; but no honour was probably more valued by Sir Arthur than the Royal Gold Medal, the Queen's gift, which he received in 1891, and for which he was recommended by the universal goodwill of his colleagues at the Royal Institute of British Architects.



Photographed by Ralph W. Robinson Redhill, and Guildford.

THE LATE SIR ARTHUR W. BLOMFIELD.

This is neither the time nor the opportunity for critically examining Sir Arthur Blomfield's executed works; that time will lay a kindly hand on them, and that they will never be devoid of interest we are not afraid to affirm; and his many works, spread over as they are in every part of the country, will remain an abiding monument to a distinguished architect.

Sir Arthur Blomfield has seemed to me to always convey the impression of real thoroughness. While not affecting in any degree to be original in conception, inspired by the traditions of the Gothic Revival, his hold on that method never slackened, while he was thoroughly conversant with its difficulties and limitations. Essentially an Ecclesiastical architect, his work generally had this *motif* feeling imparted, whether he had ample means at his disposal or a cheap church to build; in the latter case he was generally very happy in his results. He was a very rapid worker and has been known to bring complete sketches of a church, ready for working out, to the office, between the interval from Saturday to Monday.

When any man is removed from the scene of human activity, there is generally some one man upon whom his mantle falls. This was essentially the case with Sir G. G. Scott, G. E. Street, and J. L. Pearson, and some of their well-known Ecclesiastical appointments deservedly fell to the lot of Sir Arthur, and to the chapters of several cathedrals and many less important structures he was the professional mentor.

It would be impossible to touch upon all Sir Arthur Blomfield's work; perhaps the most important is the rebuilding of St. Saviour's, Southwark. The many problems which this must have presented, may have seemed insuperable to success, but that a remarkable work is the outcome, nobody will deny, notwithstanding the fact that it does not carry with it that creative individualism which it would have received at the hands of other distinguished members of the same school.

Nobody but those who knew the late nave can appreciate the transformation which has been accomplished, and were there no record of what has taken place, the antiquary of the twenty-third century might find himself in a hopeless fog of facts.

Sir Arthur Blomfield seems to have been devoted to a phase of Perpendicular architecture which would not have been favoured by the early Revivalists, such as that, for instance, employed in Sion College, the Church House, and the little church in Great Marlborough Street. Work of this class has always seemed to me to be a pleasant echo of his master's Lincoln's Inn Buildings, which, although out of the office when Blomfield was at Cavendish Square, has remained one of the most deservedly admired products of that interesting epoch.

Blomfield was most successful with what must be designated as cheap churches—of these we may mention, for example, St. John's, Wilton Road, Pimlico, a fine dignified interior, mainly of brick, but admirably treated both in proportion and effect. St Peter's, Eton Square, to which St. John's is parochially attached, is an excellent example of his dexterity and skill in remodelling an existing building. He is understood to have looked upon Holy Trinity, Privett, as one of his most satisfactory works.

Although an ardent Gothicist, Sir Arthur has carried out Renaissance work in churches and secular buildings. It has been said that the man of Gothic training makes the best Classicist; be that as it may, it is not for me to say if this precept applies to Sir Arthur beyond to point out the broadness of the interests of the man. His facile pencil is fully in evidence in all his works, and there is an evenness and uniformity which impresses the fact that everything he did and undertook was his own, and not another's. In all his work there was a fine sense of detail, in many cases of a very refined character.

Sir Arthur Blomfield's name figured as the first in that remarkable manifesto to the "Times," in 1891, on "Architecture, a Profession or an Art," but he never followed it up, as some of the other able and amiable enthusiasts did, by emphasizing his protest in resigning his membership of the Royal Institute, which was not only a wise, but a far-seeing discretion. It is said that long standing devotion to certain social engagements to which he had become devoted, and which he was unwilling to relinquish for a time, alone prevented him from accepting the presidential chair at the Institute, but that he was warmly interested in every movement was clear. Only recently, at inconvenience to himself, he made time to attend and take part in the opening of the last building exhibition.

Sir Arthur was ever the friend of young men, and whether in his office or at the Academy Schools he was glad to be a young man himself, and his buoyancy of spirit testified to the spirit he imparted to those around him. Amongst many men who have either been his pupils—of whom he had many—or who have assisted him, may be named Frank T. Baggallay, T. Howard Ince, Fairfax B. Wade, and Geo. Washington Brown. His influence on men was very great, and will follow him, and can be summed up in the truism that what is worth doing at all is worth being thoroughly and well done to the best of our several gifts.

This brief and inadequate notice of a remarkable career too soon ended, may well be concluded in his own words which were true of Sir Arthur Blomfield to the end; speaking at the Royal Institute in June, 1891, after he had received the Royal Gold Medal, he said:—

"I do not hesitate to confess that I shall always be a student so long as I can hold a pencil or read a book, for I hold very strongly that the education of an architect is never complete, and when he feels it to be complete (if he ever does so) it is high time for him to be laid on the shelf. When I was a young architectural student, walking one day up Ludgate Hill, I met Professor Cockerell coming down. He stopped and greeted me in his usual kind and courtly manner, and laying his hand on my arm he said: 'Blomfield, when I look at that magnificent conception, and buildings such as that, I say to myself the men who could do work like that were giants; and what are we? Pigmies.' He said no more and walked on. But those words, coming from so eminent a man and so great an artist as Professor Cockerell struck me as very remarkable, and I have never forgotten them."

On Reflection.

The Cromwell Statue. IT might be supposed that, after a man had been dead a few hundred years and public feeling had cooled down, it would be possible to form a just and correct estimate of his life and works. Such, however, is not the case with Oliver Cromwell, whom some exalt to the skies, while others are very dubious as to his merits. Periodically he comes up for discussion; the most recent instance being in connection with his statue at Westminster, an illustration of which is given on one of our inset pages. Though Cromwell may be admired by many architects and artists, it can hardly be doubted that the men of the Commonwealth will always be regarded as foes to architecture and art, for it was due to their ruthless iconoclasm that many objects and buildings of beauty, interest, and worth, were destroyed. Still, of course, the Protector cannot be held responsible for all the extravagances and acts of vandalism of his followers. The statue which Lord Rosebery is to unveil next week is of bronze, and may be considered as one of the best works of Mr. W. Hamo Thornycroft, R.A. It faithfully reproduces the chief features in Cromwell's character—solidity and bravery—and is thoroughly natural. The Bible is held in one hand and the sword in the other, and the head of the figure is uncovered; the sword point enters the hard, rocky ground at his feet. The site chosen for the statue is in keeping with the statue itself, being solitary and severe, and Oliver stands with his back to Westminster Hall, where, at his command, Charles was sent to be tried. The statue has been erected at the cost of a person who wishes to remain anonymous, but who, however, is perfectly well known as the donor. Portland stone has been used for the pedestal, which is in the later Renaissance style, and is about 12ft. high, standing on a massive base also of Portland stone. This height of the pedestal was necessary in order to raise the statue (which itself is 10ft. high) from the sunken garden in which it is placed, so that it might be viewed at its best. At the base of the pedestal there is a bronze lion with the head erect and alert. Mr. Thornycroft worked chiefly from the drawing by Mr. Samuel Cooper, now at Sydney Sussex College, Cambridge, which is the basis of most of the best portraits; numerous other portraits, in the British Museum and elsewhere, have also been studied, with a result which, in our opinion, is highly satisfactory and pleasing.

Temple Building. A BRITISH Imperial policy must necessarily always be the cause of fierce controversy, but, putting aside political considerations, the professional man must not lose sight of the fact that it may at one time or other enable him to do something quite unconventional. This is what it has done for Mr. Donnan, an engineer of Mandalay, who recently built, aided by native workmen, a Buddhist temple for a Board of Burmese trustees. Some years ago, in the reign of the good King Theebaw, who kept rubies and emeralds in barrels in his palace, the wooden pagoda which sheltered the colossal statue of Buddha at Mandalay was burned. The statue itself, although so heated that streams of melted gold ran from its surface, was saved, through the heroism of the townspeople and the palace officials. Soon after this, we British, who had long disapproved of King Theebaw's conduct, made a descent upon him, killed a large number of his subjects, stole his rubies and emeralds, and, incidentally, annexed his kingdom to our Indian possessions. Under our rule the city of Mandalay prospered, and the pious inhabitants found themselves at last in a position to re-house their miraculous statue, which, according to their legends, had received from the breath of Buddha himself the power of walking and talking. After a long discussion it was decided, on the advice of English engineers, to construct the new temple of masonry, and Mr. Hoyne Fox, a professional architect and Government engineer at Rangoon prepared a design, which was approved and carried out under the supervision of Mr. Donnan. The design, in the traditional Burmese style, was cleverly rendered in masonry by Mr. Fox and carried out apparently with great skill; the stagings being erected over the head of the statue, which it would, of course, have been sacrilegious to disturb. This circumstance caused a little embarrassment. The barefooted native workmen found that the lime mortar burned their feet as they walked over the masonry, and put on slippers to protect themselves. Some priests noticed this, and denounced the disrespect to the god involved in wearing shoes over his head: but after a strike had lasted for three weeks the priests withdrew their objection. As the building approached completion, astrologers were consulted in regard to the selection of an auspicious day for the raising of the finial,—a step which, in the building of pagodas, is celebrated by a public festival. In this case, the finial consisted of seven heavy rings surmounted by a ball, and the festival continued for eight days, one ring being set each day for a week, the fixing of the ball, accompanied by a salute of fifteen guns, marking the final day. Mr. Donnan says, in the "Indian Engineer," that he had read in the Burmese records that when public works were opened an earthquake was always felt, produced by the "nats," or good spirits of Heaven, in token of their approval. Remembering this, he observed to some of the native spectators in the course of the festivities that, in order to have the celebration complete, there should be an earthquake to show the approval of the "nats." The morning after making this remark, a shock of earthquake was distinctly felt, showing that the nats like to see English engineers building heathen temples.

"'SPECIFICATION' is a splendid book."

THE LATE SIR ARTHUR BLOMFIELD.

WE regret to record the death of Sir Arthur William Blomfield, M.A., A.R.A., F.S.A., F.R.I.B.A., the distinguished ecclesiastical architect. He died quite suddenly before medical aid could reach him, on Monday night, October 30th, death being due to seizure with syncope from heart disease, while at his club.

Sir Arthur Blomfield was the fourth son of the Right Rev. Charles James Blomfield, Bishop of London from 1828 to 1857, and of Dorothy, daughter of Mr. Charles Cox, and he was the brother of Admiral Blomfield, and of the late Bishop of Colchester. He was born at Fulham Palace on March 6th, 1829, and was educated at Rugby and at Trinity College, Cambridge, graduating B.A. in 1851 and M.A. in 1854. After leaving Cambridge he entered the office of Mr. Philip Charles Hardwick, at that time architect to the Bank of England, serving his apprenticeship under him for three years. His practice as an architect began when the Gothic Revival was in full swing, and he attached himself to it throughout his career. With Pearson, Street, and Scott he may be regarded as one of the leading exponents of modern ecclesiastical Gothic, his sympathies lying with the older Gothic tradition. Just after leaving Mr. Hardwick he made a tour on the Continent with Mr. F. P. Cockerell, son of the great Professor. Sir Arthur was a man of untiring energy and power of work. He mostly worked in the Perpendicular style of Gothic, but also built in classic styles. He was a conversationalist of great charm, and was everywhere popular.

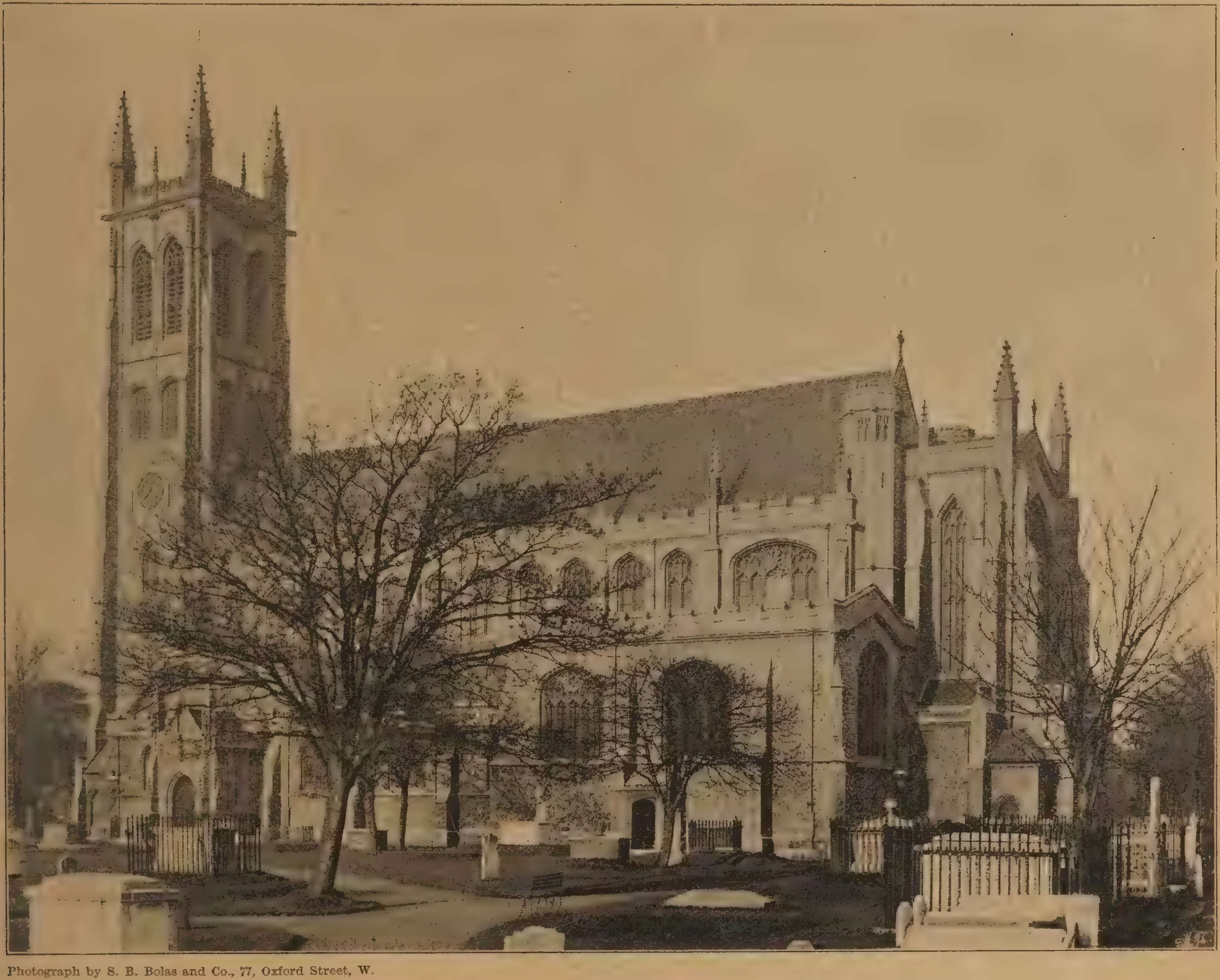
He was twice married — first to Caroline, daughter of Mr. Charles Case Smith, who died in 1882, and, secondly, to Sara Louisa, daughter of Mr. Matthew Ryan. In 1861 he became president of the Architectural Association, and was elected a Fellow of the Royal Institute of British Architects in 1867. On the death of Mr. George E. Street he completed, with Mr. A. E. Street, the New Law Courts in the Strand. In 1883 he was appointed architect to the Bank of England. In 1886 he was elected vice-president of the R.I.B.A., and held office for three years. In 1887 he designed the Church of St. Alban for the English-speaking congregation in Copenhagen, was elected an honorary member of the Danish Royal Academy of Arts, and received the Order of the Danebrog (Third Class) from the King of Denmark. In 1888 Mr. Blomfield was elected an Associate of the Royal Academy. Shortly after the opening of the new Queen's School and Lower Chapel at Eton College, which he built, by Her Majesty in 1889, he received his knighthood. The gold medal of the R.I.B.A. was conferred on him in 1891. In addition to the appointment mentioned be held that of architect to Lincoln Cathedral. He was appointed in 1899 architect to the Committee for the Restoration of Chichester Cathedral. Both these appointments were in succession to Mr. Pearson. He was also diocesan architect to Winchester Cathedral and one of the trustees of the Soane Museum. During the last few years he had taken into partnership his two sons, Mr. Charles J. Blomfield and Mr. Arthur C. Blomfield, M.A.

Sir Arthur was an excellent actor, and at one period of his life frequently took part in amateur theatricals at St. George's Hall and elsewhere, or in drawing-room entertainments of his own composition at his house in Montagu Square. In his younger days his chief recreation was in rowing.

The principal works he had in hand at the time of his death were the Church House at Westminster and the new Christ's Hospital at Horsham. The former promises to be one of his best examples in his favourite style, and of the portion already completed the roof of the great hall is a fine piece of work.

Sir Arthur carried out a very large number of restorations to old churches, and perhaps, the most interesting of these, was the rebuilding of the nave of St. Saviour's, Southwark, a description of which will be found on the next page. His most important mansion was Denton Manor in Lincolnshire, which he built for Sir William Welby Gregory, Bart. He carried out the Bancroft School at Woodford for the Drapers' Company, and the new great school and later buildings at Charterhouse, Godalming, and the new buildings for Shrewsbury School. In London he built the Law Courts Branch of the Bank of England; Sion College Library on the Thames Embankment; St. Saviour's Church in Oxford Street (1871); the Whitgift Hospital School at Croydon; the Church of St. John, Wilton Road; and the enlargement and remodelling of St. Peter's, Eaton Square.

Perhaps his church at Portsea, illustrated on this page, is his masterpiece. He did not build the tower, which is an old one. The establishment of this church was due to the generosity



Photograph by S. B. Bolas and Co., 77, Oxford Street, W.

ST. MARY'S CHURCH, PORTSEA. THE LATE SIR ARTHUR W. BLOMFIELD, ARCHITECT.

"Your very useful periodical, 'SPECIFICATION'"

of the late Mr. W. H. Smith, and the building shows a specimen of design unequalled by that of any of his contemporaries.

The church of St. George, at Cannes, consecrated in February 1887, was built by Sir Arthur Blomfield as a memorial of the Duke of Albany, and includes a small side chapel containing a replica of the monument by Sir Edgar Boehm, R.A., in the Memorial Chapel, at Windsor. He built the little church of St. Moritz, and, on the other side of the Atlantic, the Cathedral of St. George, at George Town, Demerara, which, owing to the nature of the soil, had to be constructed principally of timber, the whole resting on a kind of raft of concrete. The church of the Falkland Islands had to be built from materials, except the rough building stone and sand, sent out from England. He repaired and strengthened the tower and spire of Salisbury Cathedral, and carried out restoration work at Canterbury Cathedral.

Lately he had erected a school chapel at Malvern College; West End Church at Southampton; Junior School at St. Edmund's School, Canterbury; Cathedral Library and Meeting-room at Hereford; chapel at Queen Anne's School, Caversham; and a new nave and tower to Leamington Parish Church.

The funeral of Sir Arthur Blomfield took place at Broadway, Worcestershire, last Friday, at twelve o'clock. A memorial service was held at St. Mary's, Bryanston Square, at the same hour. There was a large congregation, those present including Sir John Taylor, Sir William Robinson, Sir James and Mr. Henry Blyth, the Archdeacon of Maidstone (representing the Dean and Chapter of Canterbury), Canon Duckworth, Canon Hervey, Canon Routledge, Mrs. George Blomfield and Miss Blomfield, Professor Aitchison, R.A., Mr. Ouless, R.A., Mr. Frank Dicksee, R.A., Mr. A. Parsons, A.R.A., Mr. Aston Webb, A.R.A., Mr. Kenneth Graham (secretary of the Bank of England), Mr. S. Flamank (secretary of the Corporation of the Church-house), Mr. Phené Spiers, Mr. Pinero, Mr. John Richmond, Mr. William Emerson (president of the Royal Institute of British Architects), Mr. Alexander Graham (hon. secretary of the R.I.B.A.), Mr. W. J. Locke (secretary of the R.I.B.A.), Mr. J. T. Lee, Dr. Holman, Dr. Ogle, Mr. D. Irvine (secretary of the Arts Club), Mr. C. L. Eastlake, Mr. R. Barrett, the Rev. E. Lascelles, Mr. E. H. Martineau, Mr. Royds, Mr. E. W. Mountford, Mr. Frank Pearson, Mr. Bereford Pite, Mr. G. H. Birch, Mr. E. Crofts, Mr. John Leighton, Mr. G. E. Monckton, and Mr. G. H. Fellowes Prynne (president of the Architectural Association). The service was conducted by the Archdeacon of London, assisted by the Rev. R. Dixon Box. In the course of a brief address, Archdeacon Sinclair said that Sir Arthur Blomfield stood with Ruskin, Pugin, Barry, Scott, Street and Pearson in restoring pointed or Gothic architecture as a science, with principles and laws of its own, instead of being, as it had been mainly in the hands of previous revivers, an imperfectly understood medley of beautiful details merely to be reproduced in ill-adapted imitation without system or proportion. His beautiful style was that thoroughly English one which prevailed from Edward III. to Elizabeth, though, as was shown by the church of St. Barnabas, at Oxford, he could adapt himself to any style that was chosen. Probably no architect had built or restored so many churches, and there were few countries where he had not left evidences of his taste and skill. Hundreds of beautiful churches all over the country proclaimed at once, by the purity of their style, their admirable proportions, and their adaptation to their needs, that they were the work of Blomfield. The members of his family who were mourning his loss would, at any rate, have the consolation of knowing that their sorrow was shared by all who knew Arthur Blomfield.

A New Liberal Club at St. Albans, recently opened, has been built by Mr. E. Dunham, of St. Albans, at a cost of about £900, from the plans and under the superintendence of Mr. S. Doddimeade Edmunds, of St. Albans, and Bow, E.

SIR A. BLOMFIELD'S WORK AT ST. SAVIOUR'S, SOUTHWARK.

By CHARLES G. HARPER.

MOST important among Sir Arthur Blomfield's later activities was his restoration of St. Saviour's, Southwark. This ancient building, formerly known as St. Mary Overie, has seen many changes since the time when it was founded as the nunnery, according to tradition, of "St. Mary of the Ferry," by the daughters of the ferryman who is said to have held the rights of the ferry across the Thames just at this spot. When the Dissolution of the monasteries came in the time of Henry the Eighth, the church belonged to an Augustinian Priory. At that period the late thirteenth century nave was vaulted in wood. A great deal was destroyed when the buildings were handed over to the Royal Commissioners, and although the people of Southwark, in their piety, leased the church from the Crown and finally purchased it outright for £800, in the days of the mercenary James the First those buildings that were not of purely ecclesiastical use were pulled down and their stones dispersed. It remained, however, for the nineteenth century to create the greatest havoc here. The Magdalen Chapel, on the south side was destroyed, and the Lady Chapel (not to be confounded with the existing Retro-choir which is sometimes given that name) was demolished about 1840 in order to make an approach to London Bridge Railway Station.

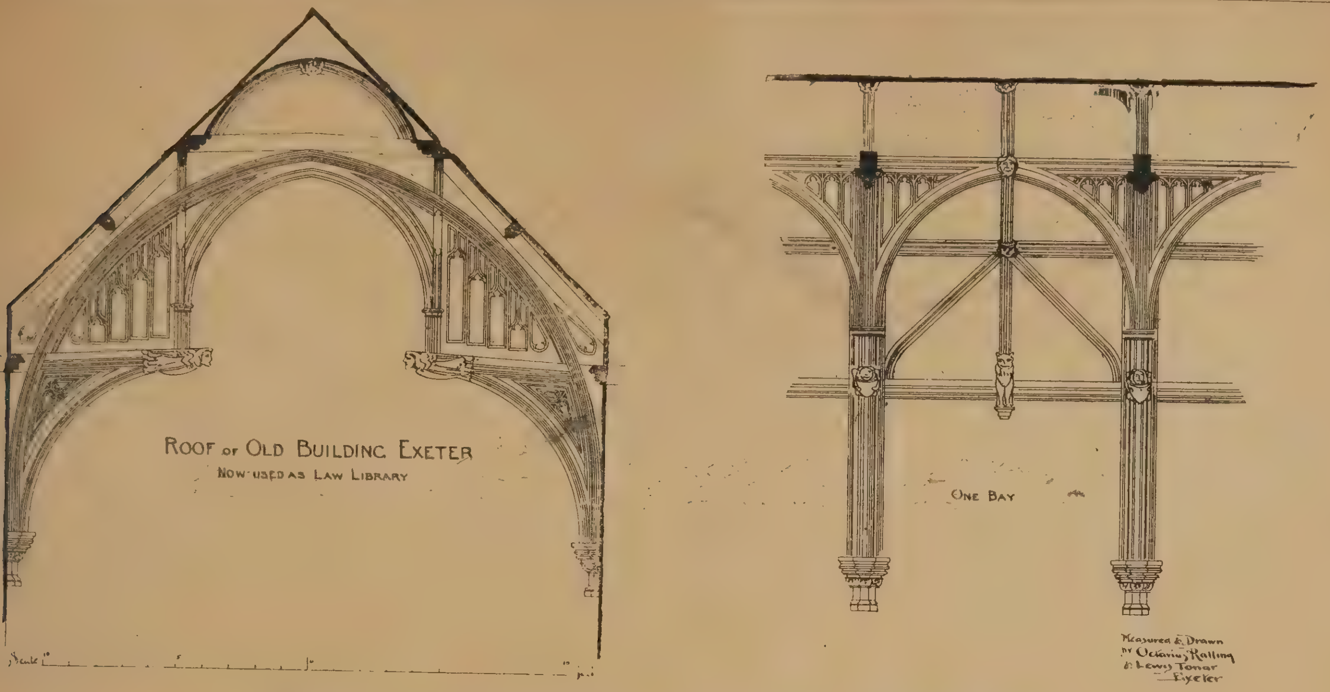
It is essential, for the proper understanding of Blomfield's work here, to know the architectural history of St. Saviour's from this time onward. No more unpromising work than this great restoration presented, nor one less thankless in these critical days, could be conceived to which to set one's hand. The very situation of the great church is unhappy. Railways, and the fruit and vegetable markets of the Borough, hem it in closely, and Barclay and Perkins' great brewery at the west end does not form an ideal landmark of a cathedral close. Despite these disadvantages, and the really terrible "restorations" at the east end by Cottingham or another early in the century, St. Saviour's is externally a noble and an imposing building, cathedral-like in dignity as well as in its cruciform plan; its central tower is a familiar feature. For nearly four centuries that tower has held this position, and in the old etchings of Hollar and his fellow antiquaries of Queen Elizabeth's time you still see it, the one great recognisable feature of Southwark.

Blomfield's work was almost wholly concerned with the rebuilding of the nave, the south transept, and the general restoration of the interior. Nearly nine and a half years ago, in July, 1890, the Prince of Wales laid the foundation stone of the new nave, and the restored, and in great measure reconstructed, church (in the meanwhile elevated to the status of a cathedral for the Suffragan Bishop of Southwark) was not reopened until February 16th, 1897. There was little or no controversy as to what should be done or what left undone in this restoration, for so greatly had the building been wrecked that the most ardent anti-restorationist could not for very shame bid the architect or the Restoration Committee stay their hands. Entering by the south porch, which is wholly Blomfield's work, one is immediately impressed by the length and beauty of his Early English nave. It may be interesting at this point to give a few comparisons of St. Saviour's with the measurements of two or three of our other cathedrals. Winchester is, of course, the largest, measuring over all from east to west 560ft. St. Saviour's measures 292ft., and thus falls little short of Rochester, which extends to 306ft. in all.

The nave consists of seven bays, rebuilt by Blomfield in that chaste and impressive Early English style, of which so few traces had been left by time, great conflagrations, and the falling of the stone vaulting in 1469, to say nothing of the wilful mutilations and the cementing of a later era. There have not been wanting those critics of Blomfield's career who have damned his work as belonging to that "old school" of Gothic revivalists whose buildings and restorations were possibly academically correct, but

DRAWN BY OCTAVIUS RALLING.

"The remarkable publication, 'SPECIFICATION.'"



ROOF OF LAW LIBRARY, EXETER. MEASURED AND DRAWN BY OCTAVIUS RALLING.

lacked the vivifying touch of enlightened sympathy. But here, at any rate, he was more than an architectural Owen, and did more than coldly reconstruct a nave from battered piers and half obliterated mouldings. In St. Saviour's nave he has made Early English to live again in fact and in feeling, and for this it is possible to forgive him his Law Courts Branch of the Bank of England, much more than we can find it in our hearts to forgive the Gothic Scott for his would-be Renaissance Government buildings in Whitehall, although, to be sure, the style of that Bank plumbs a deeper depth than that of those buildings, just as Blomfield's supple Gothic reaches a higher pitch of artistry than Scott's unvarying formula in that *genre.*

It is not often given to a man to be personal in a restoration, and yet to satisfy the critics. This is rightly so; for to set one's own stamp upon a pure restoration can readily be argued as an artistic and an archæological crime. Here, however, in the actual amount of reconstruction to be done in the nave, Blomfield is justified in the personal touch traceable. It is essentially a cheerful nave, and exquisitely proportioned and well lighted; the stone of piers and walls a warm cream colour, and the entirely new vaulting banded in cream and brown. This vaulting takes the place of a flat, wooden churchwarden's ceiling, which replaced the rotted fifteenth-century oaken vault. Ploughshare soffits give individuality, placed beside the clerestory windows. The present level of the nave floor is about a foot lower than before the restoration, and is laid with wood blocks. To those who knew St. Saviour's before these works the change is marvellous. £60,000 were expended upon them. With the floor and the transepts we have not so much concern in this place; it is the nave and the south porch that will remain as monuments of a great architect.

Bassalleg Church, Mon.—New boundary walls of red Risca and grey Forest stone, with ornamental wrought-iron railings and teak lych gates, are being erected round the churchyard of this interesting old church. The work is being carried out by Messrs. S. Shepton and Son, under the superintendence of Mr. C. B. Fowler; both of Cardiff.

A New Stand at Parkhead, Glasgow, which has been built for the Celtic Club at a cost of about £6,600, is 70yds. long, 46ft. deep, and has seating accommodation for 2,000. The seats are tip-up chairs, upholstered in green leather. In front the stand is fitted with glass windows, which can be raised at will, and so make the structure entirely open.

OLD EXETER.

ANYONE knowing Exeter is familiar with the picturesque buildings forming the Cathedral Close, varied as they are in style and character. The least pretentious externally are those shown in the accompanying sketches by Mr. Octavius Ralling, but they are, perhaps, the most interesting of all. One is the former residence of several of the old bishops, including bishops Oldham, Fox, and Courtenay, who have left emblems of their occupation in external or internal heraldic shields. The courtyard and entrance is one of the beauty spots of the city. Behind another of the buildings is a very fine old hall, now used as the Law Library, with a richly carved open-timber roof. This was probably used as the refectory of one of the monastic bodies. The house in Tudor Street is remarkable for the ornamental portion of the front of cut state hanging, the circles being filled with shields, fleur de lis, &c.

Professor Herkomer has had conferred on him the Knights' Cross of the Bavarian Order of Merit.

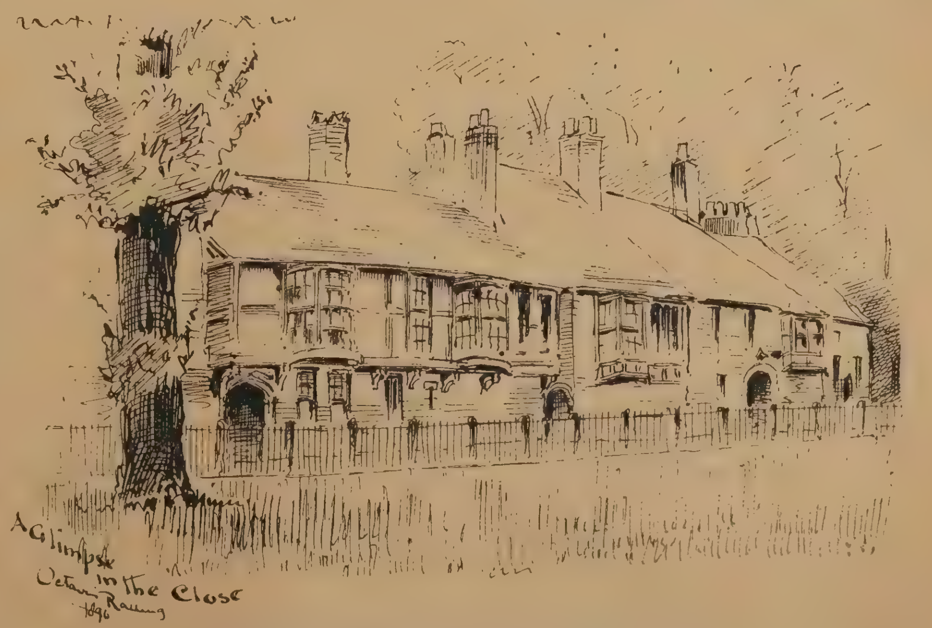
THE ARTS AND CRAFTS MOVEMENT.

By WALTER CRANE.

LAST Thursday evening at the New Gallery, Regent Street, W., the first of a series of lectures by members of the Arts and Crafts Exhibition Society was given by Mr. Walter Crane, president of the society, on "The Arts and Crafts Movement: its general tendency and possible outcome."

Mr. Crane, in opening his remarks, said it seemed a somewhat strange thing that the last quarter of this century, so progressive in the invention of machinery, should be characterized by a revival of the handicrafts. If all the epochs when such revivals had occurred were considered, it would be found that they were a natural outcome of the state of the public mind, and he thought that the present revival was no exception to this general rule. He would, therefore, look back on the movement as well as forward.

Standing upon our imaginary mountains and noting here and there significant land-



IN THE CLOSE, EXETER. DRAWN BY OCTAVIUS RALLING.

"The work will be found of great value."

marks which declared the way we had come, we saw many of the old traditions of the last century carried on into the present one; classical taste dominated our Architecture, striving hard to become domesticated, and sometimes looking dull. This gradually wore off when the middle of the century was reached; for instance, the simple old Chippendale furniture gave place to Ormolu and French glasses, &c.

The new naturalism then began to assert itself in all sorts of form, but industrial Art remained in the same state, things being done in the ordinary course of trade without anyone bothering about them. There was, however, at this time, one artist—Alfred Stevens—who spent his energies on domestic articles. This movement was mainly a sculptors' and modellers' movement and represented the naturalistic and Renaissance revival. Many and mixed elements contributed to the change, which might be traced to modes of thought which found expression in literature and poetry. William Morris appeared on the scene and the group of artists associated with him marked an epoch in England. The writings of Scott fostered quite a different kind of sentiment which had its use in keeping alive the interest in industrial life of olden days. He would not do more than mention the Gothic Revival in Architecture, as this subject would be dealt with in a later lecture of the series by Mr. Halsey Ricardo. The Gothic revival was an important point in this development of taste.

All these movements should be considered as so many streams which carried us on to the present revival of handicraft and design. Mr. H. Wilson would deal with the Pre-Raphaelite school in relation to the revival, and he (the speaker) would therefore not go into it further. Ruskin's writing was another great impulse, springing from his enthusiasm for truer ideals of Art and the study of Nature, which he so eloquently expressed. Despite all contradictions, mistakes even, Mr. Crane thought everyone who had come under Mr. Ruskin's influence would acknowledge the large part he played. It was a wholesome and stimulating influence, and should not be discountenanced by the mistakes he made, which, after all, were attributes of genius.

The initiation of the present revival was due to these many movements. One of the first in the revival was William Morris, who established his firm, the original idea of which was to give good furniture to the friends of the members, although the field of operations was extended later. Philip Webb helped in the movement, but his work was little known to the general public owing to its being mostly in private residences.

The publication of books dealing with many phrases of art and craft, while the treasures of the British Museum were opened to those who wished to really know what mediæval book-craft was like, helped to prepare the way for new ideas in craftsmanship. Associations were formed among artists for the discussion of such subjects; and among those intimately connected were also the architects Welby Pugin, William Burges, and Butterfield, who were fully alive to the value of the study of mediæval Art. Mr. Norman Shaw's work came later, and was more intimately connected with the movement, which owed so much to Architecture. Decorative artists may be said to have had nowhere to lay their heads, and so they laid their heads together. Mr. Lewis Day's society was absorbed into the Art Workers' Guild, which has since thrown out another branch, the Art Students' Guild.

These societies must be counted as educational to the public, and led to the formation, among others, of the national Society for the Encouragement of the Arts, Manufactures and Commerce, which held several congresses in the provinces as a scientific body might. Members of the Arts and Crafts Exhibition Society were always connected with these bodies, and when the Royal Academy was formed to hold national exhibitions in painting, &c., and also the crafts, they gave their support. The movement attracted a large number of adherents, especially in painting. But finding that the promoters were using this institution to promote their own personal ends the support was withdrawn, and the Arts and Crafts Exhibition Society was formed. William Morris did not join the Society until the programme had been defined, and the process of evolution was slow. Premises were at first difficult to obtain, but time seemed to help, and the New Gallery was opened. Here the first exhibition was held. The members were conscious that an exhibition was a necessary evil, for fragmentary pieces of Art could not be placed in their true relation and grouping, which was, of course, everything. The idea had from the first been to give opportunity for the craftsman to exhibit his work to the public. The ideals and aims were clearly set forth in the book of essays by members of the Society, which had been published recently. They wished to give artistic credit to nameless ones, who were concealed under the name of the firm who employed them; they had, perhaps, had more difficulty in this respect than in any other, and he again appealed to employers to help.

Looking back on the general character of their exhibitions, it was interesting to note the various influences that had affected them. A man's mature work differed from his youthful work, and if this took place with the individual, how much more might it be with a group of individuals! To the superficial observer the work was apt to be labelled as all alike. In one direction richness and artistic fancy seemed to have found a new field in jewellery, and gold- and silver-smiths' work, and the art of enamelling. This might be claimed as a direct result of the revival in artistic handicrafts.

Mr. Crane had ventured to say some years ago that we must turn our craftsmen into artists and our artists into craftsmen. This had occurred, but not so much with the latter as with the former. It was to be regretted that the English workman had been taught to look upon mechanical finish as an ideal. As a class the modern workman was engaged in an industrial war to raise his standard of life, or even to keep it, and it was to be hoped that the present system of education would help him. It was a significant fact that at the Central School of Arts and Crafts, under the direction of the London County Council, the majority of instructors were members of the Arts and Crafts Society.

The organised factory and machine industry would continue to work for the million as well as for the millionaire, but it would be a great good if groups of workmen or artists could raise standards of taste through the power and influence of their work. It was always possible for a Society to narrow down or widen; and this society had determined not to have any prejudices in regard to any particular school, but to deal only with the best work. They had seen great gaps in the ranks of men of design, and they were left to carry on the twin lamp of design and handicraft. They might well be of service in their exhibitions in maintaining the highest standard of design and handicraft, and this would be their aim.

Mr. J. Cobden-Sanderson, hon. secretary of the Society, announced that during November the New Gallery would be open until eight o'clock p.m., to enable craftsmen in business during the day to attend. The admission fee after 5.30 p.m. would be reduced to 6d. The next lecture will be given by Mr. H. Wilson, who will deal with "The Pre-Raphaelite School in relation to the revival of Design and Handicraft," on next Friday evening at, 8.30 p.m., and not on Thursday as first arranged.

A New Board School in Renfrew Road. Paisley, is to be built to accommodate 1400 scholars.

The Cardiff Empire Music Hall, which was gutted by fire last week, was designed by Mr. Matcham, of Nottingham, and cost about £25,000. It had a sliding roof, there were no columns to obstruct the view of the stage, and accommodation was provided for 1000 persons. The decorations of the auditorium were in the French Renaissance.

A VANISHED PARISIAN LANDMARK.

By GEORGE C. D'ALBI.

THE Parisians who travel on the penny boats between Auteuil and the Pont d'Austerlitz will no longer have to answer the unavoidable question of the English tourists: "I beg your pardon, sir, what is that?" *That* was a somewhat sad spectacle, and the Parisian, though light hearted enough, always winced a little in answering, more or less politely, according to his humour: "*That* is the remnant of the Palace of the Cour des Comptes, a fine building in its day." "Very long ago?" the English tourist would ask, if not well versed in French history, often taking the imposing ruins for those of a Capitole or of a Royal Palace dating from the Merovingian epoch. "Not so old as that—first Empire—destroyed in 1871 by the Commune." And the Parisian would say no more to the "Engliche" for, as a matter of fact, he did not like to talk much about this dumb, reproachful testimony of national madness, which, for the last twenty-seven years, has been left before his eyes, the last amongst the edifices destroyed by the Revolution of 1871. All the others have been razed to the ground or rebuilt. This last vestige also has now disappeared, and the Chambre des Députés, after discarding many others, has sanctioned the project which was brought before the Parliament in November, 1897, by the Orleans Railway Company, to buy the site occupied by the ruins and to build there a station, which is to be completed for the opening of the Exhibition in 1900. Visitors to Paris travelling over this line will be spared the tedious and expensive cab journey from the other side of the Jardin des Plantes; they will, instead, arrive on the Quai d'Orsay, in a square occupying the space between the river Seine and the Rues de Lille, Bellechesse, and Poitiers.

The Cour des Comptes, originally intended for the Foreign Office, was commenced in 1810 under Napoleon I., who took the greatest interest in the plans which were prepared by the architect Bonnard, prix de Rome. The Emperor, who, as everyone knows, had an unusual amount of confidence in himself, and meddled in everybody's affairs, insisted on having the plans brought to him once or twice a-week, and, as the wretched Bonnard wrote to one of his friends: "The big red pencil of his Majesty makes such a network of new lines on my drawings, altering and rearranging every detail, regardless of the practicability of his ideas from an architect's point of view, that *le bon Dieu* alone knows if I shall ever be able to complete the plans." Bonnard's presentiments proved to be correct, for the fall of the Autocrat and his own death took place before the completion of the Palace. After the Restoration, and under Charles X., the work was carried on slowly and without enthusiasm by Lacornée, who was a pupil of Bonnard, and, although in 1820 a sum of 5,354,101 francs had been already spent, it was only under Louis Philippe that the work was again taken up and at last finished, in 1842, at the cost of 9,874,480 francs.

It is generally believed that the members of the Commune were the sole destroyers of the palace; but a rumour circulated after the fall of the second Empire, accusing the partisans of Napoleon III. with the crime of destroying the building, or with having excited the infuriated mob to do so, the Emperor and his principal ministers having good reasons of their own to wish for the total disappearance of some secret State papers, too well conserved there. This is the way in which the good republicans and the enemies of the Empire tell the story of the fire, but the true facts are, that Eudes, one of the generals of the Commune, and Megy, together with a few other leaders of the Revolution, decided that the building should be searched and the Imperial documents brought to light. So they arrived one morning at the gates, and forced Mr. Noel, the governor of the palace, to give up the keys of the private rooms entrusted to his care. They were, however, disappointed, and found only

"My high opinion of 'SPECIFICATION.'"

a few certificates of deaths, births, and marriages in the Imperial family, and some autograph letters of Napoleon I. The believers in the rumour explain this, by saying that Mr. Noel had foreseen the possibility of a search, and had hidden any compromising documents which he had under his charge. He remained there unmolested till May 2nd, when the military chiefs of the Revolution, seeing that resistance was impossible, and that the troops sent by Thiers from Versailles would soon be within the walls of Paris, decided to destroy the principal monuments of the Capital and leave behind them nothing but ruin and destruction. The reason of this determination is not easy for any Englishman to understand; perhaps the leaders of the Commune did understand it, but it is doubtful whether there was any other excuse, except the love of wanton destruction, so dear to the hearts of the French mobs. Nôtre Dame escaped almost by a miracle, as did the Louvre, but the Cour des Comptes burned with the Tuilleries, the Hôtel de Ville, and all the private houses of the aristocracy around them. The palace of the Légion d'Honneur was saved owing to the extreme courage of two men, who, at the risk of their lives, entered the building, already partly in flames, and rolled away the barrel of powder put there by their friends. From the Palais Royal to the Champ de Mars there was nothing to be seen but a huge blaze surrounded by a joyous mob of lawless men and women, who were only prevented from committing further excesses by the timely arrival of the troops.

No one knows the names of the men who forced the gates of the Cour des Comptes and followed Mr. Noel through the rooms and the galleries, covering him with their guns, till he was forced to leave his post of honour. Then they proceeded to smear the walls with petroleum; a barrel of powder was brought into the Great Hall, and at a given signal, blown upon a clarion, the building was set fire to and the secrets of State destroyed.

Paris did not lose a marvel of architecture, it is true; the Palace was a hopeless mixture of styles; the exterior was far from beautiful, and the interior decorations were heavy and without any character. The rooms in which, for a time, the Council of State was held, was always said to be the most striking, but the Parisians who remember the huge building say frankly that it never was so beautiful and so picturesque before it had been gutted by the explosion of 1871. The principal frontage was on the Rue de Lille, though the best known was that on the Quai d'Orsay; both were somewhat alike, and showed evident proofs of their having been built by more than one architect, and under more than one government. The columns of the *rez-de-chaussée*, which were raised about 7ft. above the ground, were of the Doric order; those of the first floor were Ionic; the ornaments of the top were pure Renaissance; and the whole to the lover of classical harmony was a simple cacophony. The entire length of the building was pierced by nineteen arches, forming both on the side of the Quai d'Orsay and the Rue de Lille, and round the large Cour d'Honneur, open loggias on the ground and first floor, giving to the building a breadth of light and shade which made it striking. In the interior of the Palace were three Cours d'Honneur, giving access to the different halls and state rooms, most of them decorated with panels of various merit. The best ones were those of the grand staircase (the work of Theodore Chassériau) which were not completely destroyed. The groups personifying Silence, Meditation, Study, War, Force—the last one being a masterpiece—consisted mostly of female figures skilfully treated.

As long as the question of the reparation of the Palace was pending, the pictures were left covered with linen and thick layers of brown paper; last year they were brought to light and found to be in a fairly good state of preservation. They are going to be removed to the Louvre galleries. In the Salle des Séances some mural decorations by Gendron, representing the hours and the principal events of human life, have been very much spoiled. Some photographers have endeavoured to reproduce a few panels that are to be kept in the National Library.

For some years before its final destruction no one except the workmen and one or two privileged artists were allowed in the ruins, on account of the increasing danger caused by the constant falling of bits of walls and half detached stones, treacherously hidden under creepers of all sorts, for during the twenty-seven years which had passed since the fire, the Palace had been left untouched, and a most copious growth of vegetation had sprung up. Mr. Vallon, the well-known botanist, counts no less than 152 kinds of plants, amongst which all sorts of animals, birds, and reptiles live. For many years a large flight of rooks built their nests in the ruins, but, together with the other noisy tenants, they have been frightened away by the gang of workmen who came every morning with picks and axes to destroy their homes. And soon a modern building, which, let us hope, will be erected with enough taste not to spoil the fine view along the shore of the Seine, will stand on the spot which was once occupied by the ruins of the Cour des Comptes.

UNDERGROUND MINES AT THE PARIS EXHIBITION.

By A. ANDERSON.

ONE of the features that will certainly attract a very large proportion of the visitors to the Paris Exhibition next year will be the series of underground mines that are to be shown in full working order, and under conditions so ultra-realistic that the spectator's illusion will be complete. Such an enterprise would never have been possible, or, at any rate, would never have been seriously entertained, had it not been that the most costly part of the work, namely, the site, was prepared more than two centuries ago, long before international exhibitions had ever been heard of.

As many people are aware, the greater part of the city of Paris was originally constructed of stone, quarried from the strata directly underlying the soil, the practice being commenced by the Romans. The seams of stone being followed up wherever they led and as long as they lasted, a very considerable depth beneath the surface was attained in many places, the ramifications of the various galleries extending in all directions. As a consequence, the Paris of to-day is almost completely undermined, the continuity of the galleries being only broken by the bed of the Seine. Were it not for this, it would be possible to pass practically from one side of the city to the other without once being compelled to come to the surface.

Many projects have been at various times mooted for making use of these excavations, but something has usually interfered with their being carried into practical effect. In the earlier half of the present century, when the old cemeteries within the precints of the city were appropriated to other purposes, the question presented itself, what was to be done with the bones that were found in the soil? It was eventually decided by the municipal authorities to place them in a portion of the old quarries. This was the origin of the so-called catacombs of Paris, well known for many years past as a popular place of pilgrimage for the tourist. With this exception the miles and miles of wide galleries may be said to have never been utilised, not, at any rate, for any legitimate purpose! The approach of the Exhibition, however, once more brought the subject on the *tapis*. It so happens that the gardens that slope down to the river from the Trocadero cover one of the most important series of quarries, or rather mines, of former days. Moreover, the Trocadero gardens form part of the area that is included within the area of next year's Exhibition grounds. This double fact was taken advantage of by the Associated Coalfields of France to elaborate a project for utilising the quarries by installing a series of mines in them. The necessary permission having been granted, M. Gruner, the secretary of the Associated Coalfields, had operations started some time ago. A shaft about 50ft. deep has been sunk, and the portions of the galleries which it is proposed to utilise are being widened and heightened to about 8ft. The works involve considerable labour, as the use of blasting powder is absolutely prohibited, principally for fear of damaging the huge superincumbent structure of the Trocadero, the foundations of which come right down into the galleries. The workmen have also come across other foundations which were intended to be those of a palace that was to have been constructed for the King of Rome at the beginning of the present century, but which was never carried to a conclusion.

The original excavators of the stone had left at intervals large square columns, untouched by the pick, to serve as supports for the rock and soil above. These are now being demolished and replaced by solidly constructed masonry. In the galleries thus enlarged, mining operations of all kinds will be shown—coal, lead, the precious metals, salt, diamonds, copper, &c.—the substances being actually mined under the eyes of the visitors by real miners, employing all the most modern tools. In another separate section of the galleries, access to which will be gained by an inclined plane instead of by a perpendicular shaft, a series of archæological reproductions are being arranged, including a mine in the time of the Phœnicians, the tomb of Agamemnon as discovered by Schliemann, a necropolis of Lower Egypt, and various other similarly interesting sights. All the galleries, both in this section and in that of the mines, will be lighted, of course, by electricity.

The construction of the surface buildings presented no little difficulty. On the one hand it was necessary to have a structure that would be conspicuous from a distance, and on the other hand it was intimated that no plans would be passed by the exhibition committee that would in any way hide or even jar with the architecture of the Trocadero Palace behind, as it is intended that this is to play a very prominent part in the festivities and fêtes of next year. M. Beigbeder, the engineer, who has charge of the works, and under whose direction everything is being carried out, had thus, of course, his hands tied in advance, and was obliged in consequence to curtail his architectural ambition. The surface buildings of a mine are not as a rule the most æsthetic-looking structures in the world, and M. Beigbeder seems, under the circumstances, to have extricated himself with a good deal of dexterity from the toils of the problem he was asked to solve. The façade of the building, thanks to the lightly constructed extraction tower that dominates it, is relieved of all heaviness of aspect, and, judging by the plans, should, when completed, prove a by no means undesirable addition, from an architectural point of veiw, to the Trocadero Gardens. Were it not for the very great slope of the gardens, M. Beigbeder would of course have been still further hampered in the matter of height. The total depth of the building is forty-five metres, or nearly 150ft., and the width seventeen metres (about 56ft.). The shaft by which visitors will descend is situated at the end of the building, and has an interior diameter of about 15ft., sufficient to permit the employment of lifts capable of carrying a very large number of people at each journey. The frontage of the building is most elaborately decorated with multi-coloured marbles and enamelled cabochons, a somewhat florid style, being not only acceptable but almost necessary in periods of popular exhibitions.

English Advertisements in the Paris Exhibition Catalogue are in the hands of Mr. C. Wilkes, of 29, Ludgate Hill, London, E.C., who has been appointed general manager and sole agent for the British Empire (except Canada) for this section. He is also the sole agent for the French and English guides and other publications issued by Messrs. Lemercier and Co., the Exhibition printers.

For other opinions see inset in this number.

Keystones.

Mr. W. H. Trood, the painter of animals, has died at Taunton from pneumonia.

An Admiral Blake Statue for Bridgewater is now in the hands of Mr. Pomeroy at Chelsea.

New Baths for Birmingham.—It is proposed to build baths in Green Lanes, Small Heath, at a cost of £30,000.

London's Three National Art Galleries will now be closed on Sundays for some months to come. The museums will remain open.

Notice of Removal.—Mr. Herbert Quinton, architect and surveyor, 15, Magdalen Street, Oxford, has removed to 22, George Street, Oxford.

The Society of Arts commences its 146th session on the 15th inst. with an address from the Chairman of the Council, Sir John Wolfe Barry.

New Organ at Cardiff.—A new organ has been placed in St. Catherine's Church, Canton. Messrs. Harrison and Harris, of Durham, were the builders.

Sites for New London Board Schools are to be purchased in Chelsea, Finsbury, Greenwich, Hackney, Lambeth, Marylebone, and Tower Hamlets.

A Morley Memorial Model School has been opened at Homerton to commemorate the lifework of the late Mr. Samuel Morley. It accommodates 240 children.

The Arts and Crafts Exhibition will now be open on Monday evenings up to eight o'clock; after half-past five the price of admission will be reduced to 6d.

The Glasgow Art Club Exhibition was opened on Saturday, and will remain open until December 9th. There are 252 works exhibited, including three pieces of sculpture.

A New Association.—At a meeting held in the Leeds Technical School on Saturday, the West Riding Association of Teachers of Science, Art, and Technology was constituted.

New Chapter House for St. Ninian's Cathedral.—On November 2nd the foundation stone was laid of the new Chapter House in connection with St. Ninian's Cathedral, Perth.

The Guildhall, Winsford, Cheshire, was opened on Saturday by Sir John Brunner, M.P., who bears the cost—£3,000. It is for the use of trade union societies and other organisations.

The Winter Art Exhibition at Bristol includes some important Belgian works. A better and more comprehensive selection of modern pictures has never been exhibited in Bristol before.

Mr. Ernest Runtz, architect, of 10, Walbrook, is preparing plans for the new Gaiety Theatre and Restaurant, and also for Messrs. Short's wine stores, that are to be erected in the new street from the Strand to Holborn.

A New Mission Church at South Tottenham has been erected at a cost of £3,000. It is 104ft. long by 34ft. wide, with nave, choir, and sacrarium, and has seating accommodation for 350 persons. A parish room and two vestries are also provided. Externally, the church is built of red brick, with Portland stone dressings.

Mr. Gladstone's Manchester Statue will be unveiled in the centre of the open space at the junction of Victoria Street and Market Street towards the close of next year. The artist, Signor Raggi, is completing the plaster cast, and in a few weeks it will be sent to the foundry of Messrs. Signer and Sons, Frome, who will cast the statue in bronze.

Another Gladstone Statue.—A statue to the late Mr. Gladstone was unveiled at Blackburn by the Earl of Aberdeen on Saturday. It has been erected at a cost of £1,800, gathered by public subscription, weighs about four tons, stands 10ft. high, and is the work of Mr. John Adams-Acton. The attitude of the figure is with hand upraised as if about to speak.

The Edinburgh Building Trades' Exchange pay a dividend of 6 per cent this year.

New Municipal Gasworks at Vienna, just opened, have been built at a cost of £3,500,000.

A New Church at Deganwy, Llandudno, has been built by Messrs. S. Parry and Sons, of Llandudno, from designs by Mr. Douglas, of Chester.

New Technical Schools at Stoke-on-Trent have been built at a cost of £3,181. The scheme includes the extension of the public baths.

Farncombe Street Board School, Bermondsey, S.E., is one of the oldest schools erected by the London School Board. New halls have recently been added.

Redditch Technical Schools. — The foundation stone of this building was laid on November 1st. Mr. H. R. Lloyd is the architect, and Mr. G. Huxley the builder.

A Municipal Crematorium at Hull is now being built at the Headon Road Cemetery, at an estimated cost of £3,168. This is the first municipal crematorium in England.

A Nurses' Home at Newcastle, in connection with the Fleming Memorial Hospital for Sick Children, has been built from designs by Messrs. Oliver, Leeson and Ward, of Newcastle.

The New University of London Hall for the science of political economy, a site for which has been provided in the new street being formed by the London County Council in Clare Market, Strand, is to be commenced at once. Mr. Maurice B. Adams, F.R.I.B.A., is the architect, and Mr. Passmore Edwards has contributed £10,000 towards the cost of the work.

New Lunatic Asylum for Aberdeen.—At a meeting of the Aberdeen City and District Lunacy Board on Thursday, it was reported that the Sites and Buildings Committee had purchased the estates of Kingseat and Rainnieshill, measuring altogether about 1,500 acres, and costing about £34,000, for the purpose of a new lunatic asylum. The committee were authorised to obtain plans for the building, and to accept tenders.

Barry, Barry Dock, or Cadoxton?—At a recent meeting of the Public Works Committee of the Barry District Council a letter was read from the Ordnance Survey Department, asking the Council to decide upon the name of the town. At present it was called either Barry, Barry Dock, Cadoxton, or Barry Island. It was unanimously agreed that as the whole of the parishes in the town had been unified under the name of Barry, the town itself should be called after that name.

The Artists' Guild.—The Queen will send the following loans from the Royal collection at Windsor to the eleventh exhibition of the Artists' Guild:—(1) Contemporary drawing of Queen Elizabeth; (2) workbox given by King Charles I. to the ladies of Little Gidding; (3) coloured prints on satin of George III. and Queen Charlotte; (4) five portraits on silver by C. de Passe. The exhibition will be opened on Tuesday, November 14th, at three o'clock, at the Royal Albert Hall, by Princess Christian, and will remain open the three following days.

A Million for Workmen's Dwellings.—At a recent meeting of the St. Pancras Vestry Mr. J. Thornley, J.P., had a resolution on the agenda paper for providing industrial dwellings in the parish, for which he proposed that a million sterling should be borrowed at 2½ per cent., equal to the erection of thirty five-storey blocks collectively accommodating 15,000 persons. At a rental of 2s. for each room he anticipated a yearly income of £39,000 to meet an expenditure of £38,000 in repayment of the loan. The Vestry acquiesced to Mr. Thornley's request that he should defer his motion to a subsequent occasion, meanwhile supplying each member with a printed explanation of his scheme, which he held to be practicable and desirable, on commercial as well as on sanitary lines.

Public Baths at Stourbridge.—It has been decided to erect public baths at Stourbridge at an estimated cost of £4,500. Mr. F. Woodward, surveyor, has prepared plans.

A Bronze Statue of Admiral Raphael Semmes, the commander of the famous "Alabama," has just been cast in America. The late Mr. Caspar Buberl, of New York. executed the work.

The Karnak Columns, which fell a short time ago on account of a slight shock of earthquake, caused damage which is estimated to cost £50,000 to repair; this amount includes the strengthening of the temple.

Old St. James's Church, Leicester, a wooden building built in 1881, is to be replaced by a new structure designed by Messrs. Goddard and Co., at an estimated cost of £10,000. The chancel and part of the nave are to be built first, at a cost of £7,856.

A New Four-light Stained Glass Window has been placed in the west end of Holy Trinity Church, Smethwick, Birmingham, in memory of the late vicar, the Rev. Thomas Ridsdel. The subject of the window is "Christ Blessing Little Children." The work is from the studios of Mr. Arthur J. Dix, 54, Berners Street, London, W.

Result of Competition.—The successful competitors for the new Masonic Hall that is to be erected in Great George Street, Leeds, are:—First, Mr. J. M. Bottomley, Middlesborough and Leeds; second, Mr. Clarence Coggin, Adelphi, London; and third, Mr. A. E. McKewan, Newhall Street, Birmingham. The assessor was Mr. J. Lane Fox, of Dewsbury.

The High Altar Screen at St. Albans Abbey has been restored at a cost of about £15,000 by Messrs. Hems, of Exeter, who were under the direction of the late Sir Arthur Blomfield. The screen itself is 42ft. high and 39ft. wide, extending from the north to the south side of the sanctuary. It is built entirely of clunch, a finely grained, white stone obtained from the quarries of Totternhoe, in Herts. The most striking feature of the screen is the great central statue representing the Crucified Christ, which is 8ft. 6in. high. An illustration of the torso appeared in the BUILDERS' JOURNAL for February 8th last.

The Czar's House in Paris. — The Emperor of Russia is not sure whether he and the Empress can attend the 1900 Exhibition, but if they do, they will be under their own roof. It is stated that an agent of the Emperor has purchased for him the oddly-planned house in the Champs Elysées, which Cubas turned for some time into a restaurant. It was built by the notorious Madame de Paiva, who wound up a stormy life by marrying a vastly rich nobleman of Silesia. The French Government has decided not to provide lodgings as well as entertainment for any of the Sovereigns coming to the exhibition. The plan, dear to the late Felix Faure, of a Guests' Palace thus falls to the ground.

Sanitary Inspectors' Association. — A meeting of the Sanitary Inspectors' Association was held on Saturday evening at the Carpenters' Hall, London Wall, to hear the inaugural address of the Chairman of the Council, Mr. W. H. Grigg, Inspector under the Food and Drugs Act for Fulham. In his address Mr. Grigg congratulated the association on the remarkable favour with which the Qualification and Tenure of Office Bill, which it had decided to submit to Parliament, had met, a success which had far exceeded his most sanguine expectations. One of the most important benefits bestowed on sanitary inspectors, should the Bill be carried through, would be that whereas at present an inspector might be dismissed at the will of local bodies, after the Bill was passed no sanitary inspector could be dismissed by any local body without the sanction of the Local Government Board. It was proposed to introduce the Bill into Parliament immediately on the reassembling of the House. Another matter for consideration was the urgent necessity of promoting the amalgamation of the Sanitary Inspectors' Associations throughout the country in order to present a united front to their enemies.

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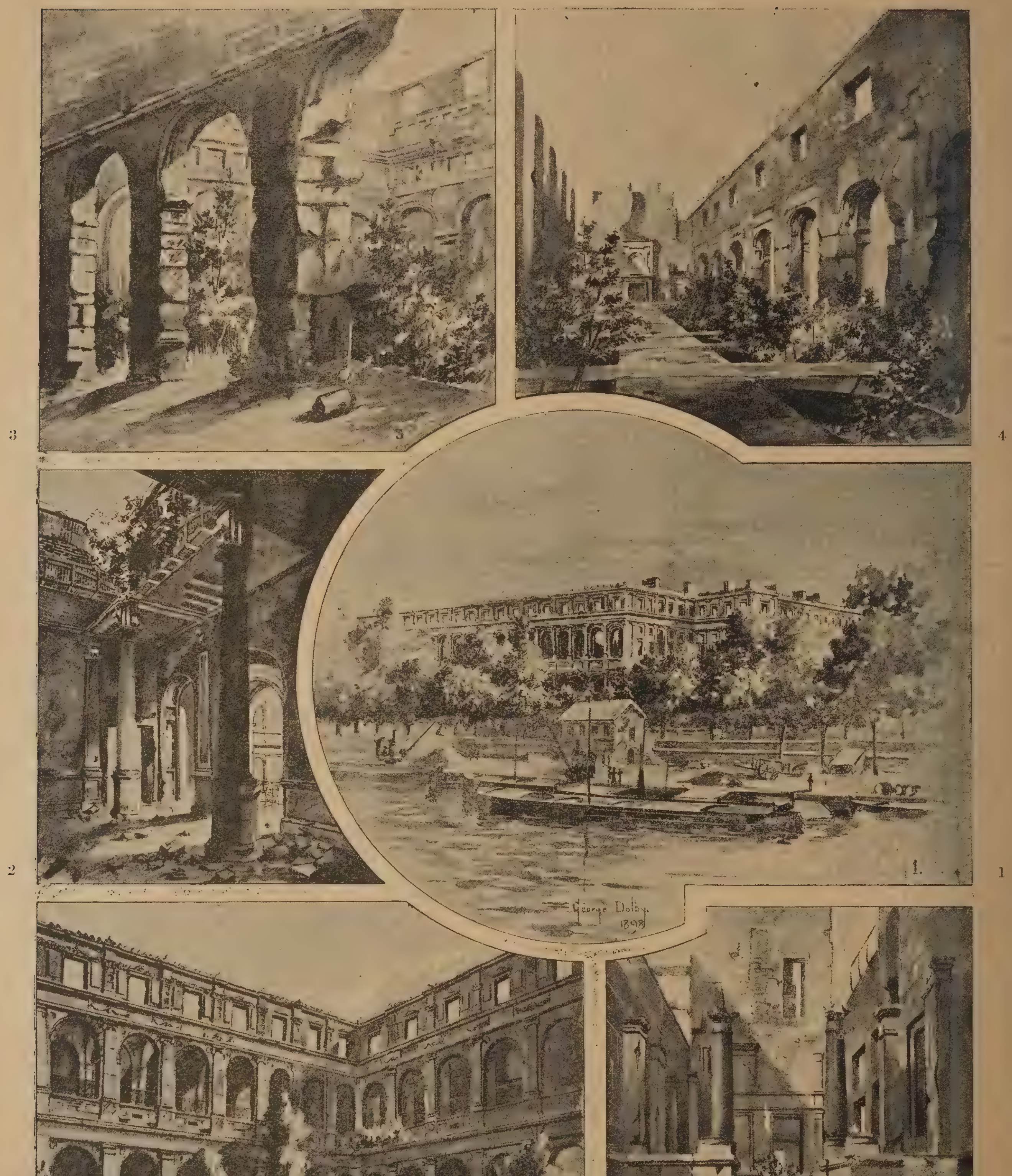
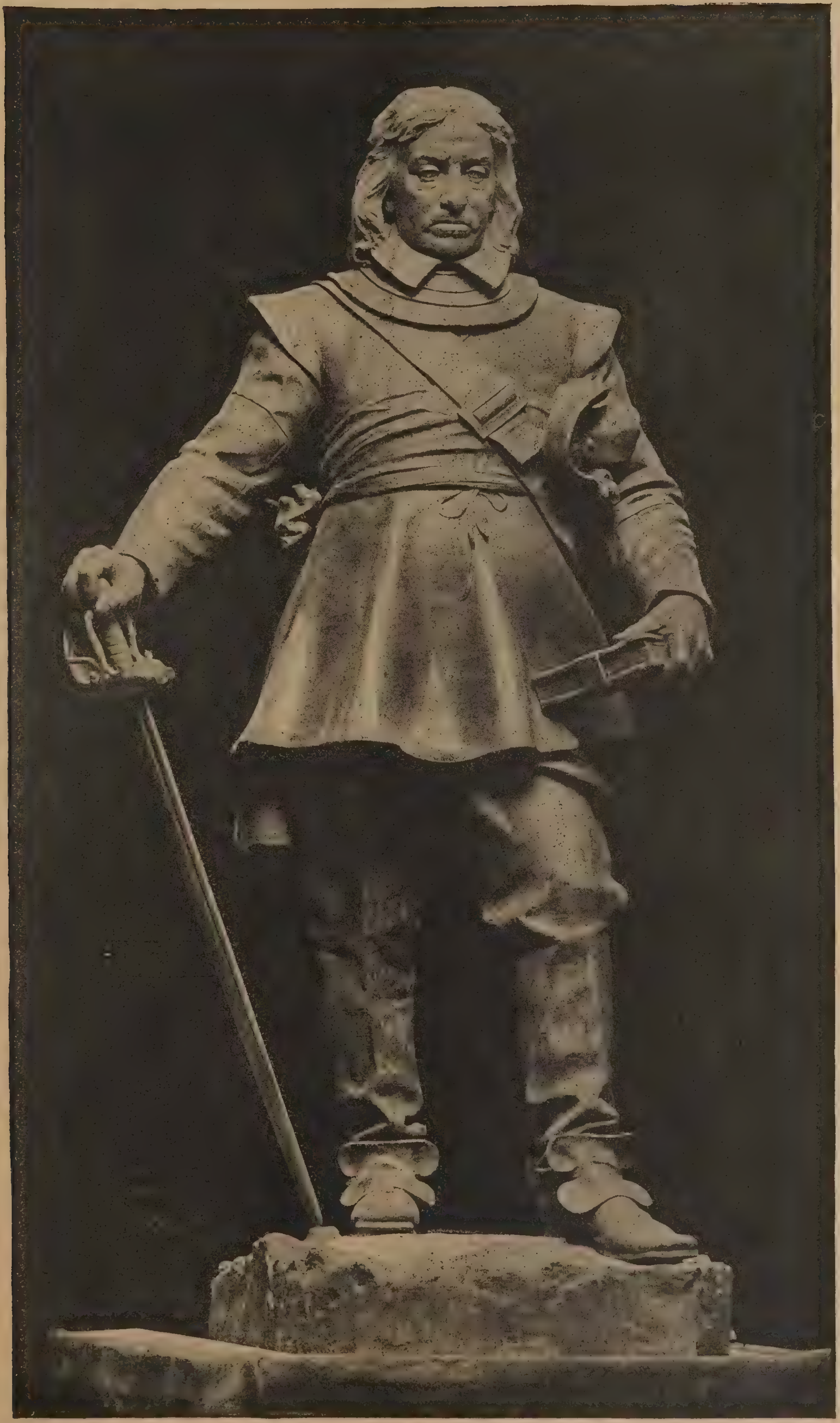


(1) General View from the River. (2) Vestibule—Ground Floor. (3) Gallery above same—First Floor. (4) Council Chamber—First Floor. (5) Corner of "Cour d'Honneur." (6) Staircase and Passage, Rue de Lille Façade—First Floor.

PALACE OF THE COUR DES COMPTES, PARIS. Drawn by George C. D'Albi. (*See page* 210.)



THE STATUE TO OLIVER CROMWELL, TO BE UNVEILED AT WESTMINSTER NEXT WEEK.
W. Hamo Thornycroft, R.A., Sculptor.

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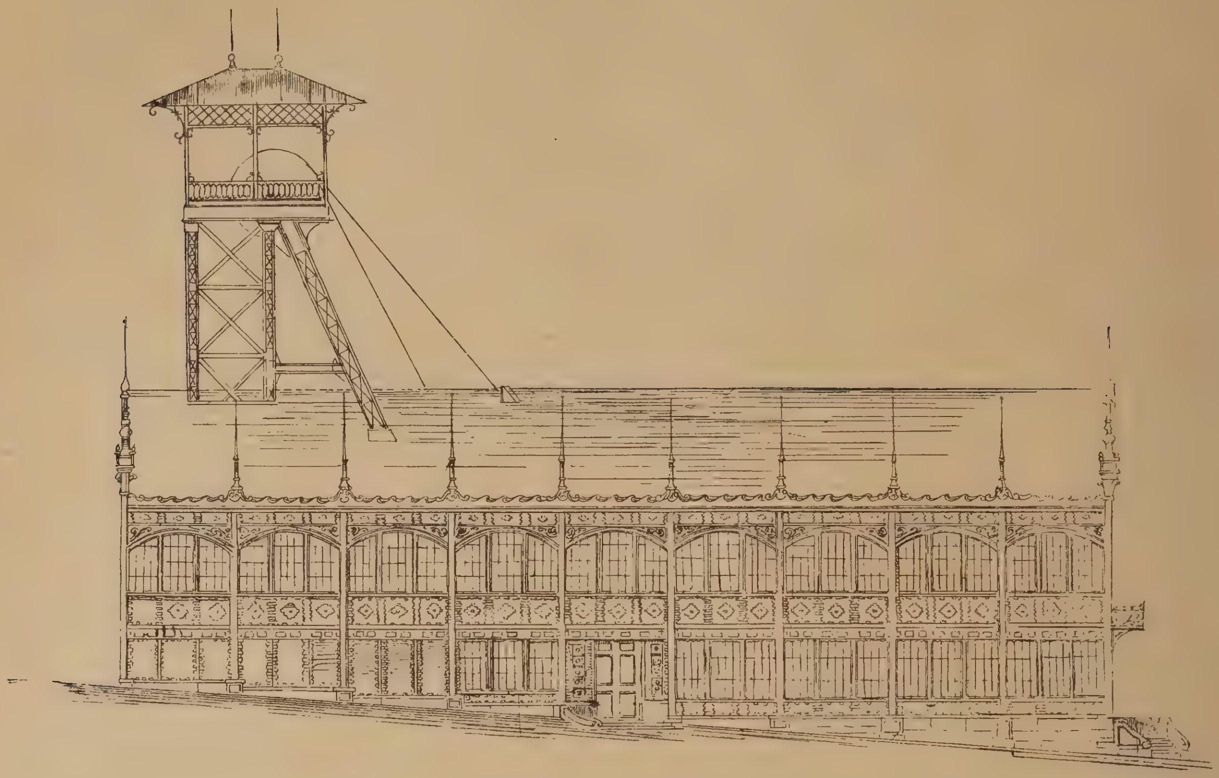
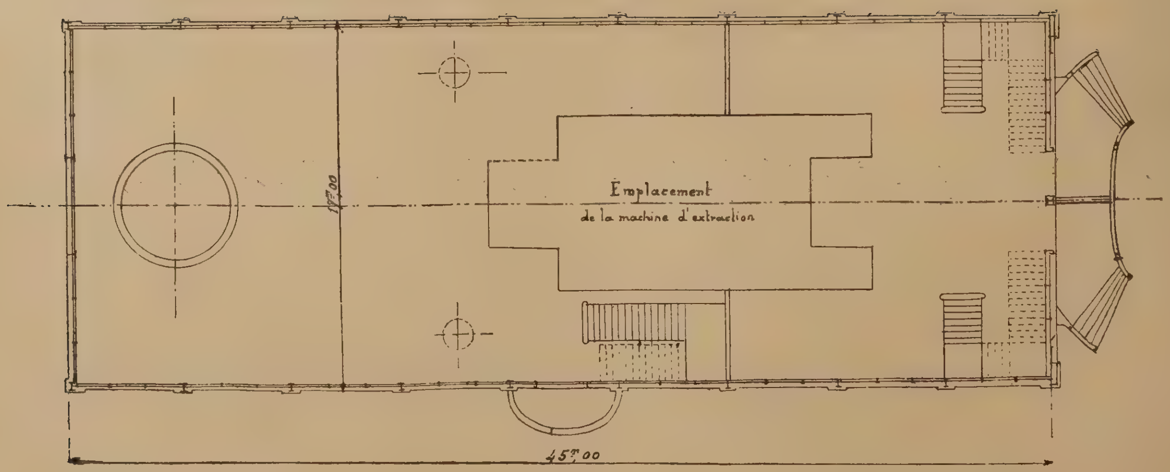
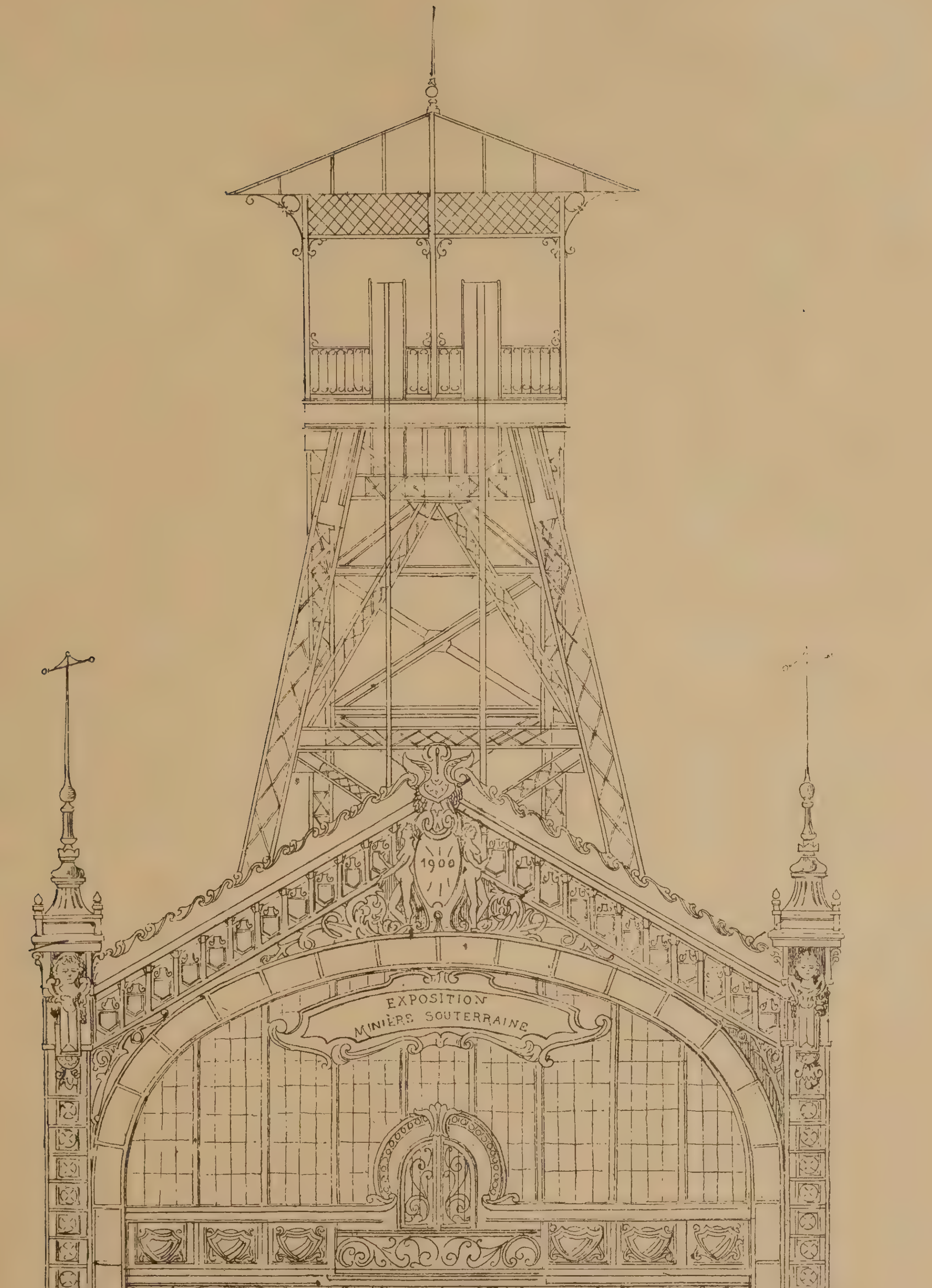


Longitudinal Façade.



Plan.

BUILDINGS IN THE RUE DE MAGDEBOURG IN CONNECTION W



Principal Façade.

THE UNDERGROUND MINES AT THE PARIS EXHIBITION OF 1900.

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R.I.B.A.

PRESIDENT'S ADDRESS.

THE inaugural sessional meeting of the Royal Institute of British Architects was held on Monday evening last at 9, Conduit Street, W., when Mr. William Emerson, the president, occupied the chair. His first duty, he said, was to announce the regretable death of Sir Arthur Blomfield. It was only a week previously that he had received a letter from Sir Arthur, in which he intimated his intention to be present at this meeting. The chairman mentioned what an ardent admirer of the old Gothic school of Architecture their deceased friend was, and said that in his works, as in his life, there was a strong element of self-restraint; they were full of quiet refinement, and were totally devoid of any form of affectation. He said it was proposed to hold at the Institute an exhibition of Sir Arthur's chief works, and he referred to the simplicity, stately dignity, and proportion of Christ Church, St. Leonards, and of the nave at St. Saviour's, Southwark (a description of the latter is given in another column). Sir Arthur Blomfield had been vice-president of the Institute from 1886 to 1889, and could have ccupied the position of president years ago had the time at his disposal allowed him to do so. He was the stamp of man produced by the old school of architecture which had now died out, and his death was a great loss both to the architectural profession generally and to the Institute. The secretary then read a translation of a letter received from M. Charles Lucas, of Paris, an honorary corresponding member of the Institute, in which admiration was expressed for the influence of Sir Arthur Blomfield, who was by everyone referred to as a thorough gentleman. It was agreed that a vote of condolence and sympathy should be sent to his wife and family.

The deaths were then announced of Mr. Thomas Elworthy, elected Fellow in 1884, and of Mr. Henry Hockey Burnell, elected Associate in 1849. The Chairman then moved that a vote of sympathy should be sent to the family of Mr. William Simpson, who had died on August 21st, and had been an old member of the Institute as an honorary associate; he was a famous Indian archæologist, and had acted as war correspondent to the "Illustrated London News." For the statutory examination held on October 26th and 27th two candidates had presented themselves, and of these Mr. C. A. Daubrey, of 1, Wellington Road, Peckham, S.E., had been granted a certificate of competency to act as district surveyor in London.

After the secretary had read the names of candidates nominated for election at the business meeting to be held on Monday, December 4th, the president delivered his opening address as follows:—

The coming session, for which I have the honour of occupying this chair, is the sixty-fifth in the annals of the Royal Institute of British Architects. It is also the last ession of the nineteenth century. In glancng at the doings of the Institute since its foundation in 1834, the thing I most keenly feel in this particular position is the exceeding difficulty and responsibility of continuing and worthily upholding the character and dignity of the work that has been achieved by my predecessors in office. I think the list of members of the Institute points to considerable and satisactory progress in its affairs since its inception. n 1837 we had ninety-six Fellows and Associates, of whom fifteen only were country members. In 1887 we had 1109 members, of hom 259 Fellows and 435 Associates were om the Metropolis, and 169 Fellows and 246 Associates from the Provinces. In 1899 since the federation of the country societies with ur London body—and this is a fact I wish to mphasize—our number has increased to 1612, f whom 290 only are Fellows from the Metropolis, while 328 are from the Provinces, and 52 London Associates, and 442 from the ountry. The number of societies in alliance ith us in England, Scotland and Ireland, and he Colonies is seventeen. These figures show that the old reproach of this Institute being merely metropolitan can no longer be cast at us, but that it has now attained a national character and influence, as much appreciated by the members of the profession in the country as in London. The work also of the Institute is increasing each year in importance, making its opinions heard and felt in respect of many important public questions relating to architecture. The conservation of our national monuments, building projects both for the Metropolis and Provinces, the laying out of new streets and town improvements, legislative acts in relation to building operations, the representation of our Institute on many public bodies and committees where questions affecting architecture or buildings may arise, the conduct of competitions, the promotion of the education of architects by annual examinations, the presentation of annual prizes and medals, are some few of the subjects constantly dealt with by the Institute.

The Influence of the Institute.

Moreover, the Government at times does not hesitate to consult us on questions connected with public works. All these are fair proofs that the sixty-five years of our existence as a Royal Society have not been altogether wasted from a public and national point of view, apart from matters more immediately connected with the interests of the profession at large, and the future of architectural development. And the extending influence of the Royal Institute of British Architects seems in no danger of languishing—if one may judge by the vivid interest taken in its working and actions by the junior members, who desire more voice in its affairs. In respect to this point I may say the Council had under deliberation at the end of last session what steps could be taken under the Charter to associate them more directly with the work of the Council. Amongst other things it was decided to remove all restrictions as to the eligibility of Associates for seats on the Council. Also, with a view to extending our sphere of influence, a congress will probably be held in London this session, and in Glasgow in 1901, at the time of the Exhibition. At certain periods in the lives of individuals it seems fit to review, with a critical eye, the actions of their past lives. So at the wane of a century notable for its progress in knowledge, culture, and civilisation, it may be opportune for us, as architects, to glance back and see if any advance has been made in our art (which the Charter asserts is esteemed and encouraged by all enlightened nations), and whether our efforts have been conducive to the benefit of mankind and the glory of our country through the part the Institute has played during the last sixty-five years in the furtherance of our national interests so far as they are affected by Architecture. There are several reasons why during this century great architectural developments might reasonably have been expected. It has, on the whole, been eminently peaceful and prosperous, which fact one would think should certainly affect all arts favourably; for rest, quiet, and prosperity seem essential to their growth. This peace and prosperity were brought about by the exhausted state of Europe at the cessation of the wars of the last century and the early years of this; by scientific inventions which developed our Empire, manufactures and commerce; and in later years by the wealth and naval supremacy of Great Britain, the knowledge of the awful effects of modern warfare, and the growth of civilisation and humanitarian sentiments. At the close of the eighteenth century and the beginning of the nineteenth, Europe had passed through a crisis unparalleled in its character and effects in history. The Seven Years' war, the wars of American Independence, and the Napoleonic wars ending in 1815 had raised our National Debt to some £900,000,000 sterling. Taxation was heavy, commerce stagnant, and there was little demand for labour. Our impoverished and tired country was eager for peace and only too glad to turn its attention to home politics and peaceful pursuits. Then the experiences of the French Revolution taught England lessons which resulted in provisions for the more direct representation of all classes of people in the government of the country, and the Commons became the people's House of Parliament. The more direct representation of the people tended to the furtherance of utilitarian and humanitarian projects. The humanitarian feeling of the age for the poorer classes was shown by the abolition of the slave trade. This feeling found further expression in such measures as the formation of new poor laws, factory legislation, school boards, prison laws, asylum boards, national training schools of Art, railway bills, building acts, and county councils. All these have in many ways provided opportunities for architects and largely affected Architecture. But in most buildings for humanitarian purposes

Architecture has been Hampered

by the many necessary laws relating to sanitary matters, such as the relation of light area to rooms, superficial floor space and cubic air space, heating, ventilation, and drainage. Whether Architecture as an art has been improved by these conditions is questionable. From the utilitarian standpoint, Committees and Boards seem universally to affect Architecture in an adverse manner; in fact æstheticism and utilitarianism appear to be always antagonistic. But surely a properly educated body of architects should be able to reconcile the two. As well as from peace and the peaceful politics of the century, an advance in Architecture might reasonably have been looked for from the influence of the increase of knowledge, our modern facilities of travel, the scientific discoveries and inventions, resulting in an enormous influx of wealth; also from archæological research, and the desire for culture, from literary and artistic productions in books, journals and publications which have educated the taste of the public and also influenced that of architects. Looking at past history, Art seems to have acquired fresh vigour and life and made greatest strides at

Periods of Learning and Culture

during years of independence and peace succeeding great wars or troublous times. These latter have often lent inspiration afterwards to architects and sculptors for the adornment of buildings, and given a living interest to their work. The comparative quiet of the fifteenth century, after the turbulent feudal ages, saw the rise of the Italian Renaissance. So, also, when the Western world settled down after the invasion of the Goths, they developed the best periods of Gothic architecture under the influence and teaching of the Holy Catholic Church. It was in the quieter years succeeding two centuries of continuous Mahomedan conquests that the stately and magnificent Architecture in Africa, Spain, and the East developed itself. After the Persian sway had been destroyed at Thermopylæ and Platea, the Parthenon and the best Greek art were produced. So, too, at Rome the finest works of the Empire were created during the period of comparative calm and prosperity that followed the subjugation of Greece. Some critics decry our present architecture, and say it often shows little taste and no advance in Art or style. But they should recollect that

The Highest Level of the Arts

of any of the periods above mentioned was not arrived at in a day, nor did their architecture leap to perfection in a decade, and certainly Architecture then could scarcely have had to fulfil the complicated requirements which make modern architectural problems so difficult. The Parthenon was erected over half a century after Platea. The best of Roman architecture was not evolved till long after the battle of Actium; nor did the best phases of Gothic architecture appear until after many centuries of patient endeavour. Also more than two centuries succeeded the rise of Mahomedanism before its literature and scientific knowledge developed, or its architecture resulted in the Mosque of Toloun; and many more passed before the erection of the tombs of the Caliphs, and before the elaborate refinements of the Alhambra and the perfect beauty of the Taj Mahal were arrived at.

(To be concluded.)

Correspondence.

LEEDS MASONIC HALL COMPETITION.

To the Editor of The Builders' Journal.

London, E.C.

Sir,—What an unnecessary and useless expense the promoters of the above competition have put themselves to! And, further (but, of course, *that* is of no consequence), what trouble and cost they have put many competing architects to, when all this trouble and expense might in the first instance have been saved! For the work has been given to an architect who, most singularly, happens to have offices in the same street in Leeds (Bond Street) as the offices of the Leeds Masonic Hall Company, Limited, are situated. What a happy ending to a competition, and how pleased we all ought to feel to know that local talent is, in this instance, thus rewarded!—Yours faithfully, H. T. B.

THE USES AND LIMITS OF PERSPECTIVE.

To the Editor of The Builders' Journal.

London, W.C.

Sir,—My last letter was not intended to be critical, and I am sorry Mr. Middleton and his friend received it as such. My object was to suggest further uses of perspective and to express an opinion on certain points raised in the leaderette. Referring to the reply to my last letter, I fail to see how a drawing in lead pencil can be (gaudy?); neither do I assume, as stated, that the selected competition design is chosen on account of its perspective. If two designs be equal in merit (in plans, elevation, and sections, &c.) and one has a perspective and the other has not, I maintain that the former invariably takes precedence. This would be quite fair, as usually the view is optional to all competitors. I admit that "artistic merit" is not strictly to the subject, but in this case I was expressing an opinion as to a point raised in the original leaderette. In regard to the point of view, I have already expressed my opinion (see Builders' Journal, October 25th last). I would remind Mr. Middleton again that the expression of one's opinion does not indicate misunderstanding.—Yours truly, C. HENZELL-ASCROFT.

A QUESTION OF PROFESSIONAL ETIQUETTE.

To the Editor of The Builders' Journal.

Edinburgh.

Sir,—We should like to have your readers' opinions on the action of one of the competitors for the Dundee and Forfar District Hospital.

Plans for an Isolation Hospital for twenty-four beds were publicly advertised for; the total cost, excluding furnishings, professional fees, &c., was to be £4,500. Any person who has experience of buildings designed on the pavilion system knows very well that such buildings as were asked could not be erected for anything like this sum. The assessor, who evidently was called in after the plans were received, stated the cost of the buildings, as detailed in the conditions of competition, at about £8,000, which was also the opinion of Mr. Anderson, C.E., the sanitary inspector of the district. The design submitted by us was placed first by Mr. Morham of Edinburgh, the assessor, and while we were negotiating with the committee, Mr. Cappon, F.R.I.B.A., Dundee, who took the third place in the competition, wrote to the committee and stated that he was prepared to issue schedules and take in estimates, and if the offers received for the whole works exceeded the sum stated by him as the cost of his buildings, namely, £5,400, he would not expect any remuneration for the trouble and expense he had been put to.

The committee agreed to this being done, and we have since received a communication from them that Mr. Cappon had been appointed architect, the gross amount of his offers having come out at about £3,000 less than our estimate, which was £8,000, and, with the proportion of cost for other works, £8,800; so that the gross amount of Mr. Cappon's offers for the work of a hospital containing twenty-four beds and including walling round seven acres of land is £5,800.

The sum stated in your journal a fortnight ago was nearly £7,000. If the former sum is correct, can the work be executed with "first-class materials and good workmanship" for this sum? If the latter sum is correct, it seems to us that the committee have scarcely done what is fair to ourselves. Mr. Cullen, Motherwell, who took second place in the competition, was asked by the committee to make a similar offer to that made by Mr. Cappon, but he declined, as he considered that the only fair way was to submit the plans to a measurer of experience.—Yours truly,

McARTHY and WATSON.

PLUMSTEAD COMPETITION.

MUNICIPAL BUILDINGS AND PUBLIC LIBRARY.

FORTY complete sets of designs have been submitted by architects in compliance with the invitation of the Plumstead Vestry. The proposed site is a large one, open upon three sides, the longest and most important having a frontage to Gossage Road, and the narrower frontages to Ancona Road and Park Road. The conditions require a public hall to to seat 1,000 persons, public library, comprising lending and reference libraries, news and magazine room on the ground floor, and museums with commissioner's room on the first floor, and librarian's quarters. The library is to be located on a space provided at the angle of Gossage and Ancona Roads. The municipal buildings comprise vestry hall, offices for vestry clerk and surveyor, medical offices, rates and electrical offices, and burial board, together with committee rooms.

Of the designs submitted generally it may be said they are of very unequal merit, neither do they display, with one or two exceptions, any marked ability, either as regards architectural treatment or skilful planning. The whole of the designs shown upon 255 drawings were on view to the general public daily last week in the Windsor Castle Hall, Maxey Road, Plumstead.

In the selected design, No. 3, the public hall is placed with its length parallel to Gossage Road at the rear of the site, with entrance from Park Road, and an emergency exit into the main corridor of the municipal buildings, which are entered from the centre of the Gossage Road front. Large ladies' and gentlemen's cloak rooms, with lavatories in the basement, adjoin the entrance from Park Road, while a crush room is provided, entered from a private road, 20ft. wide, at the back of the site. The sanitary inspectors and medical offices are located in a lower ground floor, with the entrance to the rates department at the angle of Gossage and Park Roads. There are male and female retiring rooms under the stage. The vestry clerk's offices are placed on the ground floor, with the surveyor's offices at the angle of Gossage and Park Roads. The council chamber or vestry hall is a square apartment on the first floor, with the gallery entrance adjoining the entrance to the public hall. The committee rooms are arranged *en suite* on the first floor of the Gossage Road frontage. The public library is entered from Gossage Road, the news and magazine room occupy the Ancona Road front, and the reference library is on the right of the entrance.

The elevations are treated with a rusticated order, and are proposed to be executed in brick, with stone dressings. The central feature of the long façade is a dome rising out of a square base, and the angles of the wings are emphasised by rusticated domical turrets. The grouping of the building, as shown by the refined perspective drawing, is skilful, and displays consistent balance of parts. By hiding the large public hall away at the rear, the authors avoid one of the great difficulties in the architectural composition of the building, which makes this design much less expressive than many others exhibited. The arrangement of the municipal offices upon three floors does not appear at first sight very convenient, although the authors provide accommodation for 1,000 persons on the floor of the hall without the use of galleries. The perspective drawing shows an entrance to balance the library entrance, which does not exist upon the plan or elevation, and the authors will certainly require some columns at the back of the public hall to carry the wall of the council chamber and caretaker's quarters.

No. 30, the second premiated design, places the hall at the side parallel with Park Road, the principal entrance being in Gossage Road. The long frontage is divided into three portions on the ground floor by arched entrances 20ft. wide, in which are placed the entrances to the various departments. The library plan is similar to that in the first premiated design. The council chamber is on the first floor, in the centre of the Gossage Road front. It is awkward in shape, and impossible as arranged. The whole plan appears to us complicated, and the elevations much less satisfactory than the selected design.

No. 22, the third premiated design, places the public hall at the side, with municipal offices in the centre. The library is also entered from Gossage Road. All the offices are on the ground floor, with the committee rooms on the first floor. The elevations are feeble and the grouping poor.

No. 16 has a good plan, and places the public hall at the side, with a crush room and the Works Committee room arranged as a supper-room, with provision for refreshments. The library is entered from Ancona Road, and the vestry hall is placed in the centre of Gossage Road and Ancona Road. The elevations are treated with a great deal of simplicity and breadth, the long front being relieved by towers which mark entrances below. The author sends a good wash perspective drawing. No. 33 is remarkable for the good design of the elevations below the cornice line. The public hall is placed in the centre with corridors upon either side. No. 36 shows the hall at the side, and No. 25 with it in the centre, as in No. 33. The elevations treated with a Corinthian order are unsatisfactory. Nos. 18 and 7 are chiefly remarkable for their good perspectives by the same hand as the perspective of the first premiated design. No. 19 places the hall at the rear with entrances from Gossage Road and Park Road. No. 2 puts the public hall at the rear, as in the first premiated design, but with an entrance from Gossage Road as well as from Park Road. The elevations are well designed, especially the centre of Gossage Road elevation. The drawings are made with great freedom. No. 8 has the hall in the centre end on to Gossage Road, with corridors on either side; the municipal buildings balance the library upon the other side. The library is entered from Ancona Road. The elevations are of brick and stone, boldly drawn, with a large tower at the angle of Gossage and Park Roads. A good perspective accompanies the design. Some of the other designs have points of interest, but many are distinctly below the average standard. Mr. Mountford was the assessor.

Up to the time of going to press the names of the authors of the premiated designs have not been announced. We are, however, informed on good authority that the first premium has been awarded to Mr. A. B. Thomas, 7, Queen Anne's Gate, S.W., and the second to Messrs. Hall, Cooper, and Davis, 21, Old Queen Street, Westminster, S.W.

A Municipal Lodging-House at Southampton provides accommodation for 186 single men at a capital outlay of about £11,000 for the building. The electric light is laid on, and baths are provided.

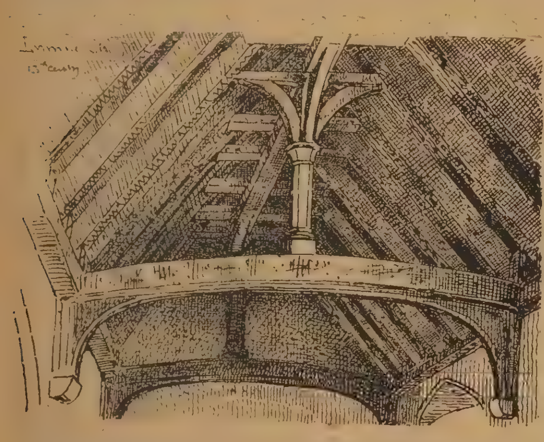
All Saints' Church, Lower Marsh, Lambeth, S.E., is to be demolished, in order to make room for the enlargement of Waterloo station. The church is only about fifty years old, and is not architecturally interesting.

Bricks and Mortar.

Aphorism for the Week.

"Works of true merit are seldom very popular in their own day; for knowledge is on the march, and men of genius are the "præslolatores" or "videttes" that are far advanced o their comrades. They are not with them, but before them; not in the camp, but beyond it."—C. C. Colton.

A Buried City. Many years ago excavations were made on the site of the Roman city Uriconium, which is about six miles out of Shrewsbury, and the valuable relics then discovered are now in the Shrewsbury Museum. The work was, however, brought to a premature conclusion through lack of funds and other causes, but the committees of the Shropshire Archæological Society and the Archæological Institute have now taken the matter in hand, and further excavations have been commenced. Similar work at Silchester had prevented researches at Uriconium being made by the Institute, so that it is pleasing to know the appeals of the Shropshire Archæological Society have borne fruit. Mr. St. John Hope, a member of the Institute, who has been engaged on the Silchester excavations, has commenced operations on a small scale on the south side of what is locally termed "the old wall," but which is, in fact, a part of the Basilica, a great building in the centre of the city. Adjoining this has been found the remains of another important building, which is believed to have been the Court House of the city, and several square feet of the tesselated flooring have been uncovered; but the centre, which was no doubt of handsome design, is missing. What has already been found is ample to justify the belief that there is still remaining under ground very much of interest that no eye has seen for nearly 1,500 years.



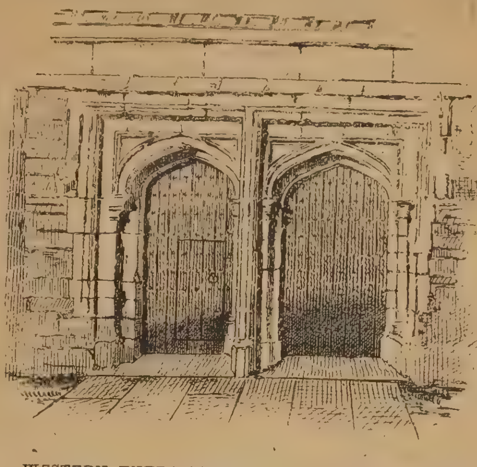
LYMNE CHURCH ROOF. SKETCHED BY JAMES WIER.

Glasgow Cathedral. "My impressions of Glasgow Cathedral" was the subject of a paper by Mr. A. Wagstaff, recently read before the members of the Glasgow and West of Scotland Technical College Architectural Craftsmen's Society. Mr. W. H. Baxter, the president, occupied the chair. Mr. Wagstaff, in proceeding with his subject, showed how by degrees the material form of the building might be made to lead every craftsman and artist to comprehend the ideas of Ruskin and many of the classics. He treated less of the architectural features, pure and simple, than the various evolutions which led to their own peculiar existence, and also remarked upon these buildings as being the height of art-excellence of a community and as such to be compared with similar structures of to-day, most unfavourably to the atter. He tried to draw a parallels between the decline of art and social and national affairs, nd gave it as his opinion that until architect and craftsman could work harmoniously and intelligently together, our art would never attain the standard it should. He showed many points about the cathedral which he considered deteriorating; for example, the heterogeneous collection of marble ornaments in the nave and the clumsy bench seating of the choir.

Sketches in Kent. On this page we illustrate three interesting sketches by Mr. James Weir, F.R.I.B.A., of 17, Victoria Street, Westminster, S.W. The western entrance to the fine old tower of St. Mildred's Church, at Tenterden, is situated about nine miles from Headcorn Station, near Ashford. This is the church which legendary lore credits with being the cause of the Goodwin Sands. The sketch of one of the gables of the fine old half-timbered house which stands on the road to Lyminge, a few miles from Folkestone, shows a somewhat unusual construction and a very fine old chimney. The roof of the old church over-looking the sea at Lymne, a few miles from either Folkestone or Hythe, is of about twelfth century date.

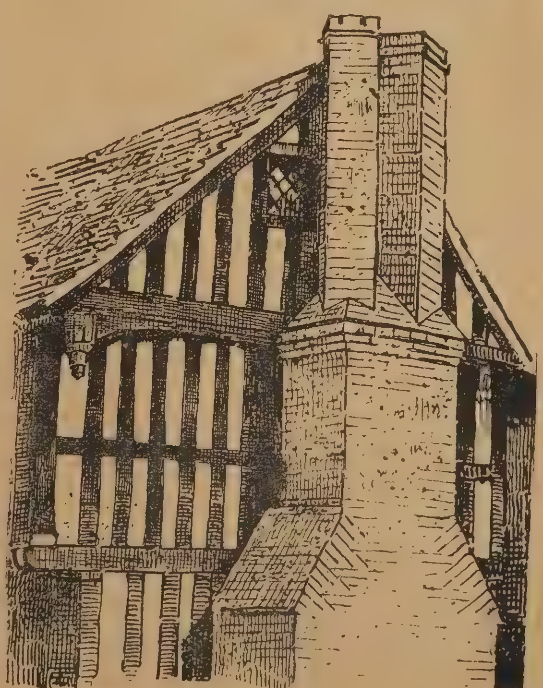
Testing Materials. The management of the Congress of Methods of Testing Materials of Construction, which will be held in connection with the Paris Exhibition next year, is in most distinguished hands. Among the members of the Committee of Organization are M. Candlot, whose reputation as an expert in the testing of materials is world-wide; Professor Bodin, of the École Centrale des Arts et Manufactures; General Gras, permanent inspector of artillery manufacture; General Borius, president of the military committee on engineering science; M. Polonceau, former president of the Society of Civil Engineers, and many others of equal note in the scientific world. The sittings of the Congress will occupy a week, from the 9th to the 16th of July. The foreign participants in the Congress will be divided into three classes, one consisting of a "committee of patronage," the members of which, as well as a certain number of honorary presidents, are chosen by the local committee of organisation from among persons in other countries known to them by reputation, while the second includes persons, or societies, who are acceptable to the managing committee, and who pay, as "membres donateurs," a contribution of not less than fifty francs; and the third includes the "membres adhérents," who pay only twenty-five francs. The committee request those who hope to be present to send early notice of their intention, it being understood that this notice does not bind them in any way, but is asked for simply to guide the committee in their plans.

Michael Angelo's Sculpture. Mr. Edward Lahtéri gave the first of a series of seven practical demonstrations and lectures in Modelling of the figure from life at the Manchester Municipal School of Art last Friday. After discussing the armature and measurements Mr. Lahtéri dealt with the division of the forms of the face, and in this connection he pointed out that one of the most important characteristics of the works of Michael Angelo, particularly in the statues of David and the slave, was the neatness and purity with which each of the forms of the face was drawn without anything being lost in the simplicity of the whole. In a cast of the head of Michael Angelo's David, placed in any light whatever, the head always retained its resemblance, and nothing seemed to have been left to chance. All remained neat and clear, the planes retained the direction required and modelled one with the other, giving movement to the whole surface. On the other hand, when a sculptor merely sought to render the impression of the model by the effect of shadows more or less mysterious, by tricks of texture or of tooling, the works produced, to preserve their quality, must be allowed to remain in exactly the same light in which they were originally produced, under the penalty of their being no longer recognisable—of that which was expressive becoming insignificant, and of reducing the work to a mere piece of plaster having none of those mysterious ideal qualities to be found in the work of an artist like Michael Angelo. In addition to artistic expression, which was the direct result of sentiment and of individual taste, the sculptor required a positive knowledge of the laws of nature. Michael Angelo had proved this to us more than any other master in the numerous studies that he had made of every part of the human body, studies in which the love of Nature and her laws was equalled only by the scrupulous conscientiousness of the work.



WESTERN ENTRANCE TO ST. MILDRED CHURCH, TENTERDEN. DRAWN BY JAMES WEIR.

Ipswich Street Improvements.—A Local Government Board inquiry has been held into the application of the Ipswich Corporation to borrow £14,200 for street improvements.



HALF-TIMBERED GABLE OF HOUSE ON ROAD FROM LYMINGE TO FOLKESTONE. SKETCHED BY JAMES WEIR.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

SOCIETY OF ARCHITECTS.

To the Editor of The Builders' Journal.

West Hartlepool.

Sir,—Would you kindly give me the address of the Secretary of the Society of Architects.—Yours truly, C. F. B.

Mr. C. McArthur Butler, St. James's Hall, Piccadilly, W.

GRAPHIC STATICS.

To the Editor of The Builders' Journal.

Manchester.

Sir,—Can you recommend me a book on Graphic Statics suitable for the Honours Building Construction and the R.I.B.A. Examinations?—Yours truly, P. C.

A good book on this subject is "Stresses and Thrusts," by G. A. T. Middleton. For a more extended work, Rivington's, Vol. 4, might be suggested. R. W. C.

SLAUGHAM PLACE.

To the Editor of The Builders' Journal.

London, W.

Sir,—Can you tell me where I can obtain particulars of an old mansion, Slaugham Place, near Horsham. It is, I believe, ruinous and about to be rebuilt.—Yours truly,

E. B.

An illustrated article dealing with this interesting old mansion is in course of preparation, and will appear shortly.

BUILDING BAY WINDOW.

To the Editor of The Builders' Journal.

Llangollen.

Sir,—A owns a public-house with a projecting sign; B owns a house and shop adjoining. Can B erect a bay window over his shop? The distance between bay window and sign would be about 6ft. Can A prevent B from erecting a projecting bay window?—Yours truly, PROJECTION.

The existence of the sign does not prevent the adjoining owner from erecting a bay window. H. P. B.

R.I.B.A. TESTIMONIES OF STUDY.

To the Editor of The Builders' Journal.

Wokinghan, Berks.

Sir,—I should be glad if you would tell me where a portfolio of drawings can be obtained suitable for copying, for testimonies of study in the R.I.B.A. intermediate examinations, and what you would recommend for this purpose.—Yours faithfully, C. H. P.

The practice of slavishly copying the testimonies of study previously submitted by some other student, is by no means to be commended. Not only should the draughtsman's skill be exhibited, but thought should be exercised. Usually the "orders" are taken from "Spiers" or "Chambers," being redrawn to a suitable scale, but the ornament sheets should be drawn either from casts or from the marbles in the British Museum. The Gothic sheets should all consist of measured drawings, there being ample material in almost all parts of England, and the construction sheets are best adapted, to suit the requirements of the examination, from office examples, though, failing these, Mitchell's sheets of constructional details (Cassell and Co.) may be used as guides. G. A. T. M.

R.I.B.A. PROBATIONERS' EXAM.

To the Editor of The Builders' Journal.

Beaufort, Mon.

Sir,—Being desirous of sitting for the probationers' exam. of the R.I.B.A., will you be good enough to give me a list of the very best books upon the various subjects treated in the R.I.B.A. syllabus, and oblige.—Yours truly,

NEW READER.

For the preliminary: Ordinary school books will suffice for most subjects; Perspective drawing—Middleton's "Linear Perspective"; Mechanics and Physics—Newth's "Natural Philosophy." For the intermediate: History and Ornament—Russell Sturgess' "European Architecture"; Anderson's "Italian Renaissance"; Fletcher's "Comparative History"; all three taken together, with Ferguson for reference; "Chambers'" or "Spiers'" Orders; Paley's "Gothic Mouldings," and Parker's "Glossary" and "Introduction to Gothic Architecture"; Stresses (theoretical construction)—Middleton's "Stresses in Structures." Geometry—Spooner's "Practical Solid Geometry"; Materials—Rivington's, Vol. III., supplemented by "Specification" (published at these offices). For the final: Ornament, as before, except Anderson's "Renaissance," which is not required; Materials and Construction, as before (this includes "Stresses"); also Stocks' "Shoring and Underpinning." For hygienic and general reference: "Modern House Construction (Gresham Publishing Company).—R. W. C.

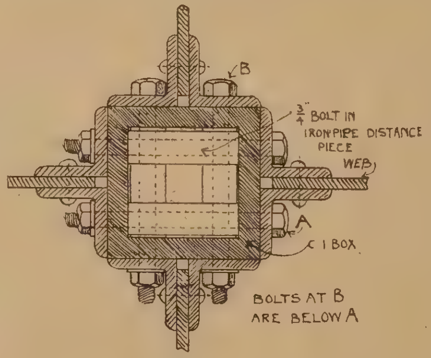
SECURING ANGLE CLEATS.

To the Editor of The Builders' Journal.

Highbury, N.

Sir,—In Model Answer to Question 9, the authors have set the builders a difficult task to bolt the angle cleats to the column. It is a simple error, but one that should not occur in a detail to be worked to.—Yours truly,

F. J. D.



PLAN

F. J. D. has misunderstood our drawing. It was intended that the angle cleats should be secured to the box (*not* the column itself) by means of through bolts, which would avoid the necessity of any manipulation in the narrow interior of the box, as will be seen from the accompanying sketch to a larger scale.—Yours faithfully,

MIDDLETON and CARDEN.

R.I.B.A. CONDITIONS OF AGREEMENT.

To the Editor of The Builders' Journal.

Workingham, Berks.

Sir,—I shall be glad of information on the following points concerning above:—

(1) Clause 2 on the front page reads thus: —"The Employer will pay the Contractor the said sum of ." Is this agreement, on the part of the employer, also held to be binding upon his heirs, executors, administrators, and assigns, without its being so stated? I notice that in the American form of contract, published in "Specification," from your offices, the last clause makes this point clear.

(2) Clause 25 on page 5, reads thus: "If in the opinion of the architect the works be delayed by *force majeure*, or by reason of any exceptionally inclement weather, or by reason of instructions from the architect, in consequence of proceedings taken or threatened by or disputed with, adjoining or neighbouring owners, or by the works or delay of other contractors or tradesmen engaged or nominated by the employer or the architect, and *not* referred to "in the Specification . . . . the architect shall make a fair and reasonable extension of time for completion in respect thereof" (Notice "not" italicised here.) This seems to imply that the contractor is responsible for the delay of parties named in the "Specification." Or could the default of the sub-contractor mentioned, in the matter of being late with the delivery of his goods, be considered a case "force majeure?"

(3) If the completion of the works were so much delayed by this cause that the contractor suffered a fine, could he recover this fine from the sub-contractor in court if there were no written agreement entered into between them as to the date of delivery, except a promise made in a letter?—Yours faithfully,

LEX.

(1) The agreement is binding on the employer's executors and administrators, but not on his heir or assigns. If the employer's personal estate is insufficient to discharge his debts, his real estate will be liable to make up the deficiency, but no personal liability will even in that case attach to his heir.

(2) The contractor would be responsible for delay of parties mentioned in the specification. The default of a sub-contractor is not *force majeure*.

(3) If the contractor did not complete his own work within the time (if any) prescribed by the sub-contract, or (if no time prescribed) within a reasonable time, he would be liable for such loss as the parties had in contemplation when the sub-contract was entered into. This, I think, would include the fine, if the sub-contractor was aware of the contractor's liability to it. A letter written after the sub-contract was entered into would not affect the case; a letter written before it might, and probably would do so. H. P. B.

ARTESIAN WELL.

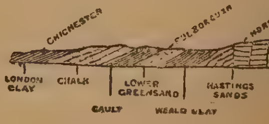
To the Editor of The Builders' Journal.

London, E.C.

Sir,—Can you or any of your readers help me? I have sunk an artesian bore hole in the Pulborough district, near the station of same name and on the bank of the river. After sinking to a depth of 40ft. down to the green sand formation I tapped a good steady supply of clear water, but so heavily charged with iron or other minerals that, though not bad to drink, it is absolutely useless for domestic uses; if spirit be mixed with it, in less than a quarter of an hour the mixture is as black as ink. If I sink below the green sand how far is it likely I should have to go before reaching softer water, capable of being used? It has been suggested to aerate the present supply to soften it. This means plant and someone to attend to it. Both the space and money at my disposal is limited.—Yours, &c.,

B. WATER.

The geological section from Chichester to Horsham, passing through Pulborough, is as shown in the accompanying illustration, by



which it will be seen that there is little prospect of any change in the character of the water unless the weald clay is penetrated, and this would mean boring to a considerable depth. It seems rather a question for a chemist to suggest means of purification.

HENRY ADAMS.

New Patents.

These patents are open to opposition until December 11th.

1898.—Door Checks.—20,793. R. Adams, London, S.E.—A slotted cam-lever is connected to the piston rod of the check and is arranged so that the check is strongest when the door is just closing. On the door being opened beyond a certain distance the lever leaves the slot in the cam-lever and the check becomes inoperative. Many modifications are included in the invention.

Flooring Blocks.—21,343. J. Hawley, Kirkby, Lancs.—Small pieces of wood are bound together by dowels or spiked plates so as to constitute blocks for paving floors, streets, &c.

Fireproof Floors.—21,584. E. Homan, London, E.C.—Bricks are used which have dovetail grooves and projections; they thus key with one another and dispense with centering. The first row of bricks is laid on the wall or girder, and the next row are hung on and cemented, and so on until the floor is made. The floor or ceiling can be covered with concrete, asphalte, or boarding in the usual way.

Machine Guards.—22,791. J. Kershaw, Hebden Bridge, Yorks.—An arm hinged to a rod at the back end of the surfacing or hand-feed planing machine carries a guard that covers the cutters and adjusts itself automatically as the boards are passed through.

Sashes.—23,489. G. C. Brown, Glasgow.—The sash cord is attached to a metal locking plate secured to the stile, and let flush into the latter is a tapered sash-plate of cast-iron. The sash is made to turn inwards for cleaning purposes, and when this is done it becomes disconnected from the plate to which the sash cord is attached, this being prevented from moving upwards by a plate on a hinged batten rod. The sash weight is thus automatically unshipped and shipped by the mere opening and closing of the sash.

Door Springs. — 23,526. H. Woods, London, E.C.—A plate having recesses for three spiral springs is let into the door post, and the outer ends of the springs are connected to a plate on that edge of the door adjacent to the post.

Sewage Tipping Troughs.—24,666. W. M. Ducat, London, W.—The trough is double, and has flat bottoms with splayed sides, a back forming a common mid-feather. The trough rests on a series of knife blades and becomes overbalanced when fed up to a certain level, discharging its contents over the surface of the filter bed.

Purifying Water or Sewage.—25,000. W. P. Thompson, London (*C. G. Gsell, Berlin*).—To the mud obtained from a previous precipitation of dirty or waste water or sewage s added as much sulphuric acid as is required o convert the bases in the mud (alumina, iron xide, iron protoxide) into sulphates; the water is then precipitated with this product.

Fireplaces.—25,400. R. Jewhurst, Margate.—The fireclay cheeks and back are corrugated and have vertical air passages, which roduces greater heat and a more perfect comustion (particularly of small coal or dust).

Prisms.—25,575. F. T. Brearley, St. Helens.—Instead of a number of separate lass prisms mounted together in a frame, one heet of glass is used, this being rolled out on recessed table. One side of the glass is ain, and the other has rows of ribs that form prismatic refracting surface.

1899.—Crushing Jaws.—1,258. J. E. and Broadbent, Stalybridge.—Steel jaws for ushing or breaking machines are made of he same thickness as cast-iron jaws. There e no recesses extending to the back, but ambers are provided, which may be closed the ends or provided with struts or ribs.

Waste-pipe Connections.—12,662. C. ylor, Eccles.—The waste-pipe outside the ilding has an elongated flanged aperture, er which the pipe leading from the bath or closet is bolted. The end of this latter pipe has a loose flange, which is prevented from falling off by the end of the pipe being turned up. By this means no special flange is required for each angle, and the making of the joint is facilitated.

Combined Bolt and Lock.—12,928. J. M. Forney, Nisbet, Pa., U.S.A.—The bolt is mounted in the ordinary way, and has an angular arm that enters a lock casing when the bolt is turned into the branch slot. When required, a key may be employed to lock the bolt in this position.

Wash Basins.—16,221. H. H. Lake, London, W.C. (*The Peck Bros. and Co., U.S.A.*)—The basin has a vertically removable plug, at the bottom of the stem of which is a disc that engages with an inclined valve that is connected by a lever with a handle.

Lead Sockets.—16,800. J. Stewart, Brixton, S.E.—A thin tube of copper, having tacks or lugs, is tinned over and placed in the socket mould, and the socket and tacks are then cast as usual. A cast lead socket is thus produced, in which is embedded a socket and tacks of greater tensile strength than cast lead.

Drawing Curves.—16,809. W. Haedicke, Ilmenais, Germany.—The frame of the device is somewhat similar to a pair of compasses. The legs have hinged shoes, through which passes a pliant rod or ruler that can be secured in any position by set screws. The rod is bent as required, and the curve drawn.

Corner Plates.—17,753. A. Fry, Bournemouth.—In order to prevent the accumulation of dirt and dust in corners—say between treads and risers—these are covered over by a triangular piece of metal, which is secured by nails or screws and may be ornamented.

The following specifications were published on Saturday last, and are open to opposition until December 18th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—14,827, Weber, apparatus for bending or straightening structural iron pipes and the like. 17,438, Ayton, radiating devices for heating or cooling purposes. 21,019, Adams, urinals. 21,887, Mountain, levelling staff used in surveying. 22,740, Hibbert, combined centrolinead and T-square for architects, artists, draughtsmen, and others. 22,742, Dorothy Fletcher, legal representative of the late John Fletcher, gate stop. 22,792, Kershaw, wood sawing machinery. 23,294, Moseley, window casements and casement frames. 24,188a, Villaret and Wahlen, means for transporting bricks and the like. (Date claimed under Patents Rule 19, November 16th, 1898.) 24,329, Rottenburg, fence or gauge for use with fret saws, band saws, and circular saws. 24,709, Oxley and Williamson, chimney pots for preventing down draughts. 24,782, Oates, earthenware or sanitary mangers for horses and cattle. 24,919, Dierickx, doors or shutters for buildings, tramway vehicles, cupboards, show-cases, and the like. 25,063, Boult (*Walsh, Ryckman, and Le Hane*), circular sectional hot-water heaters. 25,565, Page, seats of water closets. 25,618, Whichello, waste and other drain pipes and the like. 25,680, Taylor, ventilators. 25,835, Thorn & Hoddle, ball or float valves. 26,128, Ezra Stead & Edgar Rhodes, stone sawing machines. 26,665, Jackson, incandescent gas burners. 26,991, Sée, roofs. (Date applied for under International Convention, May 21st, 1898.) 27,064, Turnbull, sliding sash windows.

1899.—3,294, Raymond, brick and tile cutting tables. 8,981, Hancock, syphon cisterns for water closets. 9,730, Sayer, pipe and pipe-rail joints. 10,716, Robertson, ball valves for flushing or supply cisterns or the like. 12,871, Borgolte, manufacture of cement. 13,463, Trew, pipes and pipe couplings or connections for sewers, drains, and other purposes. 15,533, Cartwright, tiles. 15,804, Willems, process of manufacturing an enamel applicable to all kinds of bricks and other articles made of clay. 16,365, Ough and Ough, ventilators for buildings, ships, vehicles, and other structures. 16,543, Leet, alarm locks. (Date applied for under International Convention, January 21st, 1899.) 16,589, Bromley, construction of floors, arches, and the like, and centres therefor. 16,789, Pawsey, rain water, ventilating, soil, stack, drain, and like pipes. 16,983, Parsons, nail-making machines. 16,990, Neuburg, gas heating stoves. 18,164, Davies (*Fender*), fire-proof floor construction.

Professional Practice.

Horsham.—A new church is being built on a site in Rusham Road from designs by Mr. G. Scott. The contractors are Messrs. Rowland Bros. The church will be Early English in style, faced with red bricks inside and out. It will consist of a nave, chancel, organ chamber, with clergy and choir vestries. The commencement of the transepts is formed by means of double arches to each, so that at a future time the transepts may be extended further north and south without in any way interfering with the main structure. The west wall and porch will be temporary. When necessary, it is proposed to extend the nave two bays further westward, and then a permanent west porch will be erected. The windows of the church will be glazed with lead-light glazing. These and the chancel and transepts will have stone tracery; the others will be plain lancets. The floor of the chancel will be raised three steps above the nave, and the altar three steps above the chancel. There will be an open chamber roof.

New Brighton.—The Duchess of Westminster recently laid the foundation stone of the Church of Emmanuel, in Seabank Road. The new building is to replace the existing temporary iron erection, and to afford additional and improved accommodation for the parish. The plan of the church, which is to be entirely of brickwork, shows a lofty nave, 30ft. wide by 85ft. long, with low arcaded passages on each side, and shallow transepts, arcaded baptistry, and entrances at the west end on Seabank Road. The chancel is to be 33ft. 6in. long by 25ft. wide, separated from the nave by open timber work. There will be vestries and large organ space on the north side, and a morning chapel on the south side. The floor will be of pitch pine blocks, and the chair seating will give accommodation for about 700 persons. The contract for the first portion of the work has been let to Messrs. Paterson and Sons, of Liverpool, and provides for the complete chancel and accommodation for about 350. The estimated cost of this section is £3,800; the estimated cost of the entire church is £8,000. The architect is Mr. Chas. E. Deacon, of Liverpool.

Sheffield.—The formal opening of Trinity Wesleyan Methodist Church, Firth Park Road, Sheffield, took place on Thursday afternoon last. The church will form part of the Norfolk Street Circuit, and occupies a site at the junction of Firth Park Road and Owler Lane. There are four blocks of buildings. The plan is cruciform, with nave, aisles, transepts, and chancel. The church is 88ft. long by 45ft., and 63ft. 8in. wide across the transepts, and the chancel is 20ft. long; making the total length, including nave and chancel, 108ft. Splendid seating accommodation has been provided for 960 persons. One of the features of the church is the architecture of the pulpit, which is of polished alabaster, richly wrought, supported on an octagonal basis of red Mansfield stone, with polished marble columns at the angles, and is the gift of Mrs. Thomas Cole. The front is also of alabaster and black marble, also the gift of Mrs. Cole. Mr. J. Wills, of Derby and London, was the architect, and Mr. Geo. Carr, of Sheffield, the builder. The cost, including the purchase of land and architect's fees, is £9,000.

Wellington.—A new aisle at the chapel of Wellington College was dedicated on Sunday. The original architect of the College was Mr. George Edmund Street, who took for his model the famous La Sainte Chapelle, minus the crypt. Thus it consisted at first of a nave with apse, but as the number of students increased it became necessary to add an aisle on the north side. Sir Arthur Blomfield, who succeeded Mr. Street as the college architect, supplied the designs, and the building was completed last year. The beautiful stained glass windows, which were originally in the south wall of the nave, have been transferred to the new aisle, and in addition there are a triple lancet window at the west end and a wheel window at the east end, both of plain glass. Though the addition of aisles—or rather quasi-aisles, as they do not follow the strict architectural definition of the term—rather spoils the conception of a collegiate chapel, the general effect is most artistic within and without. The structure is of red brick with white stone dressings, and the apse is adorned with mosaics and frescoes. Much of the carved work represents plants, flowers, and animals indigenous to the district. The total cost of the work has been about £3,000.

St. Andrews.—The new University medical buildings accommodate four scientific departments, namely, anatomy, physiology, botany, and materia medica. There is a laboratory 38ft. by 27ft. in each department for materia medica, physiology, and botany. Each will also have a lecture room, 18ft. by 14ft., and a museum, 24ft. by 14ft. The physiology department will, in addition, have a number of smaller rooms for private research. A large practical room, 45ft. by 22ft., with a fine north toplight, is also in the anatomy department; a lecture room, 20ft. 4in. by 14ft.; and a museum, 38ft. by 26ft. It contains further a theatre, 27ft. by 24ft., with a large north toplight, which can be darkened by means of a sliding shutter. This theatre will also be used by the lecturer in physiology, but the students in that department will enter by a separate corridor. The total cost of these buildings is estimated at about £14,000. Messrs. Gillespie and Scott are the architects.

"**The Furnisher,**" the new trade journal, published by the proprietors of the BUILDERS' JOURNAL, has been welcomed with enthusiasm by all sections of the trades for which it caters. The second number, to be published next week, will contain several fresh features.

Views and Reviews.

THE CONSTRUCTION OF ROADS AND STREETS.*

The series of interesting and comprehensive articles which have appeared under the above title in our contemporary, "The Surveyor," has now been published in book form. The author, Mr. W. H. Maxwell, the assistant surveyor at Leyton, deserves special commendation for having produced a much wanted textbook, which embodies not only the latest ideas and methods of road construction, but also the opinions of the leading specialists in the department of civil engineering. Starting with a history of the subject, and ending with the Regulations of the Local Government Board, it contains all the information that one could desire, and every road surveyor should see that his library is furnished with a copy. The book is one of the St. Bride's Press series, and consequently in handy form, and we can confidently recommend the work to those of our readers who are interested in the improvement of our roads.

* "The Construction of Roads and Streets." By William H. Maxwell. St. Bride's Press, Ltd., 3s. 6d.

THE LONDON UNIVERSITY GUIDE.

This guide provides a very comprehensive account of the London University examinations, and everyone about to sit should obtain a copy of the work, for the information given is highly useful—we might almost say absolutely necessary to successful work—in preparing for the examinations. The book is issued from the University Correspondence College, which has now so bound itself up with the University that it may be said to almost form a part of it. The book contains the calendar for 1899-1900 of the College, in addition to the Guide. The Guide itself consists of five parts:—Part I. gives an interesting and useful account of the history and constitution of the London University; part II. gives particulars of the examinations; part III. a list of special subjects for 1900 and 1901; part IV. advice as to text books; and part V. consists of articles on special subjects for 1901. This last part is in the form of short descriptive biographical notes on the authors dealt with in the special subjects, and will, doubtless, prove of considerable aid to students working without the aid of a master.

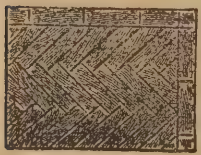
"The London University Guide and University Correspondence College Calendar, 1899-1900." Published at 32, Red Lion Square, London, W.C. Price—gratis.

Keystones.

The Grands Prix de Rome.—The awards in the competition for the Grands Prix de Rome were announced on Saturday afternoon at the annual public sitting of the Académie des Beaux Arts. The first prizes are allotted in painting to M. Louis Roger, in sculpture to M. André César Vermare, and in music to M. Charles Gaston Levadé. An address was delivered in honour of the late Charles Garnier, the architect of the Paris Opera House.

The Roman Forum.—There has lately been an extraordinary activity in excavating in Rome, with surprisingly rich results. The Roman Forum in three months is completely changed, while at Pompeii every day shows something new. Professor Baccelli, the Minister of Public Instruction, under whose guidance the work is carried on, has just returned from Benevento and Pompeii, where, at the former place, a majestic Roman theatre has just come to light. A few stones have always been visible, but no one supposed them of any interest, until some preliminary investigations revealed an arch of the entrance to a theatre, composed of enormous blocks of travertine. From the parts brought to light it is deduced that this theatre will be one of the most important and perfect found up to the present. It is about the size of the Roman theatres of Pompey and Marcellus, and is better preserved.

Recent Discoveries at the Inner Temple were the subject of a paper read by Judge Baylis at the inaugural meeting of the winter session of the Royal Archæological Institute on November 1st. In the early part of the present year the Benchers of the Honourable Society of the Inner Temple decided, he said, to increase their safe accommodation, and for this purpose excavations were commenced beneath the hall and the chapel. Under the former building an old doorway and staircase in the east wall of the inner buttery of the Inner Temple were discovered. The appearance of the doorway and staircase indicated that they formed part of the chamber occupied by the Knights Templars, which was consecrated in 1195. The walls were 5ft. or 6ft. thick. Another paper, entitled "The Sepulchral Banquet on Roman Tombstones," was read by Mr. F. J. Haverfield.



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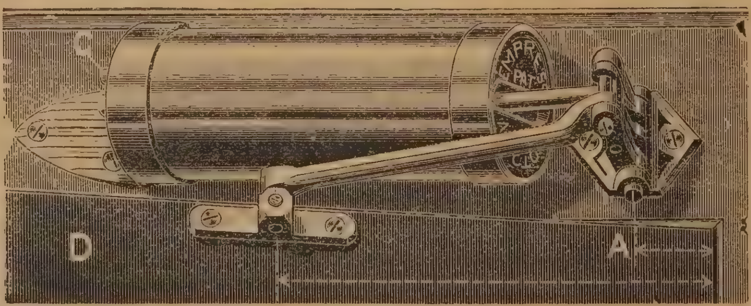

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Do. floor brads	do.	9 15 0	10 15 0
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Do. English ingots ...	do.	141 0 0	141 10 0
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Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	10 0 0	11 0 0
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Do. Quebec Pine, 1st...	do.	19 5 0	24 10 0
Do. do. 2nd	do.	13 15 0	15 15 0
Do. do. 3rd &c.	do.	9 10 0	—
Do. Canadian Spruce, 1st	per P. Std.	10 10 0	—
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Do. Tobasco	do.	0 0 3 15/16	—
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Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 6 7/32	—
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Do. St. Domingo ...	do.	0 0 6 25/32	—
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Teak, Rangoon, planks ...	do.	9 10 0	16 10 0
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Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 1 7	0 3 11

COMING EVENTS.

Wednesday, November 8.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and Demonstration at Common Lodging House. Prof. Henry Robinson, M.I.C.E., on "Sewerage and Sewage Disposal," at 8 p.m. Council meeting at 5 p.m.

Edinburgh Architectural Society.—Mr. Robert Wilson on "The Planning of Schools." 8 p.m.

St. Paul's Ecclesiological Society.—Meeting at 8 p.m.

Thursday, November 9.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers).—Demonstration of Book-keeping as carried out in a Sanitary Inspector's Office, in the Parkes Museum at 8 p.m., by Mr. Albert Taylor.

London Institution.—Professor W. M. Flinders Petrie, D.C.L., on "Prehistoric Egypt." (Illustrated.) 6 p.m.

Friday, November 10.

Architectural Association.—Mr. W. Brindley on Marble." 7.30 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. Reginald Dudfield, M.A., M.B., on "The Practical Duties of a Sanitary Inspector." 8 p.m.

Arts and Crafts Exhibition Society (New Gallery, Regent-street, W.).—Mr. H. Wilson on "The Pre-Raphaelite School in Relation to the Revival of Design and Handicraft." 8.30 p.m.

Birmingham Architectural Association.—Mr. George P. Bankart on "Old Plaster Work." 6.45 p.m.

Glasgow and West of Scotland Technical College Architectural Craftsmen's Society.—Mr. John Arthur on "Estate Feuing Plans, and their Preparation." 8 p.m.

Saturday, November 11.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and demonstration at the Sewage and Destructor Works, Ealing, at 2.15 p.m., conducted by Mr. Charles Jones, M.I.C.E.

Architectural Association of Ireland.—Visit to the Franciscan Convent, Merchant's Quay, Dublin, at 2.45 p.m., by permission of Mr. W. Doolin, B.A., the architect.

Monday, November 13.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers).—Sir Richard Thorne Thorne, K.C.B., M.D., F.R.C.P., F.R.S., on "The Sanitary Inspector in Relation to the Public Health Service." 8 p.m.

London Institution.—Mr. Henry B. Wheatley, F.S.A., on "The Tower of London: Fortress, Palace, and Prison" (Illustrated). 5 p.m.

University College, London.—Dr. Samuel Rideal, F.I.C., on "Processes for the Treatment of Sewage."

Surveyors' Institution.—Ordinary General Meeting at 8 p.m.

Tuesday, November 14.

Sheffield Society of Architects and Surveyors.—Mr. J. R. Wigfull on "Some Old Derbyshire Houses."

Wednesday, November 15.

Society of Arts.—Opening Meeting of the Session. Address by Sir John Wolfe Barry, K.C.B., F.R.S., Chairman of Council. 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting at 8 p.m.

British Archæological Association.—Meeting at 8 p.m.

Sanitary Institute.—(Lectures and Demonstrations to Sanitary Officers.)—Mr. W. Hunting, F.R.C.V.S., on "Signs of Health and Disease in Animals destined for Food, when alive and after slaughter. Tuberculin and other tests." 8 p.m.

Thursday, November 16.

London Institution.—Mr. George Langley on "Music in its Relation to Painting and Poetry." (Illustrated.) 6 p.m.

Institute of Sanitary Engineers (Incorporated.)—Members' Sessional Meeting at 8 p.m.

Worshipful Company of Carpenters.—(Lectures on Sanitary Building Construction at Carpenters' Hall, London Wall.)—Mr. James Bartlett, M.S.A., on "Setting out Work, and By-laws." 7.30 p.m.

Arts and Crafts Exhibition Society (Lecture at the New Gallery, Regent-street, W.).—Mr. Halsey Ricardo on "The Gothic Revival." 8.30 p.m.

Friday, November 17.

Architectural Association.—(Discussion Section.)—Mr. Robert Williams on "Tenement Houses for the Working Classes." 7 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. W. Hunting, F.R.C.V.S., on "The Names and Situations of the Organs of the Body in Animals." 8 p.m.

Saturday, November 18.

Dundee Institute of Architecture, Science and Art.—Visit to Villa in West Ferry, by permission of Mr. J. Murray Robertson. 2.5 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and Demonstration at St. Marylebone Stone Yard. 3 p.m.

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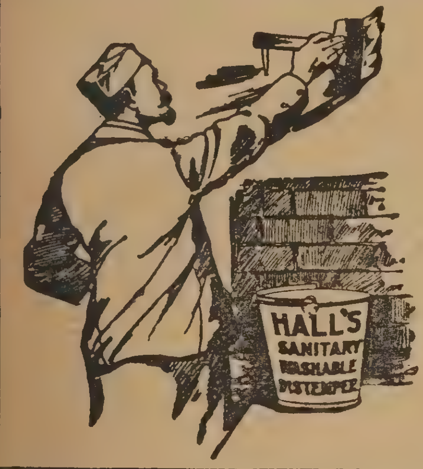

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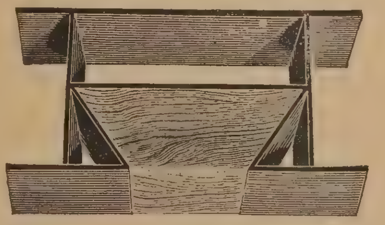

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RUSHDEN (Northants).—For additions to factory, Moor-road, Rushden, for Mr. C. W. Horrell. Mr. H. Adnitt, architect and surveyor, High-street, Rushden, R.S.O. Quantities by the architect :—

R. Marriott	£1,630	T. Swindall	£1,367
W. Packwood	1,394	T. Wilmott	1,317
Whittington & Tomlin	1,387	C. E. Bayes *	1,310
T. and C. Berrill	1,379	Dickens Bros.	1,050
H. Sparrow	1,375		

* Provisionally accepted.

SIDCUP.—Accepted for the erection of a conservatory at Kent Lodge, Sidcup, Kent, for Mr. W. T. Cross. Mr. A. E. Mullins, architect and surveyor, 16, Church-street, Camberwell-green, S.E. :—

Messenger and Co., Ltd.	£116

SOUTHAMPTON.—For erecting the Central District Board School. Messrs. Lemon and Blizard, architects, Southampton :—

Playfair and Toole	£10,660	Stevens and Co.*	£9,826
H. Cawte	9,978	Jenkins and Sons	9,774
F. Walter	9,887	Holt and Son (withdrawn)	8,952
T. Rashley	9,875		

[All of Southampton.]

Architects' estimate, £10,000. * Accepted.

STAINES.—For the erection of schools, Stanwell-road, for the School Board. Messrs. Murray and Dibdin, architects, 5, Hurstbourne-road, Forest-hill, S.E. Quantities by Mr. J. H. H. Doughney, 170, Coldarbour-lane, Camberwell :—

Baker and Co., Ltd.	£4,171 9 10	Drowley and Co.	£2,729 0 0
T. G. Sharpington	2,900 0 0	Young and Son	2,700 0 0
F. & H. F. Higgs	2,876 0 0	W. Hawkins, Reading *	2,656 0

* Accepted.

YOUGHAL (Ireland).—For the construction of main sewers, Knockaverry, for the Urban District Council. Mr. W. H. Hill, jun., C.E., 28, South Mall, Cork :—

P. Murphy	£2,300 0	M. Connors, Youghal, co. Cork*	£1,600 0
Murray and Son	1,857 12		
J. White	1,840 0		

* Accepted.

CONTRACTS OPEN.

PARISH of LIVERPOOL.

TO BUILDERS AND CONTRACTORS.

The Select Vestry of this Parish are prepared to receive TENDERS for the ERECTION, at Olive Mount, Wavertree, near Liverpool, of a group of BUILDINGS, forming a Cottage Home School, for the accommodation of about 400 children, according to plans and specifications to be seen at the Office of the Architect, Mr. EDMUND KIRBY, 5, Cook-street, Liverpool, between the hours of TEN o'clock a.m. and FIVE o'clock p.m.

Bills of quantities, conditions of contract, and forms of Tender (upon which above offers will be received) may be obtained at the Office of the Architect on payment of a deposit of Three Guineas, which will be returned upon the receipt of a bonâ-fide Tender for the works. Sealed Tenders must be delivered to the undersigned not later than MONDAY, the 11th day of DECEMBER next.

The Select Vestry do not bind themselves to accept the lowest or any Tender.

H. J. HAGGER,
Vestry Clerk.

Parish Office, Liverpool.
November, 1899.

TO BUILDERS.

The Commissioners of H.M. Works and Public Buildings are prepared to receive TENDERS for RETAINING WALLS and FOUNDATIONS for the proposed new PUBLIC OFFICES, Parliament-street, Westminster.

Drawings and specifications, which have been prepared by Mr. J. M. BRYDON, F.R.I.B.A., together with a copy of the conditions and form of Contract may be seen on application to SIR JOHN TAYLOR at the Office of Works.

Bills of quantities have been prepared for the use of Builders by Messrs. FRANKLIN and ANDREWS, of 25, Ludgate-hill, E.C., and Mr. J. E. DROWER, of 16, Great George-street, S.W., and, together with forms of Tender, may be obtained at the undermentioned Office on payment of One Guinea. The sums so paid will be returned to those persons who send in Tenders in conformity with the conditions specified below.

The Commissioners do not hold themselves responsible for the accuracy of the quantities, nor do they bind themselves to accept the lowest or any Tender.

Tenders are to be delivered before TWELVE o'clock noon, on WEDNESDAY, NOVEMBER 15th next, addressed to the Secretary, H.M. Office of Works, &c., Storey's-gate, London, S.W., and endorsed "Tender for Foundations, &c., Public Offices, Westminster."

H.M. Office of Works, &c.,
October 1899.

TO BUILDERS and CONTRACTORS.

The Brading School Board invite TENDERS for the ERECTION of a Higher Grade BOARD SCHOOL on a site near the Railway Station, Sandown, I.W.

Plans and specifications can be seen at the Offices of Mr. JAMES NEWMAN, Architect, "Thornton," Sandown, from whom all further particulars can be obtained. Copies of Quantities can be had by application to the Architect on payment of a deposit of 5s., which will be returned upon receipt of a bonâ-fide Tender.

Tenders to be sent in on or before NOON, NOVEMBER 14th, to the undersigned.

The Board do not bind themselves to accept the lowest or any Tender.

(Signed) HARRY C. GRAPES,
Clerk to the Board.

Sandown, I. of W.
October, 1899.

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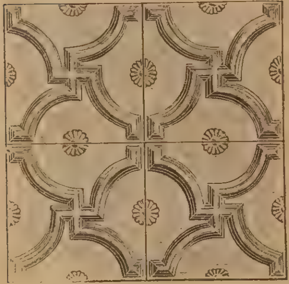

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NOVEMBER 8TH, 1899.

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CISTERNS.*

THEIR USE AND NECESSITY WITH CONSTANT WATER SUPPLY.

By ERNEST COLLINS, M.I.C.E.

THE provision of cisterns for the storage of water used in factories and private dwelling houses is absolutely necessary to enable the consumer to obtain an uninterrupted supply of water in the event of temporary stoppage of supply, caused by accident or unforseen circumstances. The constant supply of water cannot always be maintained without interruption owing to various causes, such as leakage from, or breakage of main pipes, communication pipes, lead pipes, and internal house fittings, and in some instances through a partial failure of the supply. Such failures have occurred at various times in nearly all our large towns, and in numbers of small towns and villages, resulting in a partial or restricted supply, necessitating the shutting off of the water for varying periods of the day and night. The abolition of cisterns has been found to be very detrimental where a restrictive supply has of necessity been resorted to. In houses of the smaller class inhabited by the very poor, the want of proper receptacles for the storage of water is very inconvenient. It is quite customary in business premises, factories, and large dwelling-houses, to provide cisternage of sufficient capacity to guard against interruptions of supply, and it is imperative that cisterns should be provided for supplying water for the use of steam boilers, hot water boilers, w.c.'s, and urinals. This is provided for in nearly all Acts of Parliament and regulations relating to water supply. As to

The Provision of Reservoir Cisterns

in small dwelling-houses, I am of opinion that cisterns of sufficient capacity for at least twelve hours supply should always be provided, and all the water fittings in the house should be supplied from it, a draw-tap attached to the main supply pipe being provided for drawing water for dietetic purposes.

As regards the size of storage cisterns, there is considerable conflict of opinion as to the capacity to be provided: a convenient form of calculation is a specified quantity, say twenty gallons per room of house or tenement; this for a house of six rooms would give the storage capacity as 120 gallons, by no means an excessive quantity. The practice of supplying dwelling houses without cisterns causes the consumers to place ordinary washing tubs under the draw taps to guard against an interruption of supply, and during the time the water is shut off, all manner of objectionable utensils are dipped into these tubs. In some towns to obviate the inconvenience arising from an interruption of the supply through the shutting down of mains, notice is given in local papers, &c., that the water will be shut off for so many hours on certain days in each week to enable repairs to be carried out. This causes consumers whose premises are not provided with cisterns to make other provision in the shape of a washing tub as described above. Even under this system the water has often to be shut off at other times for the repair of fractured mains, &c.

The Abolition of Cisterns

also causes a large waste of water, as the draw-taps over the tubs are usually left partly open. As an illustration of the wastefulness of this system in London, constant supply was introduced without cisterns to a district of 13,282 houses, having a population of 100,930 persons, and the average consumption was 1,554,152 gallons per day, or 15·3 gallons per head per day. I introduced a constant water supply to a district of 7,708 houses, having a population of 51,043 persons, each house having or retaining its own cistern, with the result that the consumption per day was 10·9 gallons per head. Trade supplies are excluded from both districts. These figures tend to show that from an economical point of view the provision of cisterns is desirable.

In some instances cisterns are provided and the supply pipe to same is also made to act as draw-off pipe. By this plan the whole of the fittings are supplied from the main until an interruption of supply occurs, when the stop back valve nearest the main closes, and the stop back valve nearest the cistern opens, and supplies the fittings from the cistern. This system is very objectionable in practice, as in the event of the water not being shut off in the main for a long period, the water in the cistern becomes stagnant, and upon the water being shut off this stagnant water is supplied to the fittings for the use of the building. It however finds favour with some builders, as the cost is lessened by reason of not having to provide a second or draw-off pipe. In providing and fixing cisterns great care is required to obtain

A good Circulation

of water through them, and the provision of too large a cistern is nearly as bad as the preceding plan. In small dwelling houses and tenements, 20 gallons per room is sufficient, and in large houses, 30 gallons per room will not be excessive. Factories, business premises, stables, &c., require sufficient storage for at least twenty-four hours' supply. The system recommended by the writer where cisterns are provided from which fittings are supplied is as follows:—

A communication pipe is taken from the main to the premises, a screw-down stop valve being provided at the entrance. This pipe is carried to the cistern and attached to it; and before reaching the cistern there are one or more draw taps for drawing water for dietetic purposes only. The remainder of the fittings supplying w.c.'s, urinals, taps, &c., are supplied by a separate draw-off pipe from the cistern. By the adoption of these arrangements the water is kept circulating through the cisterns for use of urinals, w.c.'s, &c., and in the event of an interruption of the water supply, the occupiers are enabled to continue to use water for sanitary and other purposes uninterruptedly for at least twelve hours.

In another system, adopted in some cases, the whole of the draw-taps for drawing water are supplied from the main supply pipe, and the fittings supplying w.c.'s, urinals, &c., are supplied from the cistern. This system no doubt has its advantages, but when the supply is interrupted, the occupier can continue the use of water for sanitary purposes only, and is unable to obtain any water for other purposes without, as frequently happens, dipping out of the cistern supplying closets, &c. Under this system also, the cisterns are very much neglected, no person taking any trouble to cleanse them, and it has been found that in some cases the water becomes so bad as to partly stop up the supply to the w.c.'s, &c. The

Choice of Cisterns

depends in a large degree on the quality of water supplied, and also for what purpose they are intended to be used. For hard water, the ordinary galvanised cisterns are extensively used, and last many years; these are usually sold without covers, and are generally provided with covers of wood, zinc, or other light material. Wooden cisterns, lined with lead or zinc, slate cisterns, and stone cisterns, are all provided with covers similar to the galvanised iron cistern. Lead and zinc-lined cisterns and those made of slate and stone are not now generally used, and are gradually being replaced by the galvanised cistern. Water-butts are prohibited by nearly all water works regulations and are almost extinct. The closed cistern to withstand the pressure of the street mains being very expensive is very little used, and when connected with heavy pressure is highly dangerous; also, no provision is made for cleansing, and it appears to be unsuitable for general use.

An improved "self-cleaning air-tight cistern" has been devised by Mr. Hugh Alexander, chief sanitary inspector for Shoreditch. This cistern is expensive, but it is undoubtedly a valuable improvement in domestic water cisterns. It has been adopted in the design first advocated by the London County Council for its new model dwellings at Millbank. In filling water-bottles the tap should be allowed to run for a moment, so as to flush the sediment out from the leaden pipe before the bottles are filled. Bright water from the iron cistern is then obtained. It is an excellent and practical cistern, but at present its cost appears to limit its general use.

The galvanised iron and wooden cisterns lined with lead or zinc are unsuitable and dangerous for soft water. Slate, stone, cement, and other compounds of a like nature, are alone suitable for soft water.

The position of cisterns is one which requires special attention, and some of our architects appear to have forgotten to make provision for their reception, and cisterns are fixed in any available situation, inaccessible to the ordinary occupier for cleansing and inspection. The practice of fixing cisterns on the roofs of buildings, even in the rare cases where means of access are provided, is very objectionable, as these cisterns, although covered, are usually unprotected from frost and the sun's rays, and are rendered useless by a slight frost. Cisterns in these positions should be well protected against the effects of frost, and tight-fitting covers provided. Another common practice is the fixing of cisterns in roofs. They are unseen, and their existence is often unknown to the occupier.

Still another objectionable practice is fixing cisterns under floors—in some cases under bedrooms and even under w.c. floors—and allowing soil pipes or drain ventilating pipes to pass through them. Cisterns should be placed where they can be seen, and should be readily accessible for periodical inspection and cleansing, and it should be the duty of our sanitary authorities to see that the cisterns are placed in such suitable positions. It should also be the duty of waterworks authorities, through their staff, to give notice to the sanitary authorities of the existence of dirty cisterns in order that notices might be served for cleansing. As regards the

Cleansing of Cisterns,

it is difficult to secure good administration on the part of all householders in respect to the care of their own water cisterns; and to some extent the regulation of the water companies requiring an overflow warning pipe, but allowing no standing waste of any sort, makes it impossible to clean out the cistern by direct flushing. This regulation might be modified with advantage. In no case ought a cistern to be so constructed that it cannot be emptied except through the drinking-water taps. It is very difficult to effectively clean out a cistern, except through a standing waste so inserted as to completely empty the cistern, and to allow it to be flushed out effectively by the supply tap, while the sides and bottom of the cistern are lightly swept down with a soft hand broom. The pipe for the service of the drinking-water taps should in all cases be an inch above the bottom of the cistern, so as to allow a thin layer of sediment to subside below the level of the drinking-water outlet. This condition alone renders it impracticable to efficiently flush out sediments through the drinking-water taps. A standing waste, leading to the warning pipe, is the best arrangement. In case of overflow the proper warning is then given; while by simply lifting the standing waste the cistern can at once be flushed out perfectly. Of course the standing waste must in no case have any sort of communication with a drain pipe. A rubber garden hose pipe may be attached to the end of the warning pipe while the cistern is being flushed out, and in that way the flushing water can be discharged over a trapped gulley at a convenient point.

The Manchester Statue of the Queen, for which a site has been selected opposite the Infirmary, is to be of bronze and not of marble as was originally intended. The change has been made on account of the liability of marble to be affected by the smoky atmosphere of the city.

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* A paper read before the Annual Congress of the Sanitary Institute, held at Southampton on August 29th, 30th, and 31st.

Builders' Notes.

Building at Dumfries.—The value of the plans passed during the year now ended was £20,520, this being made up as follows:—Dwelling-houses, £14,000; hotels, £1,000; business premises, £4,180; offices, stables, &c., £560; lodging-houses, £600; halls, £180.

Jerry Builders Reprimanded.—The jerry builders in East Worcestershire have received a sharp lesson from the Yardley District Council. For several months past complaints have been made to that body with regard to jerry-built houses, and representations have been made to the builders concerned. No improvement, however, has taken place, and now the local authority has ordered the demolition of certain buildings at Wake Green.

A New Stone-sawing Machine.—An exhibition of the capabilities of the patent "Rapid" stone-sawing machine was recently given at Wellington Bridge, Leeds, to a number of local quarry owners and others interested in the stone trade. Within an hour the fourteen blades, each having thirteen notches, sawed through two blocks of Howley Park stone, measuring respectively 6ft. by 5ft. and 5ft. square. Compared with other apparatus in use for cutting stone, marble, and granite, the machine would appear to be a decided and most valuable improvement. It is constructed on an entirely new principle, and the inventors, Messrs. Rhodes and Stead, claim that it will turn out 100 per cent., and in some cases 400 per cent., more work than any other machines in the same time, and with the same cost of power and labour.

Remarkable Differences in Tenders.—For the execution of certain works on the Skibo Castle Estate of Mr. Andrew Carnegie, thirteen firms recently sent in tenders. The highest sum asked was £22,147, the next tender was for £15,222, then there were various intervening prices down to £11,263 (which was accepted), the lowest of all being £9,156. These widely-differing figures seem to indicate either a haphazard method of framing estimates, or very different notions as to the proper percentage to be charged for profit. The works to which the tenders had reference form only an item in the important improvements which Mr. Carnegie has arranged to carry out at Skibo. Two large locks are to be constructed, for boating and angling purposes, together with a dam 250 yards long and 12ft. high. At a point near the castle a large swimming-bath is being erected, which is to be supplied with water drawn from the Firth by a steam pumping-engine. It is also contemplated to make a new approach to the castle from the west, about a mile and a half long, and to lay out the grounds on both sides as parks.

London County Council.—At the meeting of the Council on October 31st it was decided to seek Parliamentary powers to acquire Spitalfields Market. The Water Committee reported that they were of opinion that the only way to ensure a high state of purity in the London water supply was to make a daily examination of the water delivered to the consumers. The chemist was authorised to continue the analyses of the water of the Thames and Lea above the companies' intakes, and of the water drawn from the companies' mains, for a further period of three months, at an expenditure of £37 a week. It was decided to purchase certain properties in order to partly widen Bell Lane, Whitechapel, from 11ft. to 40ft. The net cost of widening Bell Lane throughout, and the southern portion of Crispin Street, would be about £133,900. The Highways Committee reported that £902 had been spent in repairing the damage to the Queen Victoria Street subway, caused by the subsidence of the ground in connection with the tunnelling of the City and Waterloo Railway Company. The company are being asked to refund this amount to the Council.

City Corporation.—At the last meeting of the Court of Common Council the Lord Mayor said this year would be memorable for the passing of the London Government Bill through Parliament, whereby the advantages of direct municipal life, so long enjoyed by the citizens of London, had by the creation of thirty new municipalities been extended to every district of the entire metropolis. At the instance of the Sanitary Committee, it was resolve to seek Parliamentary sanction next session for the erection of a crematorium at the City of London Cemetery at Ilford, and for powers to enable the Corporation to construct baths and washhouses in the City. It was also decided to seek powers to permit the Corporation to make provision for the accommodation of pipes, wires, and cables under the public ways, for the construction of bridges, and to apply the consolidated rate to the maintenance of open spaces in the City. The Court, on the application of the Charing Cross and Strand Electricity Supply Company, approved a site at Marsh Gate Lane, Bow, for a generating station. The Bridge House Estates Committee were instructed to report upon the existing facilities for traffic across the river; to make suggestions for increasing the number of bridges, and to report upon the desirability of constructing a viaduct from Queen Street on to Southwark Bridge.

Who should Repair the Roof?—At the Leeds County Court on Friday, Mr. J. C. Kershaw, surgeon, Wellington House, Bruce Street, New Wortley, sued Mr. Thomas Eddison, his landlord, for £7 3s. 7d., for breach of covenant. Plaintiff took from defendant Wellington House, on a ten and a-half years' lease at £54 a year, the agreement stipulating that the plaintiff was to keep the inside of the house in good repair, and the defendant to repair the exterior. Soon after entering the premises plaintiff found that the roof of the surgery, which had been built by his predecessor, was in very bad condition. The lessor put on new slates, but the roof, which was flat and had a skylight, was still leaky, and plaintiff wrote to him repeatedly, informing him that from time to time water came through into the surgery and caused much inconvenience and annoyance. As nothing further was done by the lessor to remedy the defect, the plaintiff consulted Mr. Winn, architect, and, at his suggestion, had the roof stripped and re-slated, the total cost of the repairs—including Mr. Winn's fee—being £7 3s. 7d., the amount of the claim. Mr. Waugh (for the defendant) submitted that there had been no breach of the covenant, inasmuch as what the lessor agreed to do was to keep the premises in repair, not to carry out any re-construction, which was practically what the plaintiff had done. His Honor gave a verdict for the plaintiff for the amount claimed, less the architect's fee of two guineas, with costs.

Protection of Workmen on Buildings.—An important issue was raised at the Victoria Law Courts, Birmingham, in an inquiry held by the City Coroner, Mr. J. Bradley, concerning the death of Walter Broughton (25), a journeyman bricklayer, of West View, Clent. The deceased was engaged with another man in tiling the roof at the Higher Grade Schools, Whitehead Road, Aston, which are being erected by Messrs. John Bowen and Sons. Mr. S. H. Knyvett, H.M. Inspector of Factories, was present. At the inquiry no member of the contracting firm was present, but their foreman stated that the reason there had been no protection for the men working on the roof was that they had not had time to raise the scaffolding; the deceased had slipped whilst walking along the cornice, and fell a distance of 45ft. to the ground. He was conveyed to the General Hospital, where he died shortly after admission. The jury returned a verdict of "Accidental Death." Mr. Knyvett said it was a very great pity that some measure of protection was not afforded under the Factory Act to persons employed on buildings such as there was to those employed in factories. In a case of this sort, if it had come under the Factory Act, the firm would have been bound to have provided some protection. Factory inspectors had no power to compel builders to provide fencing or other safeguards, and the Home Office had no power to issue any kind of order. The coroner intimated that he would probably write to the Home Office, and Mr. Knyvett stated he would support him. Mr. Shipley, the foreman, agreed that the inspector's idea was a very good one, and he hoped some such definite rule as to scaffold fences would be laid down.

Admiralty Contracts.—The case of the Admiralty Commissioners v. Bligh was heard before Mr. Justice Grantham and a special jury on Friday. Mr. Acland, in opening the case, said that in 1894 the Admiralty were desirous of erecting in the river, just above Sheerness and below Chatham, important defensive works, for the prevention of torpedo-boat attacks up the River Medway. These defences consisted of what was called an anchorage and a pier on either side of the river. It was alleged that defendant had put in piles of timber of improper length. The defendant had also omitted, in some instances, to use concrete and rubble where specified, and had completed the whole work in a way that might have proved to be a danger instead of a defence. The work done showed that the defendant must have deliberately made up his mind to commit a fraud. Suspicion was aroused with regard to the bolts used, and on examination a certain number of them were found to be spikes, with the appearance of bolts, and must have been made on purpose to deceive those whose duty it was to look after the work. Mr. Thomas Sims, Superintendent Civil Engineer to the Admiralty, gave evidence in detail, showing that the contract had been most improperly carried out, the piles in some cases being 6ft. and 7ft. short, and, instead of 20ft. of concrete being used in one place on the south shore, only 12ft. were used, and the mud below had not been removed. Mr. Witt (for the defendant) said he had listened to the case, and he did not see that he ought to resist it, but he wished to say this: The certificates had been given, and the work had been completed nearly two years, before the case was made against the defendant. Of course, that was no answer to the claim now put forth as to the hidden nature of the defences, and he therefore said the plaintiffs should have a verdict for the £914. Mr. Joseph Robert Bligh, the defendant, was then called, and said he had a person on the works in conjunction with the Admiralty officials, and, though he was there occasionally, he had no improper dealings in any way with Mr. Monkhouse. Until he received the letter from the Admiralty complaining of the work, he did not himself know there was anything wrong. Mr. Justice Grantham said, as the matter stood, it was not necessary for him to sum up, but in this case he thought he ought to make a few remarks in regard to Government contracts. Government contractors ought to know that these matters might be criminal; if they were not, then they ought to be made criminal. In his opinion, where a man entered into a contract where the safety of the country was concerned, and committed a breach of it, he committed a crime. For instance, the whole of the troops on board one of our ships now on their way to South Africa might be burned through a contractor supplying heated hay, and could they imagine anything so criminal? Could any punishment be too severe for people who broke faith in that way? He mentioned this because he considered that when a person broke a contract in which the safety of our country was concerned, he ought to be dealt with as a criminal. If it was not a criminal offence it ought to be made one, and when the defendant said he trusted to an agent he could only say that it should be a criminal offence to trust to an agent in that way; but he thought the jury would not believe him.—The jury, by direction, then returned a verdict for the plaintiffs for £914, and his lordship gave judgment for that sum, with costs, and certified for a special jury.

Masters and Men.

Strike of Bricklayers at Ilford.—A serious delay is occurring in the erection of two schools for Ilford School Board, through a strike on the part of the bricklayers. The cost of one of the buildings is £21,000, and of the other £16,000. The former should have been finished some time ago.

Eight-Hour Day for London Engineers.—The eight-hour-day system has been intoduced at Messrs. Penn and Sons' engineering works, Deptford and Greenwich. The works have recently been taken over by the Thames Ironworks Company, Limited, who have followed the system at their other works for some time past with satisfactory results.

Strike at Newark, Mon.—The men at Messrs. Cafferata and Co.'s plaster works struck work last Tuesday week. The strike only affected a section of Messrs. Cafferata's men—those interested in the heaving of the plaster from the pits. About seventy men struck for an increase of wages, and were incensed to find that thirty of their comrades refused to act with them. When the latter attempted to resume work last Wednesday morning, the strikers menaced them. The police were sent for, and arrived in time to stop violence to the alleged "black legs." The strikers were dispersed by ten policemen, and the works were guarded. The men went away, but returned in the vicinity of the works on Thursday, and intimidated those who were in defiance of them continuing their employment. For some time matters had assumed an ugly look, but the presence of the police had a salutary effect. Subsequently a compromise was arrived at, the masters agreeing to give a halfpenny per yard more for the plaster raised. It is understood that thirteen summonses taken out by Messrs. Cafferata and Co. against the men for intimidation have been withdrawn.

The Scottish Carters' Association recently issued a circular to the employers in the East and West of Scotland threatening to strike unless an increase in wages of 2s. per week and a reduction to fifty-six hours per week, and payment for Sunday labour was given. The demands have been settled by a compromise, the employers agreeing to give 1s. advance in wages. The question of Sunday labour was left over. Mr. James Coull presided over an attendance of probably between 500 and 600 of the Edinburgh and Leith carters, to consider the offer. After its acceptance the following resolution was agreed to, on the motion of Mr. A. Philip, secretary of the Leith branch:—"That this mass meeting of Edinburgh and Leith carters, having heard of the concessions made and offered to the men, we, with a view to promote harmony and a fair understanding between employers and employed, and with a desire to avoid a conflict which would jeopardise the interests of the trade and the workmen, agree meantime to accept the terms offered of 1s. per week of advance all round as a partial settlement, and call upon all carters to at once close their ranks by joining the Scottish Carters' Association, as the only effective means whereby the carters of the country will secure wages and other conditions comparable with other trades."

The Workmen's Compensation Act.—At the recent dinner of the Article Club, Mr. Richard Bell said his society (the A.S.R.S.) had fought thirty-eight cases in the law courts, and there had been thirty-eight different decisions. Sir Charles Dilke said the Act was a great experiment, and there was therefore difficulty in applying it to those cases where ill-health was caused by the nature of the employment. In the cases of small employers he preferred the German system, under which the State, and not the employer, should pay the indemnity, and be the national assurance authority. The Act was a novel experiment, and therefore legal decisions must necessarily put different constructions on the Act to those expected by its promoters. These promoters desired that the Act should be covered by insurance schemes covering all injuries, and he for one believed that such schemes offered a solution which ought to be taken advantage of. In his own constituency, such a scheme had been adopted. Workmen and employers paid half the cost of insurance, and it had been found that the accidents during the first two weeks cost as much as all the others, and therefore to apply the Act to all accidents meant doubling the cost of insurance. He could not see that it was possible to bring in the agricultural labourers, the shipping interests, and the fourteen-days accidents under the Act unless the State would be a guarantor that compensation would be paid. Mr. Justice Darling said whether the Act had worked well or not they must admit that there was probably never put upon the Statute Book a more difficult Act to administer. It was the first attempt to make a piece of admitted Socialism a part of the law of England. It might be the beginning of further Acts in the same direction, but they must not expect that legislation, which did not deal with crime or property, should always be interpreted in the same manner by different judges.

Leeds City Carting Agents' Association.—A meeting of the Leeds City Carting Agents' Association was held last Saturday in the Old George Hotel, Briggate, to protest against the by-law of the Corporation prohibiting one man driving more than one horse within a mile radius of Commercial Street. The chair was occupied by Mr. S. J. Stott. The association has only been in existence for nine months, but has had a very successful career, already having nearly fifty members, owning between four and five hundred horses. The objects of the association are to promote the commercial interests of the members and to afford them assistance, and, where necessary, protection in legal matters. The secretary, Mr. J. McGrail, stated that he had been informed by the Town Clerk that the by-law had not been put into force yet, and in all probability it would not be till January 1st. The law would make a very serious difference to many agents, and there were members of the association who had been put to an expense of £50 during the week in obeying the by-law, which they believed to be in force. He complained of the interference of the police in stopping drivers with two horses, and taking their names, without giving them any notice. Mr. J. T. Harrison considered that a man in charge of two horses and carts had quite as much control over the horse behind as the man who was driving a team of three horses had over the horse in the traces in front of the other two. The by-law was most unfair. If the Corporation decided that there should be one man for every horse, they should apply the rule to the whole city, and not limit it to a mile radius.—Mr. Redshaw said the result would be that agents would be compelled to employ a man and a boy or two boys. They could not afford to employ two men for two horses.—Mr. Treen favoured the idea of one man for one horse, on the ground that it would be better in the long run for the agents, who, if they were united, could secure higher rates of charges. Notwithstanding the fact that bran had gone up 9d. a bag, and blacksmiths charged 6d. extra for shoeing horses, the charges had remained the same.—After further discussion, it was decided, on the motion of Mr. Treen, seconded by Mr. L. A. Pyrah, to appoint a committee to inquire from the Town Clerk or Chief Constable how matters stood with regard to the by-law, and report to the next meeting.

Hensol Castle, Glamorgan. — Extensive water supply and drainage works are being executed at this castle for Lady Price Fothergill. New farmhouses and repairs are also being carried out at a cost of over £4,000. Messrs. George Jennings, of Lambeth, are executing the water and drainage works, and Mr. W. A. James, of Cowbridge, is doing the remainder under the superintendence of Mr. C. B. Fowler, F.R.I.B.A., of Cardiff.

Engineering Notes.

Ludgate Hill Station is to be lighted with electricity.

Haslar Bridge, connecting Gosport with the Naval Hospital, Portsmouth, collapsed on November 1st, through a barge colliding with the main support.

Fifty Electric Tramcars for Leeds are to be supplied by Messrs. Dick, Kerr and Co., Ltd., London, whose tender amounted to £27,500, or £550 per car.

A Large Sum for Experimenting.—The London School Board are going to spend £5,000 upon experimenting with a new system of ventilation at a school now being built in the Hackney district.

Croydon Tramways.—The Corporation of Croydon, having purchased the tramways, have agreed to equip them on the overhead system of electric traction, and to lease the undertaking to the British Electric Traction Company, Limited.

Singular Electric Light Fatality.—A boy employed at the Cleveland Steel Works, Eston, Middlesbrough, recently fell asleep, and, on awaking, yawned and stretched out his arms. One of his hands came in contact with the electric lighting wires, and he was killed instantly.

Faversham to Maidstone.—The Earl of Jersey and Colonel Boughey, two of the Light Railway Commissioners, gave favourable consideration on November 2nd to an application for an order to construct a light railway from Faversham to Maidstone, at a cost of £87,000.

London Docks Improvements. — The entrance to the South-West India Dock is to be lengthened and deepened. The present lock is 300ft. long, and the depth available for the full width is 23ft. 6in. The lock will now be lengthened to 480ft., with three pairs of gates, and deepened to 29ft.

The Manchester Gas Explosion.—It was stated at the inquest on the body of Mr. Stevenson, the engineer, that the explosion at the municipal gasworks in Rochdale Road, Manchester, was caused by a naked light setting alight a stream of gas whilst a transfer was being made from an old to a new meter. Thirteen persons were injured. The clock tower is to be taken down.

Improvement Schemes at Heckmondwike.—On Thursday Mr. W. R. Slacke, one of the inspectors of the Local Government Board, held an inquiry at Heckmondwike into the District Council's application for sanction to borrow £19,260; £14,000 being for electric lighting plant, £3,438 in respect of public baths, £1,540 for the purchase of land as a site for public offices, and £282 for the erection of a fire station.

The Welsh Water Scheme Pronounced Unnecessary.—In his report to the Middlesex County Council, Sir Frederick Dixon-Hartland, Bart., M.P., the chairman of the Thames Conservancy Board, says that the system of intercommunication between the metropolitan water companies has proved that the Thames is capable of supplying the needs of London. When once the system of reservoirs adopted by Parliament is in working order, adds Sir Frederick, all pretence for saddling London with the enormous cost of bringing water from Wales will be absolutely unnecessary.

Liverpool Engineering Society. — The first meeting of the twenty-sixth session of the Liverpool Engineering Society was held on November 1st at the Royal Institution, Colquitt Street, when Mr. A. Bromley Holmes, M.I.C.E., delivered his presidential address. The present session, he said, being the last complete one of the nineteenth century, was especially appropriate for retrospection. The century had been more particularly distinguished for the discovery and development of inventions for the transmission of power in the form of electrical energy, and its distribution for mechanical and other purposes. He discussed the progress in the use of electricity in domestic service, in the hospital, telephonic communication, illumination, traction, manufactories, and other branches.

Electric Lighting at Dudley.—The Town Council desire to borrow £33,000 for electric lighting purposes, and £5,280 for municipal buildings. A Local Government Board inquiry has been held.

The Institute of Junior Engineers held their inaugural meeting at the Westminster Palace Hotel on Friday. Sir William H. White, the retiring president, received a hearty vote of thanks for the manner in which he had carried out his duties during the year, and he introduced Mr. Charles A. Parsons, the new president, and decorated him with a badge of office.

The Paignton Water Supply.—At their meeting on November 1st the Paignton District Council decided to proceed with their big water scheme. An effort was made to get the Local Government Board to consent to the Council proceeding without an Act of Parliament, but this failed, and the town will have to bear the expense of a special Act, as well as of the £40,000, or more, that the scheme will cost. The scheme comprises the purchase of 700 acres of land at Holne, and the construction there of a large reservoir. The only alternative was the securing of a supply from Torquay, but the Council unanimously preferred having an independent supply that will provide for all future developments. The consent of the ratepayers will have to be obtained at a statutory meeting before the Council can proceed.

Davos-Platz Funicular Railway. — A funicular railway up to the Schatzalp at Davos-Platz has just been completed. It commences at the rear of the Kurhaus, and is about 2,200ft. long. The force used to propel the cars is electricity, which is generated in the valley near the ice rink by dynamos driven by gas engines (an English patent), the mixture of air and gas being exploded not, as is usual, by a jet of gas, but by an electric spark. This is one of the first funiculars in Switzerland to use electricity as a motive power. The line cost more than double the price estimated—the amount expended being about half a million francs. The two Kurvereins of Davos-Platz and Davos-Dorf have just been amalgamated, the orchestras combined, an electric tramway is shortly to be inaugurated between Platz and Dorf, and in many ways a new epoch in the development of the resort seems to have been reached. The foundation stone has just been laid of a large German sanatorium, and another establishment of the same kind is in course of erection on the Schatzalp, and will be opened next year.

Rust in Iron Pipes.—Last week we briefly referred to the paper on "The Incrustation of Iron Pipes at the Torquay Waterworks," read before the Institution of Mechanical Engineers; we now give a few more particulars. The Torquay water mains lose 21 tons of iron every year owing to the action of the water passing through them. They would lose much more were it not for the special coatings that are placed on the pipes to preserve them. But there is no cause for alarm. Residents in Torquay are not drinking 21 tons of iron a year. The soft water from the moors in passing through the pipes draws out the iron, but does not absorb it into itself. Having drawn out the iron, it solidifies it again in the shape of rusty blisters all over the inside of the pipes. These blisters are always growing, and would in time completely block the pipes, but every year the entire length of the main is scraped. The largest main is only 10in. in diameter, so that men cannot go through to clear off the rusty blisters. The scraper is a strange-looking machine, nearly 4ft. long and 132lb. in weight, and was invented by Mr. W. Froude in 1873. It is placed in the main at the reservoirs, and is forced through the pipe by the weight of the water behind it. Seven men are employed to follow the scraper, the rush of which they can distinctly hear, and which, at times, travels at the rate of $7\frac{1}{2}$ miles an hour. The following of the scraper "o'er hill and dale" is said to be exciting. The flow of water through the mains after each scraping is increased by 28 per cent., and, of course, the diameter of the pipes is gradually growing. For instance, what was once a 10in. pipe is now $10\frac{1}{2}$in. in diameter.

Surveying and Sanitary Notes.

For Completing a Scheme of Sewerage for Aldridge, the Walsall Rural District Council seek to borrow £2,500.

Privies and Closets at Stourbridge.—The Sanitary and General Purposes Committee have been instructed to take steps to bring about the conversion of all privies into water closets during the next seven years, or earlier.

New Appointment.—The First Commissioner of Works has appointed Professor W. H. Corfield, M.D., of University College, Consulting Sanitary Adviser to the Office of Works for the Royal Palaces and Public Buildings in charge of the Department.

£15,520 for Sewage Purposes at Southend, £420 for public walks and pleasure, and £9,300 for the construction of works for the utilisation of sea water for sewer flushing, street watering, and other purposes, were asked for by the Council at a Local Government Board inquiry.

Sewage Works at Ranceby.—The Sleaford Urban District Council on Wednesday evening adopted a plan for the disposal of the sewage of the new County Asylum at Ranceby at an estimated cost of £960. Towards this sum the County Council have consented to contribute £500.

Wallasey Improvements. — The Local Government Board have intimated to the Wallasey District Council that they are not prepared to sanction a loan of £7,580 for the construction of a new road from Wallasey Village to the seashore. They have sanctioned the Council's application for borrowing powers for £10,000 for electric lighting purposes.

New Street in the City.—The opening of Lloyd's Avenue will form a connection between Fenchurch Street and Crutched Friars, and will give a direct line of communication between these thoroughfares and the Minories, the Tower Bridge, and the docks. The new street is 40ft. wide and 450ft. long, and has cost about £13,000, the Corporation having undertaken the construction of all the sewers, subways, and vaults beneath. The opening ceremony will be performed on November 11th by the new Lord Mayor.

Beautifying London.—At the meeting of the Metropolitan Public Gardens Association on November 2nd it was decided to offer to plant trees in various thoroughfares, and to support schemes for acquiring Albert Square, E., as a public garden, for the extension of Brockwell Park, and for converting the Latchmere Allotments, Battersea, into a public recreation ground. It was stated that the association had begun the laying out of the churchyard of St. Mary's, Plaistow, and that similar work would soon be commenced at Christ Church, Blackfriars.

Manchester and Salford Sanitary Association.—A meeting of the committee of this association was held at the offices, Brazenose Street, on Wednesday, Professor D. J. Leech in the chair. The issue of a new series of health publications was approved, and steps were authorised with a view to the holding of a Health Conference in Ancoats. On the suggestion of Mr. Horsfall, it was decided to memorialise the Government in favour of the appointment of a Royal Commission on Physical Training, and to invite all societies throughout the country likely to be interested in this important subject to co-operate.

Proposed New Sewage Works at Newcastle-under-Lyme.—At the last monthly meeting of the Corporation, the Sewage Works Committee presented a report stating that the sub-committee appointed for the purpose had visited the sewage works at Lichfield, Pelsall, Rushall, Walsall, and Malvern, and recommended the adoption of a complete scheme of coal-filter for the purification of the sewage of the borough, in accordance with a scheme submitted by Mr. J. Edward Willcox, of Birmingham. New sewage disposal works had been rendered necessary through the County Council complaining of the impurity of the effluent discharged from the present works. The cost of the new scheme, including payment of commission to Mr. Willcox, was put at £13,025. The recommendation was adopted.

Supposed Dick Turpin Tunnels.—On Wednesday last one of the Highgate Harriers was injured through a subsidence in the roadway; the cavity was about 6ft. wide and 15ft. deep. Upon examination it was found that the upper portion of a subterranean passage had collapsed, and, on tracing the course of this passage, another was discovered. The main tunnel, which is of considerable width, leads on the left to the Flask Tavern, in South Grove, close to St. Michael's Church, and on the right it is supposed to lead to the open fields near Caen Wood, the seat of the Earl of Mansfield. The Flask Tavern, a very old house, is popularly supposed to have been one of the haunts of Dick Turpin. The house has numerous and extensive cellars, with trapdoors leading from the rooms above, and close by is the stable which is said to have sheltered Black Bess. It is supposed that these subterranean passages were constructed in order to give a ready means of escape from the house in times of danger.

Trade and Craft.

A NEW PAINT.

Of recent years a great deal of attention has been given to the manufacture of paints, oils, and varnishes, and, as a result, numerous novelties have made their appearance. One of these is "Siderosthen" paint, which is made by the Siderosthen Paint Syndicate, Ltd., of Monier Road Works, Wick Lane, Bow, London, E. For this paint it is claimed that it will absolutely prevent the rusting of the material to which it is applied, that it will stand any degree of heat without blistering, that it will resist the action of chlorine, ammonia, caustic soda, and nitric, acetic, sulphuric and muriatic acids, that it is unaffected by salt air, spray or sea-water, and that it is elastic when dry and will not crack or chip. "Siderosthen" has the character of thin oil paint and is of a blue-black colour. According to some tests made with this paint, it was found that after being immersed in water for a year, a plate coated with it remained unchanged. An iron plate coated with it was, after drying for five days, exposed for two hours to a temperature of about 260deg. F.; the paint first softened and then became hard again. The plate was then immersed in a steam boiler heated up to 320 deg. F., and the paint was found to remain intact. It follows that "Siderosthen" can be used for painting steam boilers inside, and we understand it is found to be of great service in preventing formation of scale. Plates coated with it were unaffected after being subjected to acids and fumes for six months. A peculiar feature about the paint is that it dries from the inside outwards. Its covering capacity is three times that of red lead ($10\frac{1}{2}$gal. will cover 1,200 square yards, the cost being $\frac{1}{4}$d. per square yard). For railings, girders, woodwork in damp positions, iron casements, underground water pipes, and general sanitary work, it should prove of great value, as rust makes great havoc and causes much expense. About eighteen months ago "Siderosthen" was used for painting the girders at the west end of Westminster Bridge Station and has stood the sulphur fumes most satisfactorily. The Crown Agents for the Colonies, several leading railway companies, and numerous large firms throughout the country, are using it, so that the paint does not come before the public with unsupported claims. It will preserve wood from the ravages of white ants, which should make it specially suitable for the colonies, where these pests do so much damage. Where another colour than black is required, an isolating paint can be used in red or grey, over which linseed oil paint can be applied as a finishing coat. Linseed oil paint will not adhere directly to "Siderosthen."

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		BUILDING—		
Nov.	10	Rogerstone—Footbridge	Parish Council	T. Rees, Engineer, Corn Exchange-chmbrs., Newport, Mon.
,,	11	Keighley—Four Houses	....	W. H. and A. Sugden, Architects. Keighley.
,,	13	Stourton—Two Pairs of Cottages	....	— Shackleton, Estate Office, Stourton.
,,	13	Woolacombe, Devon—Detached Residence	G. C. Davie	G. C. S. Richards, 3, Castle-street Barnstaple.
,,	13	Beckenham—Two Foremen's Cottages, &c.	Urban District Council	J. A. Angell, Surveyor, Council's Offices, Beckenham.
,,	13	Leicester—Wholesale Market	Corporation	W. Brand, 16, Bishop-street, Leicester.
,,	13	Westbury-on-Severn—Tramp Wards, &c.	Union Guardians	W. F. Jones, 21, George-street, Gloucester.
,,	14	Woolwich—Public Library	Local Board of Health	Church, Quick & Whinsop, Architects, William-st., Woolwich.
,,	14	Exeter—Offices	Great Western Railway Company	Engineer, Great Western Rly. Station, Plymouth.
,,	14	Bath—Forty Dwellings	Urban Sanitary Authority	City Surveyor, Guildhall, Bath.
,,	14	Sandown, I. of W.—Higher Grade School	Brading School Board	J. Newman, Architect, "Thornton," Sandown.
,,	14	Battersea, S.W.—Two Dwellings	London County Council	Engineer's Department, County Hall, Spring-gardens, S.W.
,,	15	Westminster—Retaining Walls and Foundations for New Public Offices	Commissioners of H.M. Works and Public Buildings	Sir J. Taylor, H.M. Office of Works, Storey's-gate, S.W.
,,	15	Rhyl, Wales—School Buildings	Governors of Intermediate Schools	F. H. Shaylor, Architect. Belvoir House, Shrewsbury.
,,	16	Halifax—Chapel, &c., Extension	....	M. Hall, 29, Northgate, Halifax.
,,	18	Brymbo, Wales—Twelve Cottages	....	E. Jones, Beehive, Brymbo.
,,	20	Southampton—Workhouse Infirmary	Guardians	W.H. Mitchell, Son & Gutteridge, 9, Portland-st., Southampton.
,,	22	Cricklade, Wilts.—Police Station	Standing Joint Committee	C. S. Adye, County Surveyor, County Offices, Trowbridge.
,,	27	Londonderry—Enclosure Walls, &c.	Corporation	City Surveyor, Guildhall, Londonderry.
,,	29	Kidderminster—Abutments, &c., to Two Bridges	Town Council	A. Comber, Borough Engineer, Town Hall, Kidderminster.
Dec.	2	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
,,	11	Liverpool—Cottage Home School, &c.	Vestry	E. Kirby, 5, Cook-street, Liverpool.
Jan.	6	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Swindon, Wilts.
		ENGINEERING—		
Nov.	10	Pentre, Glamorgan—Gasifier	Rhondda Urban District Council	Medical Offices of Health, Council Offices, Pentre, Glam.
,,	10	East Retford—Machinery, &c., for Treating Sewage	Corporation	J. C. Melliss, 264, Gresham House, Old Broad-street, E.C.
,,	11	Latheronwheel, Caithness—Breakwater	County Council	J. Brims, County Clerk, Thurso.
,,	11	Warrington—Covered Concrete Service Reservoir	Corporation	J. Deas, Engineer, Bank House, Warrington.
,,	11	Swinton, near Manchester—Sludge-pressing Machinery	Urban District Council	T.S. McCallum, Trevelyan-bldgs, Corporation-st., Manchester.
,,	11	Glasgow—Pontoons, &c.	Corporation	J. M. Gale, 45, John-street, Glasgow.
,,	13	Leeds—Wiring Electric Lamps, &c.	Corporation	City Engineer, Municipal-buildings, Leeds.
,,	13	Llandudno—Gasholder	Urban District Council	E. P. Stephenson, Council's Engineer, Llandudno.
,,	13	Llandudno—Extension of Outfall	Urban District Council	E. P. Stephenson, Council's Engineer, Llandudno.
,,	13	Croydon—Electric Lighting Workhouse, &c.	Guardians	A. W. Sclater, 182, Oxford-street, London, W.
,,	14	Birkenhead—Electrical Plant	Corporation	W. Bates, Borough Electrical Engineer, Birkenhead.
,,	14	London, S.W.—Overhead Traveller in Engine House	London County Council	Engineer's Dept., County Hall, Spring Gardens, S.W.
,,	14	Birkenhead—Electric Motor-cars for Tramways	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
,,	14	Glasgow—Engines	Corporation	J. Young, 88, Renfield-street, Glasgow.
,,	14	Barry, Glamorgan—Gasholder and Tank	Urban District Council	F. M. Harris, Engineer, Gasworks, Barry.
,,	15	Fleetwood, Lancs.—Ferry Steamer	Urban District Council	J. Tildsley, Clerk, Town Hall, Fleetwood.
,,	15	Blackburn—Destructor	....	W. Stubbs, Borough Engineer, Blackburn.
,,	15	Hoylake, Cheshire—Electric Lighting	Urban District Council	T. L. Miller, 7, Tower-buildings N., Water-st., Liverpool.
,,	15	Bodmin—Water Supply Works	Rural District Council	W. J. Jenkins, Surveyor, Bodmin.
,,	15	Clacton-on-Sea—Laying Main, &c.	Urban District Council	J. Taylor, Sons & S. Crimp, 27, Great George-street, S.W.
,,	17	Leeds—Water Mains	Corporation	T. Hewson, City Engineer, Municipal Buildings, Leeds.
,,	17	Runcorn—Waterworks	Rural District Council	G. F. Ashton, 71, High-street, Runcorn.
,,	18	Ashby Woulds, Leics—Water Main	Urban District Council	G. H. Lilley, Town Hall, Ashby-de-la-Zouch.
,,	18	Perth—Iron and Steel Roofing	Gas Commissioners	A. Gillespie, 34, St. Enoch-square, Glasgow.
,,	20	Hull—Waterworks	Sculcoates Rural District Council	W. H. Wellsted, Engineer, Prince's Dock-chambers, Hull.
,,	22	Middlesbrough—Condensing Plant and Pipework	Electric Lighting Committee	R. Hammond, 64, Victoria-street, Westminster, S.W.
,,	27	Felsted, Essex—Electrical Plant	School Governors	O'Gorman & Cozens-Hardy, 66, Victoria-st., Westminster.
,,	29	Kidderminster—Two Steel Girder Bridges	Town Council	A. Comber, Borough Engineer, Town Hall, Kidderminster.
,,	30	Newcastle-upon-Tyne—Generators	Corporation	C. Hopkinson, 29, Princess-street, Manchester.
,,	30	Dornoch, Scotland—Light Railway	Highland Railway Company	W. Roberts, Company's Engineer-in-Chief, Inverness.
,,	30	Port Elizabeth—Railway	....	General Manager of Railways, Capetown.
Dec.	30	Panama—Aqueduct	Authorities	Commercial Department, Foreign Office, Whitehall, S.W.
,,	31	Porto Alegre—Electric	Municipality	Commercial Department, Foreign Office, Whitehall, S.W.
,,	31	Mistretta—Electric Lighting Town	Municipality	Commercial Department, Foreign Office, S.W.
Jan.	3	Concepcion—Drainage and Waterworks	Chilian Government	Commercial Department, Foreign Office, Whitehall, S.W.
,,	4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
No date.		London, S.E.—Hot Water Heating Apparatus	Licensed Victuallers' Schoo	G. Treacher, 73, Moorgate-street, E.C.
		IRON AND STEEL—		
Nov.	10	Great Yarmouth—Water Pipes, &c.	Urban Sanitary Authorities	J. W. Cockerill, Municipal-buildings, Great Yarmouth.
,,	10	Birmingham—Various Stores	Corporation	E. A. Lees, 44, Broad-street, Birmingham.
,,	11	London, E.C.—Railway Stores	Madras Railway Company	J. Byrne, 61, New Broad-street, E.C.
,,	13	London, E.C.—Railway Stores	Burma Railways Co., Ltd.	Offices, 78, Gresham-house, Old Broad-street, E.C.
,,	14	Amble—Cast-iron Pipes	Urban District Council	W. Gibson, 31, Queen-street, Amble.
,,	15	London, S.W.—Wrought-iron Tanks and C. I. Columns	Uganda Railway Committee	Crown Agents for the Colonies, Downing-street, S.W.
,,	15	London—Wrought-iron Hurdle Fencing	County Council	Parks Department, 9, Spring-gardens, S.W.
,,	20	Glasgow—Cast-iron Pipes	Corporation Electricity Department	Sir J. Marwick, Town Clerk, City-chambers, Glasgow.
,,	21	London, N.—Stores	London General Omnibus Co., Ltd.	R. T. Kingham, 235, Upper-street, Islington.
		PAINTING AND PLUMBING—		
Nov.	10	Birmingham—Lead Piping, Pig Lead, Paints, &c.	Corporation	E. A. Lees, 44, Broad-street, Birmingham.
,,	15	Manchester—Pipes, Baths, and Fittings	Baths Committee	City Surveyor, Town Hall, Manchester.
		ROADS AND CARTAGE—		
Nov.	11	Broadstairs—Flints	Town Council	L. A. Skinner, Clerk, Council Offices, Broadstairs.
,,	14	Southampton—Asphalting	Corporation	W. B. G. Bennett, Engineer, Municipal Offices, Southampton.
,,	14	Blackburn—Flagging, &c., Playgrounds	School Board	Cheers and Smith, 24, Richmond-terrace, Blackburn.
,,	15	London, N.—Road	....	Vigers and Co., 4, Frederick's-place, Old Jewry, E.C.
,,	18	Rugby—Improvement Works	Urban District Council	D. G. Macdonald, Surveyor, Rugby.
,,	21	London, S.W.—Three Motor Vans	Chelsea Vestry	T. W. E. Higgins, Surveyor, Town Hall, Chelsea.
,,	23	Eccles, Lancs.—Granite Setts, Paving, &c.	Highways Committee	A. C. Turley, Borough Surveyor, Town Hall, Eccles.
		SANITARY—		
Nov.	10	Darton, Yorks.—Sewerage Works	Urban District Council	W. H. Radford, Pelham-chambers, Angel-row, Nottingham.
,,	11	Kingsclere, Berks.—Drainage Works	Rural District Council	J. Barnes, Clerk, Kingsclere.
,,	11	Billericay, Essex—Stoneware Pipe Sewers, Sewage Disposal Works, &c.	Rural District Council	Bailey-Denton, Son and Lawford, Palace-chambers, 9, Bridge-street, Westminster.
,,	13	Nottingham—Earthenware Pipes and Drain Tiles	Stoke Farm Committee	A. Brown, City Engineer, Guildhall, Nottingham.
,,	13	Rawtenstall, Lancs.—Sewers	Highways and Sewering Committee	A. W. Lawson, Surveyor, Municipal Offices, Rawtenstall.
,,	15	Cuckfield, Sussex—Stoneware Pipe Sewers, &c.	Rural District Council	J. Mansergh, 5, Victoria-street, Westminster.
,,	15	Morecambe—Sewers &c.	Urban District Council	Beesley, Son and Nichols, 11, Victoria-st., Westminster, S.W.
,,	15	Halifax—Sewers	Highways Committee	E. R. S. Escott, Borough Engineer, Town Hall, Halifax.
,,	16	Dursley—Drainage Work at Workhouse	Guardians	J. G. Wenden, Clerk, Workhouse, Dursley.
,,	18	Rugby—Sewers	Urban District Council	D. G. Macdonald, Engineer to Council, Rugby.
Dec.	6	Morecambe—Sewerage Works	Urban District Council	Beesley, Son & Nicol, 11, Victoria-st., Westminster, S.W.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Nov.	14	Billericay—Additional Accommodation at Infectious Diseases Hospital.	....	C. E. Lewis, Clerk to Rural District Council, Brentwood, Essex.
,,	30	St. Agnes, Cornwall—Water Scheme	£25	J. Angwin, Clerk to Parochial Committee, St. Agnes.
,,	30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *via* New York.
Dec.	1	Bury, Lancs.—Infectious Diseases Hospital	£100, £50, £25	Borough Engineer, Corporation Offices, Bury.
,,	15	Lymm—Council Chamber and Offices	£25, £15	W. Mullard, Clerk to Urban District Council, Lymm.
Jan.	31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.

Property and Land Sales.

FREEHOLD BUILDING LAND to be LET on LEASE, or SOLD in PLOTS; fronting on main road, and close to golf links and Highgate Woods near Muswell Hill and East Finchley Stations. Liberal advances if required to responsible Builders.—For plans and particulars apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington Road, N. 13

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HIGH HOLBORN.—By direction of Board of Works for the St. Giles' District.—To clear the site.—The whole of the BUILDING MATERIALS comprised in the warehouses and premises at rear of 191 and 192, High Holborn, including tiles, roof and floor timbers, panelling, brickwork, lead and other metal, and usual fixtures and fittings up.

MESSRS. DOUGLAS YOUNG & CO. will SELL by AUCTION, on the PREMISES as above, on THURSDAY, 16th NOVEMBER, at ONE o'clock precisely. On view day previous.

Catalogues may be obtained of G. WALLACE, Esq., Engineer's Office, 197, High Holborn, or of the AUCTIONEERS, 51, Coleman-street, E.C.

TO BUILDERS AND OTHERS.
NETTLEBED, five miles from Henley-on-Thames, six miles from Wallingford, and ten from Reading.

MESSRS. SIMMONS & SONS have received instructions to SELL by AUCTION, at the CATHERINE WHEEL HOTEL, Henley-on-Thames, early in DECEMBER next (unless previously sold by private contract) the HOUSE, BUILDERS' YARDS, BUILDINGS, and OFFICES, situate in the High-street, Nettlebed, with a frontage thereto of nearly 350ft., together with the Goodwill of the business of a builder and contractor successfully carried on at Nettlebed by Mr. Edmund Holly (who is retiring from business) for the past twenty-five years.

Particulars and conditions of sale can be obtained in due course of Messrs. COOPER & SON, Solicitors, Henley-on-Thames, or of the AUCTIONEERS, Henley-on Thames, Reading and Basingstoke.

Building Site.—King's Road, Chelsea.

MESSRS. ROGERS, CHAPMAN, and THOMAS have received instructions to SELL by AUCTION, at the Mart, Tokenhouse-yard, E.C., on TUESDAY, NOVEMBER 21st, 1899, at Two o'clock precisely, the FREEHOLD BUILDING SITE upon which the two old-fashioned residences, formerly known as Box Farm, 148 and 150, King's-road, now stand at the corner of Markham-street, with a frontage to the main thoroughfare of 50ft. and an average depth of 85ft., comprising a superficial area of over 4,000ft., offering a favourable opportunity for the erection of a bank, block of flats with shops under, or any business requiring a prominent corner position, in an old-established and improving neighbourhood. Possession on completion.

Particulars, plan, conditions of sale may be obtained of Messrs. CHILD and CHILD, Solicitors, 12, Sloane-street, S.W.; Messrs. FREEMAN and SON, Solicitors, 7, Foster-lane, E.C.; the Mart, E.C.; and of the AUCTIONEERS, 78, Gloucester-road, South Kensington, S.W., and 50, Belgrave-road, South Belgravia, S.W.

SALE DAYS for the Year 1899.
Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, Nov. 16
Thursday, Nov. 23
Thursday, Dec. 7
Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

By EDWIN FOX and BOUSFIELD.
At the Auction Mart,
On WEDNESDAY, NOVEMBER 8th, at TWO o'clock, in Two Lots.
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Particulars at the Mart; of Messrs MORRELL and SON, Solicitors, Oxford; and Messrs. PAINES, BLYTH, and HUXTABLE, Solicitors, No. 14, St. Helen's-place, E.C.; and at Messrs. EDWIN FOX and BOUSFIELD'S Office, 99, Gresham-street, Bank, E.C.

R.I.B.A. EXAMS. PREPARATION, personally or by correspondence, in three, six, nine, or twelve months' courses. Architectural Lending Library. Special three months' finishing courses. — For full particulars apply to Messrs. HOWGATE and BOND, Associates R.I.B.A., Perchard House, 70, Gower-street, W.C. (close to the British Museum.

SANITARY INSPECTORS' EXAMINATIONS.—An Associate of the Sanitary Institute thoroughly PREPARES CANDIDATES for the above Exams. by correspondence; no books are required.—For particulars and testimonials apply, "Certified Coach," "Malabar," New Eltham, S.E. 4

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SAMUEL STEAD,
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Per foot super.	1in. square framed, two panel door …	0	6	0	1	1
Per foot super.	1in. bead butt, or moulded and square, two panel door	0	6½	0	1	1½
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Per foot super.	1¼in. bead butt and square	0	4	0	1	0
Per foot super.	1¼in. bead flush and square	0	5	0	1	1
Per foot super.	1¼in. moulded and square	0	6	0	1	1
Per foot super	1¼in. bead butt both sides	0	6½	0	1	1½
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Per foot super.	1¼in. stop chamfer and square …	0	6	0	1	1
Per foot super.	1½in. deal, square framed …	0	4	0	1	0
Per foot super.	1½in. bead butt and square	0	5	0	1	1
Per foot super.	1½in bead flush and square	0	6	0	1	2½
Per foot super.	1½in. moulded and square …	0	6	0	1	3
Per foot super.	1½in. bead butt both sides …	0	6½	0	1	3
Per foot super.	1½in. bead butt and bead flush	0	6½	0	1	4
Per foot super.	1½in. bead flush both sides	0	7½	0	1	4
Per foot super.	1½in. bead flush and moulded	0	8	0	1	5
Per foot super.	1½in. moulded both sides …	0	7	0	1	4
Per foot super.	1½in. moulded one side, bead butt other … …	0	7	0	1	4
Per foot super.	1½in. moulded one side, bead flush other … …	0	8	0	1	4½
Per foot super.	Any of above with raised panels, extra … …	0	1	0	0	1½
Per foot super.	Any of above with bolection mouldings, extra …	0	1	0	0	2
Per foot super.	Doors of any of above descriptions, but with three panels instead of two, should be priced extra to the above prices …	0	2	0	0	2

Two Panel Doors in Woods other than Deal.

Prices per foot superficial including all materials.

		Pitch Pine.		Sequoia.		Honduras Mahogany.		Walnut.		Teak.		Spanish or Cuba Mahogany.	
		s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Per foot super.	1in. 2-panel square framed doors …	1	2½	1	6	2	8	2	10	3	0	3	5
Per foot super	1in. 2-panel bead flush and square doors …	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super	1in. 2-panel moulded and square doors …	1	3½	1	7	2	11	3	1	3	3½	3	10
Per foot super.	1in. 2-panel moulded and bead flush doors …	1	5	1	8	3	1	3	3½	3	6	3	10
Per foot super.	1in. 2-panel bead flush both sides, doors …	1	5½	1	8½	3	1½	3	5	3	7½	4	2
Per foot super.	1¼in. 2-panel square framed doors …	1	4½	1	7	2	10½	3	1	3	4	3	9½
Per foot super.	1¼in. 2-panel bead flush and square doors …	1	5	1	8	3	1½	3	5	3	7½	4	2
Per foot super.	1¼in. 2-panel moulded and square doors …	1	5½	1	8	3	1½	3	5	3	5½	4	2½
Per foot super.	1¼in. 2-panel moulded and bead flush doors …	1	6	1	8	3	2½	3	5½	3	10	4	2½
Per foot super.	1¼in. 2-panel bead flush both sides doors …	1	8	1	10½	3	4	3	7	3	11	4	5½

FOUR-PANEL DOORS.

		Labour only.		All materials and labour.		
		s.	d.	£	s.	d.
Per foot super.	1in. deal, square framed …	0	3½	0	0	11
Per foot super.	1¼in. deal, square framed …	0	4	0	1	0
Per foot super.	1¼in. bead butt and square	0	4½	0	1	1
Per foot super.	1¼in. bead flush and square	0	5½	0	1	2
Per foot super.	1¼in. moulded and square	0	6½	0	1	2
Per foot super.	1¼in. bead butt both sides …	0	7	0	1	2½
Per foot super.	1¼in. bead butt and bead flush … … …	0	8	0	1	3
Per foot super	1¼in bead flush both sides	0	8½	0	1	3½
Per foot super.	1¼in. bead flush and moulded	0	8½	0	1	4
Per foot super.	1¼in. stop chamfered, and square … … …	0	6½	0	1	2
Per foot super	1½in. deal, square framed …	0	4½	0	1	1
Per foot super	1½in. bead butt and square …	0	5½	0	1	2
Per foot super.	1½in. bead flush and square	0	6½	0	1	3½
Per foot super.	1½in. moulded and square …	0	6½	0	1	4
Per foot super.	1½in. bead butt both sides	0	7	0	1	4
Per foot super.	1½in. bead, butt and bead flush	0	7	0	1	5
Per foot super.	1½in. bead flush both sides	0	8	0	1	5
Per foot super.	1½in. bead flush and moulded	0	8½	0	1	6
Per foot super.	1½in. chamfered both sides	0	7	0	1	2

		s.	d.	£	s.	d.
Per foot super.	1½in. stop chamfered and square … … …	0	7	0	1	3
Per foot super.	1½in. stop chamfered both sides … … …	0	7½	0	1	3½
Per foot super.	1½in. stop chamfered and moulded … …	0	7½	0	1	3½
Per foot super.	1½in. moulded both sides …	0	8	0	1	5
Per foot super.	Any of above with raised panels, extra … …	0	1	0	0	2
Per foot super.	Any of above with bolection mouldings, extra …	0	1½	0	0	2
Per foot super.	Any of above with upper panels quirk-moulded, extra …	0	1½	0	0	2
Per foot super.	2in. square framed doors …	0	5½	0	1	3
Per foot super	2in bead butt and square …	0	6	0	1	4
Per foot super.	2in. bead flush and square..	0	7	0	1	5
Per foot super.	2in. moulded and square …	0	7	0	1	5½
Per foot super	2in bead butt both sides …	0	7	0	1	5½
Per foot super.	2in. bead butt and bead flush	0	7½	0	1	5½
Per foot super.	2in. bead flush both sides …	0	8	0	1	7
Per foot super.	2in. bead flush and moulded	0	7½	0	1	8
Per foot super.	2in. chamfered both sides …	0	7½	0	1	3
Per foot super.	2in stop chamfered and square … … …	0	6½	0	1	4

THE FINEST COMPILATION OF BUILDERS' PRICES.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS.

November 15, 1899.
No. CCXLIX.

Effingham House,
Arundel Street,
Strand, W.C.

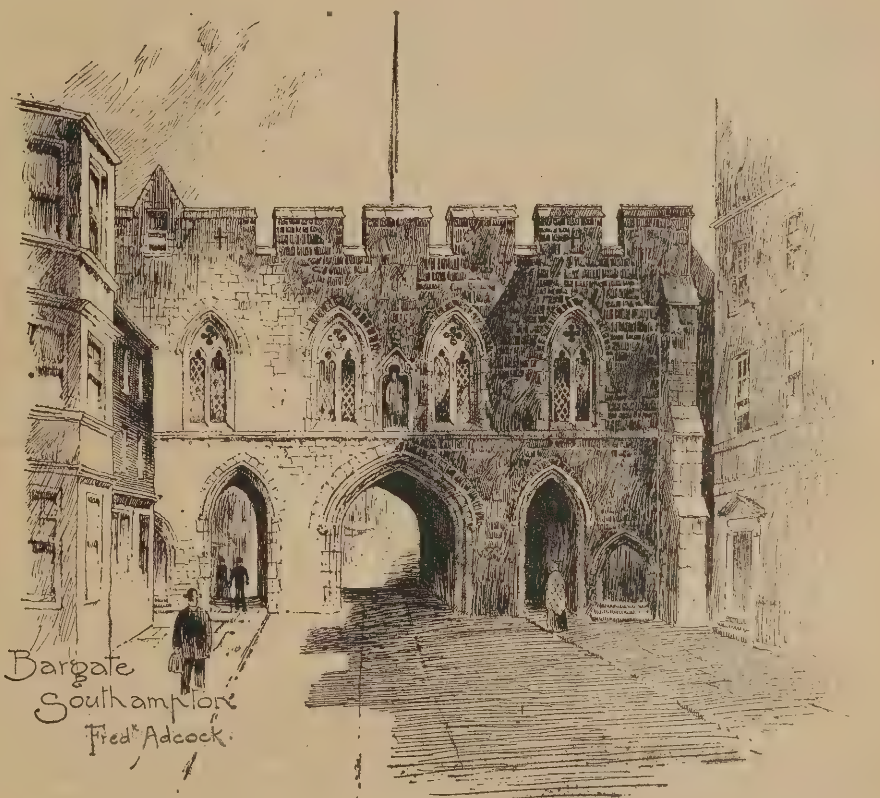
An Architectural Causerie.

The Study of Old Work. What is the object with which we study old work? Is our object to copy or to understand? Some people of course go so far as to say that old work should not be studied at all; yet their work often shows prominently the influence of the old masters, both in form and, still more, in spirit.

Of course, the obvious and natural idea of a Renaissance is that it should be an imitation of ancient work, not necessarily in defiance of new requirements, but still an imitation. Palladio measured Roman remains that he might reproduce the orders with their correct proportions in his own buildings. The architects of the fifteenth and sixteenth centuries did not trouble themselves very much about the purposes of ancient buildings, their origin, and developments; the imposing results were sufficient, and those they measured in order that they might copy. The same conception of ancient art comes out very clearly in old Italian collections of sculpture, such as that in the Vatican, especially if we compare them with a modern one, such as that in the British Museum. In the early collections judgment is given, so to speak, on results; the finest works are collected together in some "Tribune," irrespective of their style, or the date at which they were produced. In a modern gallery the works are arranged according to their dates or their schools. We are interested to see what influence each master owes to the one who went before. Old collections were for the instruction of artists and connoisseurs the more beautiful work was the one to study. Modern galleries are places rather for the historian of art; such a work inspired such another. Here we recognise the style of one school, here of a second; so a historical and scientific interest has come to qualify our sheer admiration of a work of art.

The conception that ancient buildings were so many storehouses of designs for modern ones went on gathering force right up to the Gothic revival, and the Gothicists inherited it in its full strength. Instead of measuring temples and baths they measured churches and halls, and reproduced them in their own work. But it was soon found out that mediæval buildings were not only beautiful and imitable, but intelligible and interesting; so that architects and antiquaries sought not only to know the buildings, but to know about them; when they were first put up, how altered, and what were the uses of the various parts. Modern archæology has reached enormous limits, so that there is hardly anything in the social and religious life of earlier ages which it does not touch. Among the many accomplishments that an architect is required by the public to possess, is a sound knowledge of archæology. And this was fair enough in the days when architecture was frankly an imitative art and archæology an acquaintance merely with the relics of antiquity. Of course, if an architect was to imitate it would be well for him to be familiar with the best models. But, now, though architecture may still be an imitative art—it is so regarded by the public at large, especially I think, by the cultivated part of it—the architect's old conception of archæology is quite antiquated. Research has shown the way to so wide a field that a mere acquaintance, however close, with features that we can copy hardly counts for archæology at all. Yet, is the architect to shut himself out from all this interest? Is he to refuse to trace the outline of a refectory on the site of an infirmary that he may devote himself to sketching Gothic windows on the cornices of Georgian houses? This is in fact the question which has puzzled our humble sketcher; in brief, is archæology any good to an architect? Everyone will answer this question in his own way. The writer's object is not to provide an answer to it, but to point out how mistaken is the notion that architecture and archæology are the same thing, even granting that architecture must depend for its inspiration upon the past. To those who admire as much as the writer the straightforwardness and simplicity which the mediæval builders show throughout their work, whether it be elaborate or plain, whether in the decoration or arrangement, it will be difficult to think that archæology is not of the greatest indirect value to an architect. But many people will think otherwise. Certainly its direct value is not obvious, and perhaps a single brain can hardly carry all the attainments which might have an indirect bearing on the practice of our art.

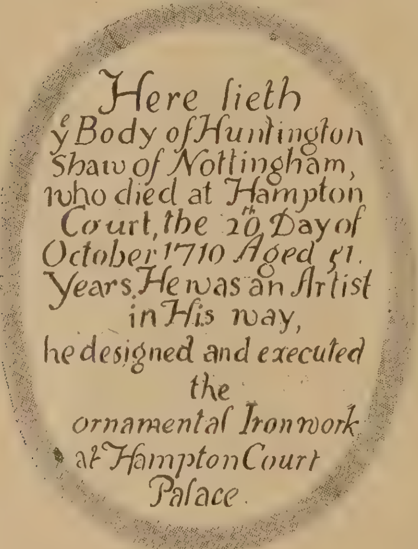
E. B. S. S.



Bargate, Southampton. The fine old gateway at Southhampton, which divides the High Street into two portions—Above and Below Bar—was formerly the northern limit of the town. It was at one time protected in front by a broad ditch; beyond this a "fore-gate" suburb sprung up, which has gradually become connected with the rest of the town. The lower stage of the gateway is composed of a central arch with a smaller one on each side. The central one appears to be of the early English period, but the smaller ones are of a later date. The upper storey on the south side, as shown in the illustration, has windows of the decorative period, which are a modern restoration to something like the appearance of the gateway before the "improvements" of the last century, when sash windows were inserted and the interior walls plastered. The statue in the niche above the central arch is of George III., attired as a Roman emperor; it replaces one of Queen Anne which has been moved to the interior of the building. The room over the archway has been used as a Court of Justice since the reign of Queen Elizabeth. In spite of the various alterations, this beautiful old gateway still remains one of the finest examples of the kind in England.

F. A.

"An Artist in his way." This is a phrase contemptuous alike of the artist and his work, of artistry and of the artistic career, a phrase whose implied slight, even unaccompanied by the intentionally offensive intonation, places the man so characterised as of little account among his fellows, and his calling as one to be sneered at, or patronised by every respectable tradesman. It is, in short, the phrase that fills the mouth of the estimable commercial man when he is discussing the artist in paint, in architecture, in sculpture—the artist, in fine, in all media; and it carries with it an undefined sense of superiority assumed by the user of it. It might, perhaps, be thought that this is a phrase of modern mintage; and indeed it carries a specious air of modernity that might be calculated to deceive the most expert in recent vulgarisms; but we have happened upon a relic which embodies it and proves that nearly two hundred years ago the Philistine flourished exceedingly. It is a relic interesting in itself and valuable as a text on which to hang this discourse. It may be found at Hampton-on-Thames, in the church, and is in the shape of an oval medallion on the wall, with the quaintly lettered inscription shown in the accompanying illustration. The name of Huntington Shaw is one familiar to the architectural profession, for, as this epitaph incorrectly tells us, he was long thought to be the designer of the beautiful wrought-iron gates at Hampton Court Palace as well as the craftsman who fashioned them. The belief that he designed these remarkable gates is now an exploded one, and a Frenchman, a certain Jean Tijou, a well-known designer of that period, is known to have been officially employed on such decorative details at the Palace. But if it is certain that to Jean Tijou's rich fancy we owe this florid design, it is also no less certain that it is to the skilful craftsmanship of Huntington Shaw we are indebted for the translation of the Frenchman's fancies into actual solid facts, in the stubborn medium of iron. He was, indeed, "an artist in his way," as his epitaph says, and much more an artist than that slighting form of words would seem to allow, even while crediting him with more than was his due. Art, you see, was even then in the ordinary mind commonly restricted to the category of painters. The great galleries of that riverside Palace were hung with the works of Old Masters and with those of contemporary painters. Those painters were men of very varied calibre, but they all employed brushes upon canvas, and so all were "artists." The walls and ceilings, too, of the Palace were even then being decorated with what Pope, or another, calls "The sprawling nymphs of Verrio and Laguerre," and Laguerre and Verrio, too, were "artists." Shaw, however, wrought at the forge, and smote and hammered iron, and was probably looked upon as little better than a kind of glorified blacksmith, so that even those who erected his memorial, and who cannot be accused of wilfully under-rating him, only conceived of that wonderful craftsman as by way of being of that dignified company. That, even nowadays, there are those who deny architecture as an art, is perhaps sufficient proof that, to the crowd, the most gifted of architects and decorators are only, at the utmost computation, "artists—in their way." C G. H.


Here lieth
y^e Body of Huntington
Shaw of Nottingham,
who died at Hampton
Court, the 20^{th} Day of
October 1710 Aged 51.
Years. He was an Artist
in His way,
he designed and executed
the
ornamental Ironwork
at Hampton Court
Palace

On Reflection.

The March of Engineering. Though one expects it from men in exalted professional positions, the manner in which the presidents of our great societies and institutions acquit themselves at their inaugural sessional meetings is highly satisfactory. They supply much food for thought, striking out now and again into new paths, and, as in the masterly address given this year by the president of the Royal Institute of British Architects, reviewing the work of the past—be it years or months—with the voice of authority and experience. The address which Sir Douglas Fox (the new president) recently delivered at the opening of the eighty-first session of the Institution of Civil Engineers was of this class. There was certainly much matter for thought. Though what our foreign friends say of us is largely due to old-time prejudices, accentuated by modern jealousies, it is impossible to deny that innovations meet with great opposition in this country. As Sir Douglas said with regard to electrical traction, lighting and power, while the development of these great utilities is here hedged in by legislature and encumbered by regulations and by-laws, in the United States, Germany, Switzerland, Japan, and even our colonies, electricity is so universally used that the comparison is very discouraging to us. See how we stand with regard to electric railways. What an exception they are in Great Britain. The Metropolitan and Metropolitan District Railways of London have only just begun to experiment on a question that has long been decided in America—that of the electrical haulage of heavy trains combined with rapid starting. After referring to the complete revolution in the sanitary engineering of towns and villages during the century, and to the present unsatisfactory state of the London water supply, Sir Douglas Fox emphasised the conclusion of Sir J. Wolfe Barry that the metropolis would have to form new thoroughfares and widen the existing ones. We have often decried in our columns the narrowness of some of the London main streets, and pointed out how glaringly insufficient they are for the great stream of traffic which passes over them. This is a subject which has been talked about for many years, but something will really have to be done shortly. The president is evidently not nervous about the future of gas, which, since the days when Murdoch startled the inhabitants of Redruth by employing it for house lighting, has made great progress. With the statement made by those who foresee the age when all the coal dug out of the earth will go into retorts to provide a source of heat or light, "so that there will be no more fogs and no more waste of useful by-products," some will no doubt disagree; for, when engineering is in a state of constant advance it is certainly hard to define what will be the condition of things in future years, and many theorists are zealous in emphasising that a new invention may upset all former axioms and definitions. Therefore, prophecy needs to limit its vision.

Looking Ahead. Still here is the vista of the future as set forth by Sir Douglas Fox:—"May we not look forward to a time when horses shall have given way to mechanical traction, avoiding offensive smell, reducing noise and wear and tear, and enabling asphalte pavement to be used throughout with cleanliness and safety; when the cooking and heating of the town shall be effected, if not electrically, at least from gasworks situated in the neighbourhood of the collieries; when the fog-producing marshes of the East shall be thoroughly drained and dried up; and when an efficient ventilation of sewers shall prevent the escape into the thoroughfares, especially in the higher parts of towns, of the foul gaseous emanations of the mighty sewage flow beneath." The present is, perhaps, a fitting opportunity to point out a matter which has often been greatly deplored by architects. Without exhibiting what might in any way be called jealousy, envy, or pettiness, is it not fair to ask why the newspaper press and the public (as a result) give so little attention to architecture and architects? Their work is of equal importance to that of the engineer, yet, as an example, see what space has been devoted, and what prominence given to the opening meeting of the Institution of Civil Engineers as compared with the opening of the Royal Institute of British Architects. Public applause is not what is asked for, but simply that attention which the architectural profession deserves, in order to show that it is, indeed, a great and a living force in the nation's life. Too long has the architect been left in the shade; it is high time that his position was more fully recognised.

A Word About Patents. Three thousand years ago the wise man said that of the making of many books there was no end, and his utterance may very well be employed with regard to the number of patents taken out at the present time. It is amazing to see the long list of patented inventions that are introduced yearly, and there is no doubt whatever that the supply is largely in excess of the demand. The greater number of those who take out patents are really not competent to do so. As the result of false and silly representations of tiny articles or simple devices having brought fortune to their inventors, thousands have been led to exercise their inventive faculty in the attempt to follow suit, and in the majority of cases it were far better, both for themselves and for everyone concerned (the patent agent excepted) that they had devoted their time to something more profitable. To come nearer home, look at the number of sash fasteners, water closets, windows, fireproof floors, saw guards, lock nuts—to mention just a few—for which patents are taken out every week. Thousands of building patents are lodged annually at the Patent Office, but how many of them ever come on the market, how many are of any real practical value? It is true that small inventions, requiring little prior art on the part of the inventor, have proved valuable, but it is also true that in lotteries someone receives a large sum for a small outlay; yet lotteries are recognised as demoralising influences. The same might be said of patents. The real inventor is he who first satisfies himself that there is a need for his invention, and who then makes a thorough search of all the devices of those who have preceded him; unless he does this he will probably find that his idea is valueless or that it has already been exploited by another. The American Government Commissioner of Patents forcibly pointed this out some time ago; he said "the valuable inventions are those which are the result of hard work, careful study, and experiment by those who have familiarised themselves with what others have done and with the real needs of the art. The careful student does not always produce inventions of value, but he is at least not likely to merely reinvent what is already known, what is already before the public, either adopted by the public or tested and thrown aside as worthless." This well considered and common sense advice should be taken to heart by the would-be inventor. A little of the leaven of experience, and a short acquaintance with the Patent Office records, with their stupendous list of inventions, would soon drive him away from the inventive field, or rid him of conceits and make him more fit to develop his idea.

WITH GREEK BUILDERS.

By JOHN A. MARSHALL.

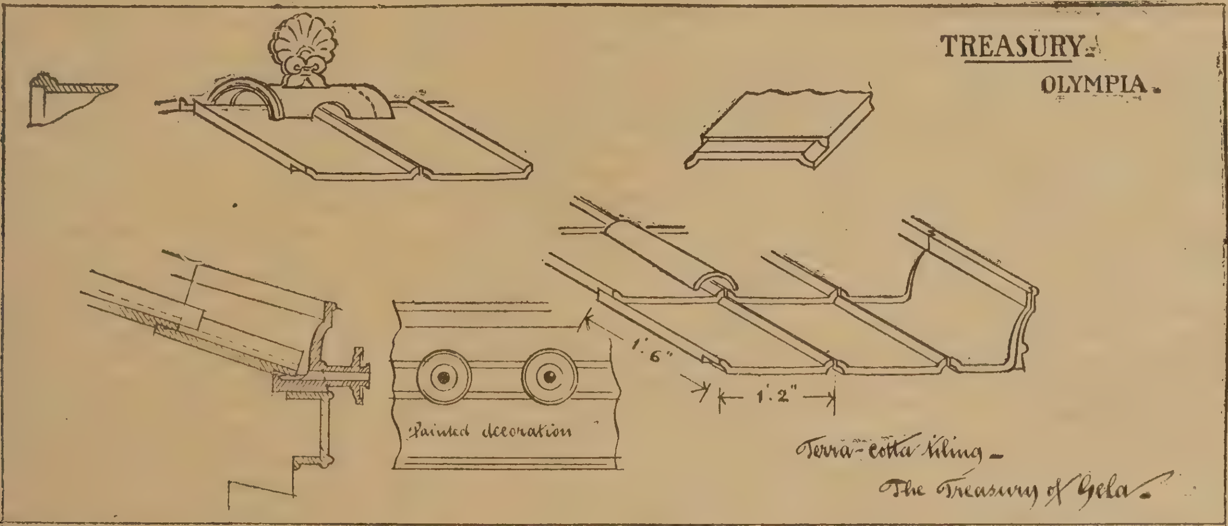
(*Concluded from page* 180, *No. CCXLVI.*)

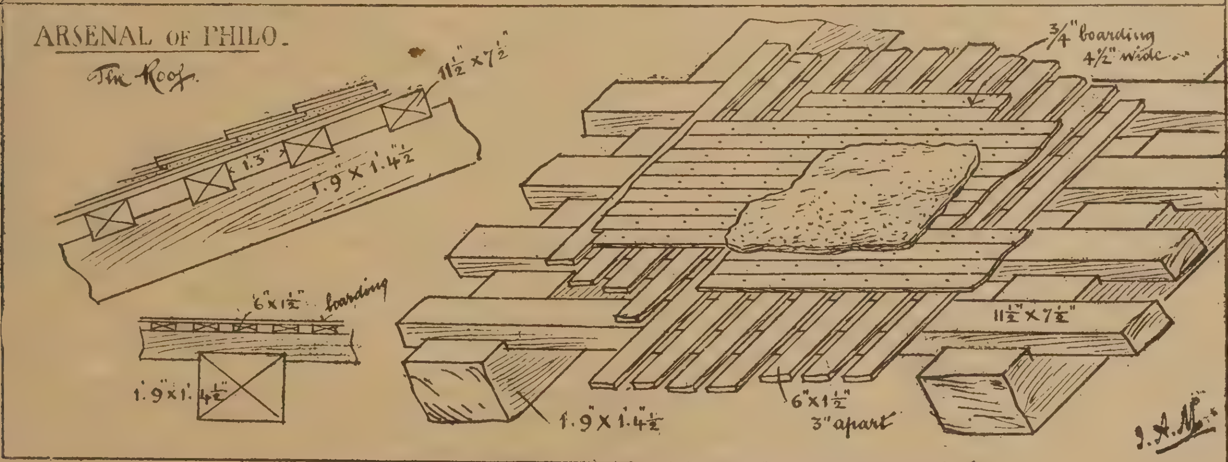
VII.—ROOFING TILES.

> "*At last he rose, and twitched his mantle blue;*
> *To-morrow to fresh woods and pastures new.*"
> —Milton.

HAVING now followed the various stages in the erection of a Greek temple, from the foundations to the cornice, it only remains to consider some of the general methods employed in the treatment of the roof tiling.

Until the early part of the sixth century, B.C., clay was probably the only material used for Greek tiles, and to make it impervious the terra-cotta was sometimes coated with a glaze. The invention of marble tiles not only increased the durability of the roof covering, but ensured a uniformity in the material employed throughout the exterior of the building; occasionally, however—from a motive of economy, or to limit the weight—the marble tiles were confined to the eaves and pediments, the rest being of burnt clay. In the islands of Naxos and Paros the making of marble tiles seems to have been a regular industry; the marble for the original tiling of the Temple of Zeus, at Olympia, came from one of these islands, but in Roman times it was replaced with tiles of Pentelic marble.





These were the tiles noted by Pausanias when he visited Olympia in the second century, A.D. After recording that the architect of the temple was Libon, a native of Elis, he points out, as worthy of note, that "the tiles on the roof are not of baked earth, but Pentelic marble, to imitate tiles." "They say," he continues, "that such tiles are the invention of a man of Naxos, named Byzes, who also made statues. This Byzes was a contemporary of Alyattes, the Lydian, and Astyages, the King of Persia." The marble from Naxos and Paros when in thin slabs is very translucent, and it has been suggested that this quality might have the advantage of causing the interior roof space to be fairly well lighted—assuming that the tiles were laid directly on the timbers without the intervention of boarding. In some cases it is certain that special provision was made either to light, ventilate, or gain access to the interior of the roof by perforating some of the tiles, and providing them with covers fitted over a curb or rim; such tiles have been found at Olympia, Phigaleia, Tegea, and Athens.

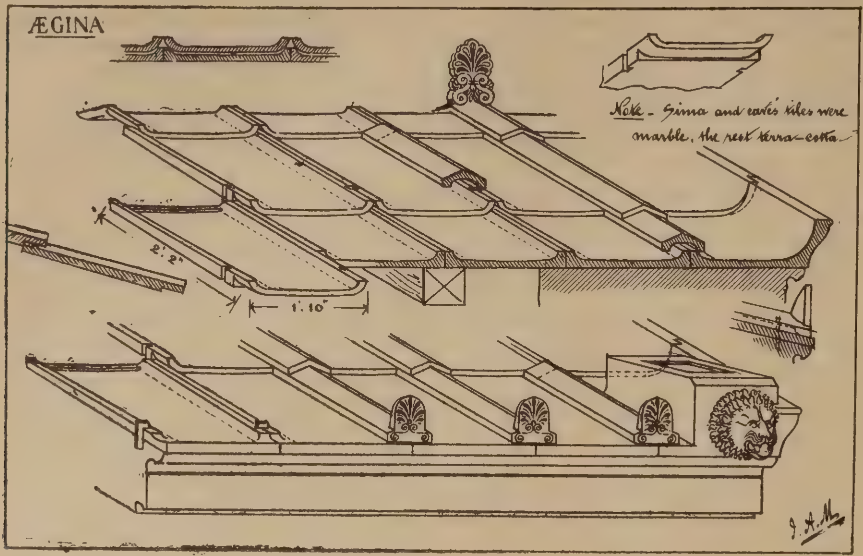
That the tiles did not always rest on the rafters is evident from the description of the roof given in the specification for the Arsenal at Zeia, in the Peiraic peninsula. It will be remembered that this building was divided into three aisles by two rows of columns; the columns were 11ft. from centre to centre, and 30ft. high; on the top of each colonnade were placed epistylia, or beams of timber, 2ft. 6in. wide and 2ft. 3in. high, each extending over two intercolumniations. Across the central avenue were tie beams of the same scantling as the epistylia. A propping block, 3ft. high and 1ft. 6in. square, was fixed in the middle of each tie beam, to support the principal rafters at the apex. These rafters were 1ft. 9in. wide and 1ft. 4½in. deep; they were secured to the ends of the tie beams with stout pins, and thence extended to the walls. On the principal rafters were placed longitudinal timbers, or purlins, 11½in. wide, 7½in. thick, and 1ft. 3in. apart; and on these, again, planks, or common rafters, 6in. wide, 1½in. thick, and 3in. apart. The rafters were covered with ¾in. boarding, nailed on in widths of 4½in., and on this was laid a preparation of some kind—perhaps loam or mortar. The roof is specified to be tiled with "Corinthian" tiles, fitting closely; these were probably of terra-cotta and bedded on the mortar.

There was no independent ceiling, and to light and ventilate the building a window was provided in each bay, and three at each end, 3ft. by 2ft., and fitted with bronze shutters; narrow openings were also left here and there at the vertical joints of the walling.

Respecting the bed of loam or mortar for the tiles, it may be mentioned that the German archæologists seem to have accepted this method as of general application, judging from the restorations in their work "Die Baudenkmäler von Olympia."

The Greek roofing tile may be briefly described as a shallow tray, with rims on two sides, to keep the water away from the joints as it runs down the roof. The underside was flat, excepting the overlapping part in front, which was shaped to fit closely over the rims and to the concave surface of the tile below; this part was also "throated," or undercut, to prevent the water being driven under, and as a further precaution, a slight roll or fillet was generally formed on the top surface of the tile, at the back, where it was overlapped by the "throated" portion of the tile above. To cover the joints at the sides, narrow tiles, saddle back in shape, were placed over the rims, and overlapped at the ends, like the rest of the tiling. When the eaves tiles included in their length two or three of the ordinary tiles, stops were worked on the eaves stones to receive the ends of the intermediate cover tiles; and in Doric buildings—where the sima was generally omitted on the flanks—the raised rims at the joints of the eaves stones were stopped short of the front edge, so that the antefixa, or anthemion, at the end of each cover tile could be bedded as a solid block, to conceal the rims, and be dowelled to the eaves stones; but if the eaves stones had a sima, which formed a gutter, as in Ionic buildings, then the cover tiles were shaped to fit the concavity of the gutter, and pass over the top edge of the sima, where they were terminated by antefixæ.

The question of how to finish the tiling on the pediments seems to have been solved at a very early period, as is shown by numerous


ÆGINA
Note - Sima and eaves tiles were marble, the rest terra-cotta.
2'. 2"
1'. 10"
J. A. M.

"archaic" fragments in terra-cotta which have been found from time to time.

The large size of the ordinary Greek tile rendered it necessary to conceal, in some way, the over-lapping at the verge, and this was done by turning up the thin outer edge of the tiles to form a deep sima; and in order to preserve a uniform width on the top edge, the over-lapping of the tiles was ingeniously merged into a rebate, so that the joints of the sima were "flush" on both sides. This elegant method of terminating the roof—as if the undulations of the tiling had culminated in a billow—lost, in the course of time, its refined character, and was eventually superseded by the ponderous coping stones of a later age. We will now follow our usual plan of briefly describing a few examples, which may serve to make the foregoing remarks a little clearer.

Treasury (*Olympia*).—An early example of terra-cotta tiling; size of tiles, 1ft. 6in. by 1ft. 2in. The rims of two contiguous tiles form a roll, which kept the water out of the joints. Where the tile overlapped it is rebated on the underside to catch the back of the lower tile, and thus was kept in position; the overlapping part is shaped to fit exactly into the tile below and over the rolls. The ridge tiles have socket joints at the ends, and a semi-circular opening in the middle of each side was provided for the insertion of the cover tiles; the latter were made tapering so that they could be more accurately fitted, and be less liable to slip. The sima of the eaves gutter had an outlet in the middle of each tile.

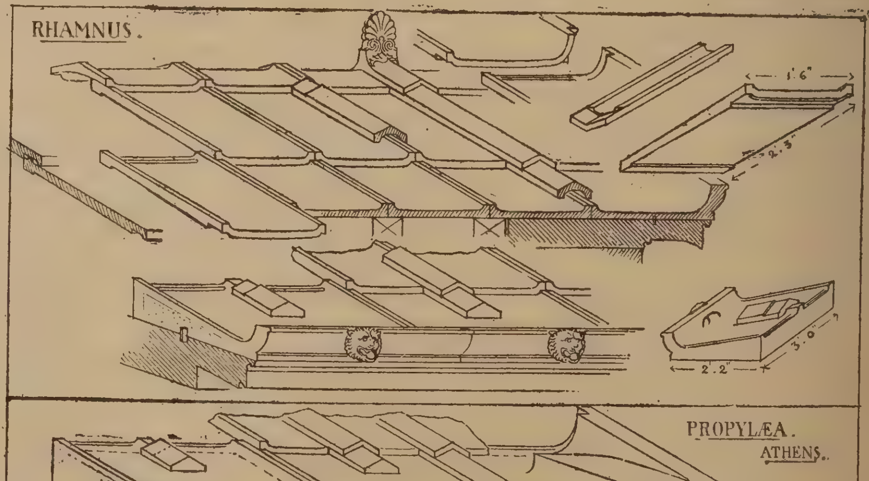
Aegina.—An instance of terra-cotta and marble tiling combined. The eaves tiles, with their cover tiles and antefixæ, also the sima tiles of the pediments, were of Parian marble; the rest of the tiling, including the ridge tiles, being of baked light yellow earth. Size of tiles, 2ft. 2in. by 1ft. 10in. The top surface is slightly concave, and the overlapping part on the underside is curved to fit into the lower tile; there is, apparently, no provision for fitting this part over the rims, and to get room for inserting the overlapping portion the trough of each tile is gradually widened towards the back by tapering the rims; even this expedient would not allow the tiles to fit very closely, but to prevent the water being driven under, a roll was formed at the back of each tile. The tiles were secured to the roof with iron dowels let into grooves formed in the sides, so that one dowel answered for two tiles; the dowels for the eaves tiles projected above the rims to secure, at the same time, the joint tiles and antefixæ. The rims of the eaves tiles stopped short of the front edge to allow the antefixæ to be properly bedded. The ridge tiles agreed with the ordinary tiling as regards the joints and overlapping parts.

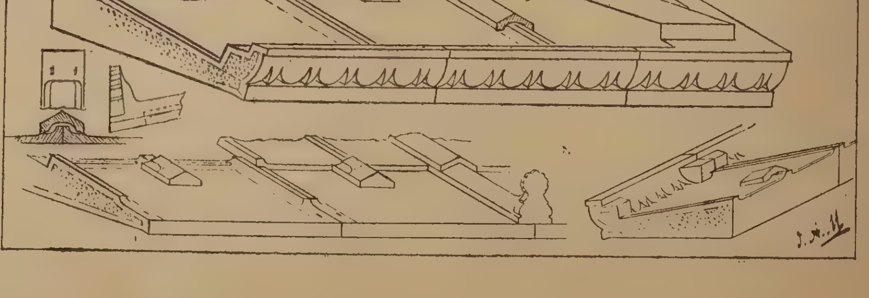
Rhamnus.—The tiling here was of marble throughout. Size of tiles 2ft. 3in. by 1ft. 6in. The front edge of each tile is formed into a throated drip, which passed over a roll at the back of the lower tile, and is shaped to fit into the trough and over the rims at the sides. A fillet at the back, on the underside, secured the tiles to the roof. The eaves tiles comprised two of the ordinary tiles, and the intermediate cover tiles were received by a solid block worked in the middle of each gutter stone. We cannot say how the cover stones over the joints were terminated, but we have seen them shown to abut against the back of the sima, in which case the joint would not be weather-tight.

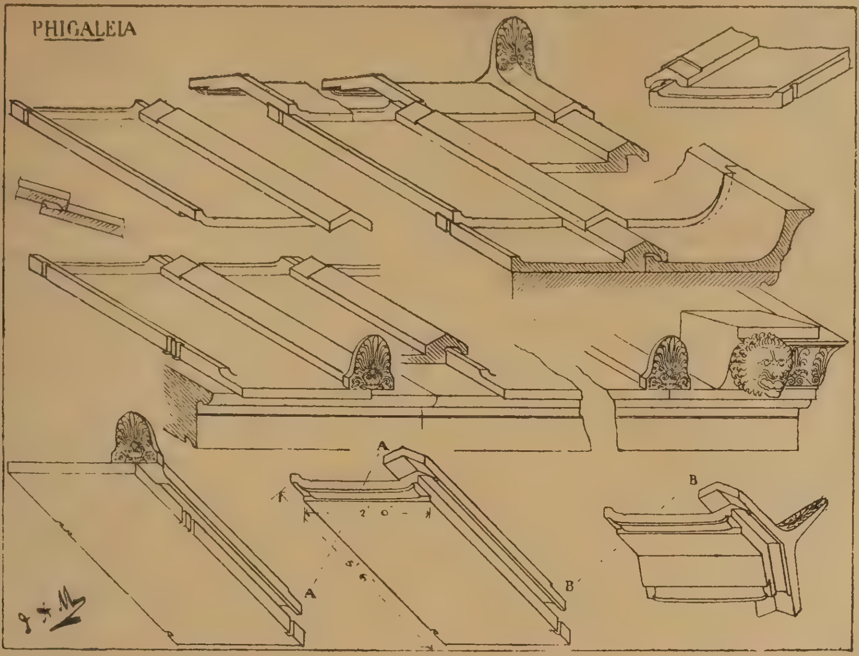
Propylæa.—The eaves of the main vestibules were treated in two ways; for the porticoes, as far as the breaks in the entablature, the eaves tiles were provided with a pierced sima, but for the intermediate portion of the flanks the sima was omitted. On each side of the joints, at the back of the sima, square blocks were left, perhaps to strengthen the sima or to serve as seatings for antefixæ, which may have been worked on the cover tiles. In other respects the arrangements are similar to some already described.

Phigaleia.—The fragments of tiles found on the site of this temple indicate, perhaps, the most perfect system of Greek tiling ever devised; at the same time it will be readily seen that the labour involved in its execution must have been unusually great. The tiles were very large (3ft. 6in. by 2ft. 1in.), and instead of working the covers in the ordinary way, on separate stones, they are worked on the same stones as the tiles. This arrangement would not only tend to make the roof more weather-tight, but it would add considerably to the strength of the tiles, not an unimportant matter, taking into account their excessive length. The ridge and eaves tiles, including their acroteria and antefixæ, were treated in the same manner. To secure the tiles to the roof, iron dowels were let into the sides, as at Aegina. Another instance of combination tiling was found at the Treasury of Sikyon, at Olympia, but here the arrangement was only applied to the eaves. In the "Phigaleian Room" of the British Museum the student may, by careful search, detect some tile fragments at the bottom of a case; and on the wall will be found a considerable length of the pedimental sima, exhibited in a horizontal position.

Ephesus.—Some fragments of tiles, encased in the "Ephesian Room," belong to the later temple of Diana; and could they be minutely examined, they would be found to possess many points of interest. On the wall of the same room are also the well-known fragments of the eaves gutter; the stones for the latter were about 6ft. in length, which probably comprised two of the ordinary tiles. The unusual height of the rims, dividing the gutter at the joints, leads to the conclusion that the gutter was turned up at the back to the height of the rims, so as to form a complete trough, and the first course of tiles would thus be raised some inches above the gutter. This conclusion is strengthened by the peculiar section of the "throated" drip on the first course of tiles, and which is clearly intended to project beyond a vertical face (A). The rims of the gutter stones were made sufficiently wide to receive the covers entirely free of the trough, and a secondary rim was worked on in continuation of the rims of the tiles (X). The cover tiles were, no doubt, turned over the sima, and terminated with antefixæ—indeed, the smooth, unweathered surface at the back of the sima, which was protected by the cover tile, can be traced. The intermediate cover tiles of the first course had "stopped ends," which finished flush with the front edge, and fitted closely to the rims (B). Another fragment (E) has a pad worked on the hollow of the rim, apparently with the object of providing a convex seating for the "stopped end" of the cover tile. The fragment C, which is in the "Archaic Room," has a stop worked on the rim a few inches from the front edge; this was evidently intended to receive a projection on the underside of the cover tile, with the







object of keeping the latter in position; on the fragment D such a projection will be found, and although it is not to be assumed that these two fragments were actually related, yet the principle of the expedient seems to be clearly established.

It will be noticed on fragment C that the rim is abruptly reduced in thickness on the outside, a few inches from the front edge, so that a space would be left between the tiles at this part; a similar peculiarity is also to be seen on some of the tiles found at Olympia, and the reason for it is made obvious by a peg which is worked on the underside of a cover tile (G) to fit into the slot and abut against the rebate.

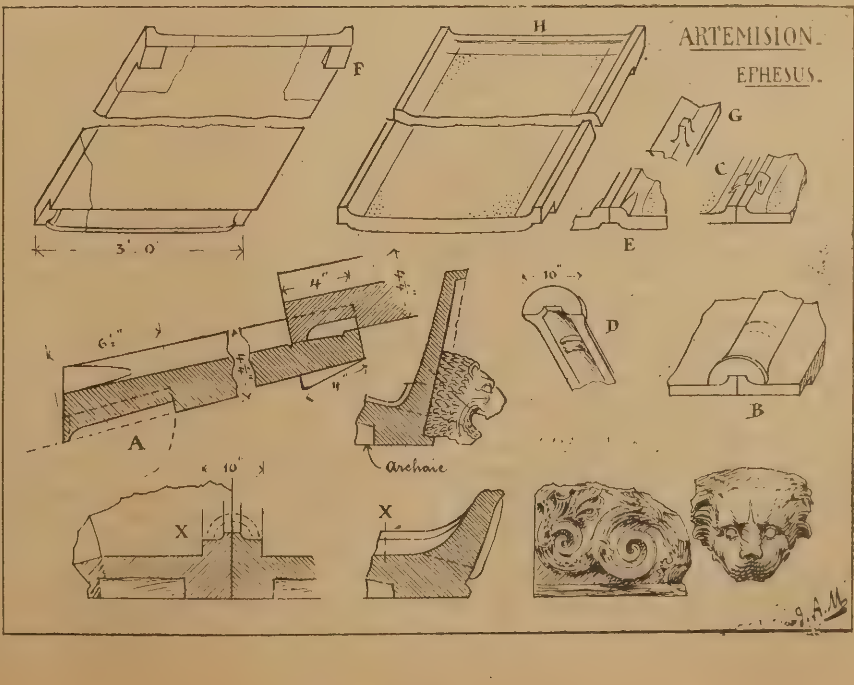
To keep the ordinary tiles from slipping projecting nibs (F) were left on the underside; and, to avoid unnecessary "cutting to waste" when working the tiles, the latter are reduced in thickness towards the back, so that the extreme thickness at the back, including the nibs, does not exceed the thickness in front. On the top surface at the back is an indent (H) to check the water when driven under the drips; the margins, which were protected by the cover tiles, are defined by an inscribed line, and still retain their polish, while the exposed surface is much water-worn.

In concluding this attempt to epitomise for students what is known of the structural qualities of Grecian Architecture, it will hardly be necessary to offer a note of warning against any attempt to revive in these days the details of this architecture; such a course would be quite out of place and distinctly detrimental.

In what way then, it may be asked, can the contemplation of Hellenic art advance the progress of the Modern? For an answer the words of a great writer need only be quoted: "It is the grace of the Greeks, their sense of proportion, their distaste for the exaggerated, their exquisite propriety; it is these that we should endeavour to assimilate without the loss of our own individuality. We should quicken our sense of form by intelligent sympathy with theirs, and not stiffen it into formalism by a servile surrender of what is genuine in us to what *was* genuine in them." To the same effect are the following lines of Goethe's, which he ascribes to that pert rogue Amor, who had followed him to Italy:

Hast thou a mind again to form? The school of the Grecians
Still remains open, my friend; years have not barr'd up its doors.
I, the teacher, am ever young, and love all the youthful,
Love not the subtle and old; Mother, observe what I say;
Still was new the Antique, when yonder blest ones were living;
Happily live,—and, in thee, ages long vanished will live!

H H



DISPUTED POINTS UNDER THE LONDON BUILDING ACT.

By GEORGE H. BLAGROVE,

Certificated Surveyor under the Act; Author of "Dangerous Structures," "Shoring and its Application," &c.

(Continued from page 178, No. CCXLVI.)

V.—CONSTRUCTION OF WALLS.

THE Act does not appear to contain any specific definition of the term "wall." It may be inferred, however, from the general tenor of the first schedule that a "wall" within the meaning of the Act cannot be less than 8½in. thick. In the "Preliminary" part of the First Schedule we read (8) that "walls are deemed to be divided into distinct lengths by return walls, and the length of every wall is measured from the centre of one return wall to the centre of another, provided that such return walls are external, party, or cross-walls of the thickness required, &c." It is evident that external walls can be divided into lengths by other external walls at right angles to them, but I know of nothing in the Act to define the lengths of these other external walls. Suppose, for example, that a building, facing the south, has a frontage of 80ft., and that half of its frontage coincides with the general building line, while the other half is set back 10ft. towards the north. The front external wall is thus divided into two distinct lengths by a return external wall about 10ft. long; or, more correctly, here are two distinct walls connected by a return wall, which forms an efficient buttress to each. But if this return wall were less than 10ft. long, it would form a less efficient buttress; it might be only 9in. long—there is nothing, apparently, in the Act to define its length. If the whole 80ft. front wall had only a 4½in. kink in the middle of its length, would this suffice to make it two separate walls for purposes of the Act, or must it then have the additional thickness required for walls exceeding 45ft. in length? Some surveyors hold that a wall in such circumstances is divided into two distinct lengths only when the outer face of the part set back is not in advance of the inner face of the other part. It is to be wished that we had some more definite rule for our guidance.

What is a Cross Wall?

External and party walls may be divided into distinct lengths by cross walls. Section 5 (17) defines a cross wall as "a wall used or constructed to be used in any part of its height as an inner wall of a building for separation of one part from another part of the building, that building being wholly in, or being constructed or adapted to be wholly in, one occupation." It does not appear that this separation is intended to be anything resembling a party separation; for we read, under the "Miscellaneous" part of the First Schedule, that a cross wall may have openings in it. But what is meant by the "separation of one part from another part of the building?" I have known a district surveyor allow a wall to rank as a cross wall when it was bonded to one external wall and extended far enough across the building to separate two rooms. He said that such a wall fulfilled the intention of the Act by forming an efficient buttress. Another district surveyor has maintained that a cross wall must extend across the entire building, being bonded to a party or external wall at each end. Personally, I prefer the latter view, as more correctly representing what appears to be the intention of the Act, which is to provide a means of separation, both for the purpose of a buttress, and for protection against the spread of fire. But it is to be regretted that there should be any scope for divergence of opinions upon this point.

Recesses in External Walls.

Under Section 54 (2), recesses in party walls are limited to one-half the area of the wall in the storey where they occur; and they are not permissible within 13½in. of the inner face of the external walls; moreover, they must have 13in. backs, and must be arched over where they exceed 5in. in depth. So far the stability of party walls is carefully protected under the Act. But in the case of external walls, which would seem to require more protection, both on account of their being liable to be pierced with openings, and being sustained by floors on one side only, less protection is provided under the Act. Indeed, there is nothing in Section 54, apparently, to prevent an external wall being reduced to 9in. thick for nearly an entire storey. Fireplaces in party walls must, under Section 64 (10), have 8½in. backs, but no definite thickness is provided for the backs of fireplaces in external walls. This is a point which has been frequently disputed between district surveyors and speculating builders of the "jerry" type, the latter delighting in 4½in. backs to fireplaces in external walls. In the absence of any special provision it has always seemed to me that such fireplaces should be treated under the rule in Section 54 (1) (*a*), relating to recessess, and a 9in. back should be insisted upon, in the interests of the public.

External Walls One Brick Thick to any Height.

Subject to certain conditions, it is possible to erect a building of any height, up to 80ft. from the ground to the top of the external walls, such walls being not more than one brick thick. The "Preliminary" part of the First Schedule (7) provides that the height of a wall, for the purpose of determining its thickness, shall be measured from its base; and Section 5 (10) defines the base of a wall carried upon a bressummer as the underside of the course above such bressummer. All that is needed then is first to provide such piers or other supports for bressummers as are required under Section 56 (1), and we may build each storey with its own 9in. external wall carried upon a bressummer at each floor, provided that no storey exceeds 10ft. in height from floor to ceiling. [See First Schedule, Part I. (11)]. I have heard it objected that this method of construction would not be permissible, on the ground that it would defeat the intention of the Act; but I do not think that such objection could be sustained.

Stanchions Built into Walls.

Bearing in mind the great value of space in modern buildings, it is not surprising that architects should seek to economise it by building stanchions into walls. Much can be said in favour of this practice. A stanchion so built in has a buttress on each side of it, which helps to resist any tendency it may have to move in the longitudinal direction of the wall; and, at the same time, the brickwork around it affords protection against the action of fire. But, at the same time, the building-in of the stanchion interrupts the bond of the wall, and tends to impair the wall's efficiency as a tie. I have known several cases in which district surveyors have disputed the right to build stanchions into party, external, or even cross walls. In one instance, a cross wall, extending through the middle of a building from side to side, had the effect of dividing the party walls on each side into lengths of less than 45ft. It was proposed to build stanchions into chases to be formed in the cross wall. The district surveyor objected, basing his objection mainly upon the second paragraph of the "Preliminary" part of the First Schedule:—"Every wall constructed of brick, stone, or other similar substances shall be properly bonded, and solidly put together, &c." On the other hand it was urged that, although the Act contained regulations as to chases in party walls, there were no restrictions as to chases in external or cross walls, and stanchions could be placed in such chases without any infringement of the Act. But the district surveyor maintained that the proposed chases would impair the efficiency of the cross wall as a tie, and that, if the proposed construction was adopted, he would so far consider the cross wall non-effective as to regard the party walls as exceeding 45ft. in length, and as requiring the extra thickness required for such walls, under the First Schedule.

It does not appear that any such objection as the foregoing could have been sustained against placing stanchions in chases in a party wall, provided that such chases, in accordance with Section 60, were not wider than 14in. nor deeper than 4½in., were not nearer than 7ft. apart, nor within 13in. of an external wall; and provided, also, that the stanchions did not support girders carrying walls. Such girders would come within the rules as to bressummers, which have been a fruitful source of disputes and difficulties.

Rules as to Bressummers.

Under Section 56 (1), "every bressummer, whether of wood or metal, shall have a bearing in the direction of its length of four inches at least at each end upon a sufficient pier of brick or stone, or upon a timber or iron storey-post, fixed on a solid foundation, in addition to its bearing upon any party wall or external wall, &c." Remembering that a bressummer is defined, under Section 5 (7), as "a wooden beam or metallic girder which carries a wall," we see that when such a girder bears partly upon a party or external wall, space cannot be economised by recessing a stanchion beneath it into the wall. I have heard it contended that when such a girder bears wholly upon a stanchion which is chased into a party wall, it does not actually bear upon the wall, and that therefore the extra 4in. of support required under Section 56 (1) cannot be demanded. But even here, and in all similar cases, the district surveyor has the whip-hand of the builder; for the section quoted provides that "the district surveyor shall have power in his discretion to require that every bressummer shall have such other storey-posts, iron columns, stanchions, or piers of brick or stone, or corbels, as may be sufficient to carry the superstructure."

Most architects and builders have had experiences enabling them to realise how vexatious the rules as to bressummers may become, if strictly enforced upon all occasions, especially when small alterations are being carried out. It is perhaps to be regretted that Section 56 (1) does not leave more to the discretion of the district surveyor. It seems absurd to build projecting piers under the ends of every rolled joist that is placed in a party or external wall to carry a few yards of brickwork. I have known one district surveyor state that he thought the rule only applicable to girders carrying such walls as are specifically dealt with under the Act, such as external or cross walls, and that in the case of a mere partition wall he would not enforce the rule, unless the girder actually required the additional support. Another district surveyor has been known to state that he did not always apply the rule, even in the case of a girder carrying an external wall, because of the hardships and anomalies frequently resulting from such a rigid enforcement of the Act.

In the construction of shop premises, the space in the front part of the ground storey, where the shop window is formed, is, of course, of the utmost value, and builders are usually desirous to recess the stanchions which support the shop-girder back into the party walls. Chases in such portions of a party wall are, of course, not permissible under the Act; and I have known a district surveyor maintain that the party walls must be built to their full thickness as far as the frontage line, in order that they may fulfil their purpose as dividing walls between adjoining premises, and that stanchions to support shop-girders must be placed against the inner faces of the walls, and not recessed into them. This view appears to me quite in accord with the intention of the Act, although it is far from commending itself to the approval of most persons who build shops.

(*To be continued.*)

George Eliot's House, "The Priory," St. John's Wood, N.W., is about to be demolished to make room for the enlargement of the electric lighting station.

Correspondence.

"GARDEN CITY": AN ARCHITECT'S CRITICISM.

To the Editor of THE BUILDERS' JOURNAL.

TUNBRIDGE WELLS.

SIR,—In your issues of October 5th and November 1st, you called attention to an association recently formed to educate the general public up to the point of founding an ideal city, and in the former notice you reproduce a plan given in Mr. Howard's book "To-morrow," which purports to be a plan such as he would conceive an ideal city might possess. Perhaps you may be able to find room for a few remarks upon the scheme from an architect's point of view, although I would preface my remarks by saying that since reading your notices I have heard Mr. Howard lecture on his scheme and in reply to criticism he seems very ready to admit that his plan is capable of a good deal of improvement. Still, if a man or an association are appealing to the general public to support a particular movement and publish a plan of something they would like to attain, one cannot be blamed for pointing out its weak points.

In the first place I would call your readers' attention to the circular arrangement of the scheme. Leaving out of consideration the improbability of finding in this country a track of sufficiently level country on which a circular city might be laid, it must be obvious to any architect that the objections to a circular as distinct from a rectangular system of laying out a town are very numerous. Anyone who has had the misfortune to live in a crescent will know the objections to houses built on a curve—objections both æsthetic and practical.

It seems to be a natural law that our senses are not capable of taking in an unlimited number of circular lines in a perspective. The materials of building are of such a rigid and inelastic nature that we instinctively feel that all the main lines of our Architecture should be either vertical or horizontal. While we can tolerate or even enjoy the sweeping lines of a dome, or the oblique lines of a roof or buttress, knowing their purpose and fitness, any attempt to multiply the curves of a plan produce a feeling of uneasiness, not to say nausea. The quadrant in Regent Street is an example of a street laid out on the curvilinear plan, which, however inoffensive it may be with all its houses of one pattern, would have been very unsatisfactory if each house had had a separate owner and architect. But when it comes to the practical side of the question, think of the uncomfortable rooms you get when they are rhomboidal in shape, or with curving walls; of the increased cost of building on the curve, of laying drains or sewers along a bending road.

But there is a more important consideration even than appearance. You do not need to be reminded that in laying out streets it is desirable, in order that each house may get its maximum of sunlight, that the street should run as far as convenient in the direction of north and south. It is obvious from a glance at Mr. Howard's plan that only a very few streets in the whole city of concentric rings would have that direction. Allowing, however, for a moment the circular idea, does it not strike you that Mr. Howard's plan wants turning inside out? The Grand Avenue is intended for the larger residences, a magnificent thoroughfare, but I notice it is surrounded at a distance of only 200 yards with a cordon of railways, factories, and workshops, with their endless noise and dirt and smell. The inhabitants of the city would be like a beleagued garrison, open on every side to the attacks of gas fumes, factory noises, engine shrieks, and chimney smoke; never able to escape and gradually driven in upon their central park to stifle. Looked at from the outside at any rate it could never be a beautiful city, and its central parks and gardens could never flourish properly, invested as they would be with this formidable army, nearly four miles in circumference, of smoke producers. But is it one of the essentials of a successful commercial and industrial community that traders and workers should all be in touch with one another, not only connected by railway and telephone but actually near one another? It should surely be a first consideration to concentrate the commercial portion of the town. The more the warehouses, factories, offices, and business premises are concentrated the better it is for trade and the more convenient it is for the general public. And the natural desire to leave the business at the close of the day, and escape in all directions into the surrounding open country should not be despised. Besides which the expansion of a town must necessarily be from the centre outwards and not the reverse, and while the smaller zone of business premises increases slowly, the larger zone of homes increases faster and faster as the prosperity of the community advances. Not that I disapprove of the central open space. By all means in a brand new city leave a big square in the middle like La Grande Place of Bruges, and abutting on that square put all the best public buildings, the town hall, the post office, the fire station, the police court, the exchange, the cathedral, in short, all that represent the serious side of public life. The halls of pleasure and the shops might perhaps be relegated to a secondary position. In Mr. Howard's plan the hospital is placed centrally, in the public park, quietly situated as is right, but it happens to be a mile or more away from every place where an accident is likely to occur, namely, in the industrial part of the town. The central square would, of course, be useful as a meeting place, for civil ceremony and festival, the centre of municipal life. It might be beautified by trees, but certainly should not be a garden. The gardens should be where we can have leisure to enjoy them. But above all, a city scientifically planned might take warning from London and almost every large town and take its railway right home to its heart. To stop the railway on the fringe is surely a mistake. The ideal city should have its railway station close to the centre, from which should radiate a good system of electrically driven cars.

These are some of the criticisms which occur to me in looking at Mr. Howard's plan. But it seems to me that if, as your article announces in bold headlines, we are to have "an ideal city made practicable," we should have some better notion of what an ideal city should be. The idea is and always has been a fascinating one to architects. To have a hand in building an ideal city where the irresponsible speculator and the restricted site and the ground landlord and absurd building by-laws do not exist; where the Philistine ceases from troubling, and the artist may be at rest, is one of our dearest *chateaux en Espagne*. It is heartrending to feel how hopeless we are at present to stem the tide of "uglyfication" which is spreading over the face of the land. Just recently in this country town, famous for its natural beauties, a large wood has been eaten up by the speculator. If Mr. Howard and his influential Association do not succeed in creating a new garden city, but only lead public opinion in the direction of preserving what garden character there may already be in our cities and towns, they will have earned our undying gratitude.—Yours faithfully,

C. H. STRANGE, A.R.I.B.A.

RUSKIN SOCIETY.

To the Editor of The Builders' Journal.

Brondesbury, N.W.

Sir,—Can any of your readers inform me if there is a "Ruskin Society" in London. If so, what are it objects?—Yours truly,

SEVEN LAMPS.

We do not know any such society.

LEASEHOLDERS' NATIONAL COMMITTEE.

To the Editor of The Builders' Journal.

Finchley Road, Hampstead, N.W.

Sir,—The iniquities of the terminable building lease (the foster-parent of jerry building and insanitation) are so flagrant, and the control by the "dead hand," and by non-resident landlords, over the restrictive covenants in leases so unjust, that a "Leaseholders' National Committee" has been formed with the object of obtaining Parliamentary legislation to enable:—(1) Short building leases to be converted into perpetual leases on equitable conditions (such as by a slight increase on the annual ground rent) in order to uproot "jerry building" and kindred evils; (2) Holders of terminable leases to remove their buildings at the expiration thereof, or to sell them to the landlord at an official valuation; (3) The power of the "dead hand" of absentee landlords, and of arbitrary agents, over restrictive covenants in leases to be removed, and the control and revision thereof to be transferred to a "committee of survey," selected from the local county council—the duly chosen representatives of those living in the district, who are alone rightly interested in the arrangement and use of its streets and houses; (4) Landlords to be restrained from appropriating at the end of the lease the goodwill of the business, created or purchased by the tenant, and to secure to the tenant the free sale thereof. It is desired to obtain local committees, of not less than twenty members, in every constituency of England, Wales, Scotland, and Ireland, in order that united action may influence every Parliamentary and municipal election until the above reasonable and urgently needed reforms are conceeded. There is not any fee or payment of any kind required for membership. Full particulars and membership cards will be sent, post free, to any part of the United Kingdom on written application, by letter or post-card, to—Yours truly,

JAMES HAYSMAN, *President,*
"Leaseholders' and Traders' National Union."

Obituary.

Sir Thomas Newenham Deane died rather suddenly on Wednesday last at his office in Dublin. He was born in 1830, and was the son of the late Sir Thomas Deane, architect, of Dundanion, Co. Cork, and was for many years the head of one of the most eminent firms of architects in Ireland. He was a member of the Royal Hibernian Academy, a member of the Institution of Civil Engineers, curator of the National Monuments of Ireland and Ancient Monuments under Sir John Lubbock's Act, and lecturer in Architecture to the Science and Art Department in Dublin. Sir Thomas Deane was the architect of several fine public buildings in Dublin, and took part in the restoration of Christ Church Cathedral, afterwards occupying the position of architect to the cathedral authorities. He was knighted in 1890, on the occasion of the public ceremony of opening the Science and Art Museum and National Library of Ireland, of which buildings he was the architect, in association with his son, Mr. Thomas Manly Deane. Sir Thomas Deane married, in 1851, Henrietta, daughter of Mr. J. Manly, of Ferney, Co. Cork.

Mr. Thomas James Flockton, senior partner in the well-known architectural firm of Messrs. Flockton, Gibbs and Flockton, of Sheffield, has died at the age of seventy-five. As a young man he came to London for a few years in the office of Sir Gilbert Scott, and being contemporary with the movement, took up with enthusiasm the Gothic revival. After being in business with his father, Mr. William Flockton, he started for himself and combined later with Mr. Gibbs, the firm receiving its present title three years ago when Mr. Charles B. Flockton was admitted. The deceased Mr. Flockton did a great deal of church and public work, was adviser to the Sheffield Corporation for the great street improvement scheme commenced about 1872, was the first president of the Sheffield Society of Architects and Surveyors, a F.R.I.B.A., and at one time had a seat on the council of the Institute.

Under Discussion.

CHELMSFORD A MILLION YEARS AGO.

It will surely be admitted that Mr. W. H. Shrubsole, F.G.S., F.R.M.S., by taking this one, chose a very startling title for his recent lecture at Chelmsford. The Mayor (Councillor Taylor), who presided, said he should be glad if Mr. Shrubsole could tell them where Chelmsfordians obtained water a million years ago, and whether it was possible to have water without paying rates. A view of the High Street at that time would also be interesting, so that they might find out whether there were obstructions then and how they were dealt with. Mr. Shrubsole showed upon the screen a section of the ground beneath Chelmsford, and stated that about 400ft. down they came upon chalk, and they might go hundreds of feet deep without getting to the end of this bed of chalk. This chalk, too, was spread over a large portion of England, and it had been proved that whenever chalk existed in an unmoved condition there, at some time or other, had been a broad ocean. Chelmsford had been at one time nothing but an indistinguishable spot in mid-ocean. Geological changes were still in progress, although the earth had lost the fire and ardour of its youth. Changes would probably go on for millions of years before the earth became unfit to sustain life. They might comfort themselves with the assurance that this good old earth would serve their purpose, and would last quite as long as they needed it as a place of habitation. The local water question seems to be the cause of much anxiety to the Mayor, for after thanking Mr. Shrubsole for his lecture he said he only hoped that when they touched the chalk at Chelmsford they would be happy in finding water.

AN INDIAN ON ART.

Mr. Sasi Kumar Hesh, an Indian artist, described his artistic experiences on the Continent and in this country in a paper which was recently read at the Imperial Institute under the auspices of the National Indian Association. By the aid of local patrons—principally that of Maharajah Mymensingh (how curious the name sounds in English ears)—he was enabled to pursue his artistic studies for three years in Rome, Paris, and London. He described the effect produced on his mind by examples of ancient art in the galleries at Rome, Florence, Paris, and elsewhere, and how his views widened and his experience deepened with the study of modern Italian, French, and German art. Coming last to the Royal Academy exhibition in London he confessed to considerable disappointment. Leaving aside Sargent, Herkomer, Orchardson, Collier, a few portraits by Shannon, and some landscapes, he found little in the exhibition worth notice. The work of John Sargent came up to his highest expectations, and that painter might fairly take his stand with such masters as Rembrandt and Velasquez. The chief characteristic of modern art was intense realism, and this was a source of danger the reality of which was evident in certain phases of French art. The danger lay in the lack of the ideal, without which the real became meaningless and inane. The ideal of the Greeks was physical perfection and beauty, and with Christian civilisation came another influence. But physical beauty was no longer conceded to be the highest ideal, and science had loosened the hold of the supernatural on the human mind. Modern art needed a new ideal, and where was it to be found?

ARCHITECTURAL PRACTICE 200 YEARS AGO.

At a recent meeting of the Architectural Association of Ireland Mr. T. E. Hudman delivered a lecture on "Architectural Practice 200 Years Ago." He mentioned that Vitruvius, who practised in Rome during the reigns of Augustus and Julius Cæsar, where there were seven hundred other architects in practice, was the greatest of architectural writers. The dull apathy towards all things artistic which followed the austerities of the Cromwellian period was followed by a re-awakening on classic lines, based on Vitruvius and Palladio. Up to the beginning of the eighteenth century architects were more like artists, and were frequently painters, sculptors, and silversmiths; they only supplied the sketches, and in large works superintended the making of a model to scale. The details were entrusted to a master builder, whose office was on the lines of the present day clerk of works, and it was owing to this that so many buildings showed such weakness in detail, though the general design showed evidence of skill and thought. Architects did sometimes superintend their buildings, but in those cases they were called surveyors, and generally held appointments as such to some public body. At the commencement of the eighteenth century architects and surveyors separated, and formed dual professions, and building work gradually worked its way into the system now in vogue. This was partly due to the enormous increase of building in London, consequent on the Great Fire of 1666, and also to the fact that in the time of Charles II. a series of legislative enactments came into force, which compelled buildings to be erected with some conformity to laws regulating stability and quality of materials, and called into being a staff of officials whose business it was to see their laws carried out. Those Acts had been repeatedly repealed and amended, but they remained for all that the by-laws regulating buildings now in force in the Kingdom.

IN SOME OLD GARDENS.

The members of the Birmingham and Midland Institute heard a very good lecture on "The History of Gardens" at their last meeting. Mr. Albert Forbes Sieveking gave the history very fully, beginning with the Garden of Eden and such ancient gardens as the hanging gardens of Babylon. Of the gardens of mediæval and modern Europe, however, he was able to give most circumstantial accounts from old writers, with sufficient lantern views from their books to furnish a lecture on the art of engraving. The masterpieces of the old French gardeners, the semi-oriental gardens of Moorish Spain—whose nearest kin are the gardens of Persia—and some lovely and famous old Italian gardens were beautifully illustrated. Speaking of Versailles, the most celebrated of French gardens, perhaps of all gardens, the lecturer mentioned that the fountains cost £200 an hour to work, while from first to last the gardens cost £8,000,000. The Tudor gardens of England, illustrated by woodcuts and by a small survival at Hampton Court, received due honour; and the Dutch garden, both at home and as naturalised in England after the arrival of William and Mary, was splendidly illustrated in the latter case by, among others, the Hampton Court gardens as they were in the days of Queen Anne, with their ingenious geometrical parterres and terraces, and long lines of clipped trees. So the lecturer proceeded, showing how Pope, by his writings and his garden at Twickenby, prepared the way for modern natural and landscape gardening, whose rise through the "sentimental" and "zigzag" styles was carefully and picturesquely traced. Some old Oxford and Cambridge College gardens, Vauxhall in its most famous days, Chatsworth, Esher, Melbourne, and other famous gardens associated with "the stately homes of England," Fred Walker's picture painted at Brockenhurst, known as "The Lady in the Garden," and several of Mr. Elgard's pictures of gardens at home and abroad were made use of as illustrations to the lecture. Kent's adherence to nature to the extent of planting dead trees was humorously referred to as a distinct case of "laying out." The lecturer concluded by pronouncing for a judicious eclecticism. The formal garden, whose designs were architectural in their origin, was best for use near the house; then the design should pass by a harmonious transition from complexity to simplicity, through the flower garden and the fruit garden to the orchard, to the park or landscape garden, and so on to the country and the natural scenery—an unbroken sequence from fine art to the wildest nature.

ELIZABETH'S LONDON.

Many curious statements were made last Wednesday by the Bishop of London at the meeting of the London Reform Union. He said he had known an old lady in North London who lived to be 105, and she could remember going in her youth to see the cows milked in what was now Finsbury Circus, and then walking across the fields to the village of Islington. St. Martin's-in-the-Fields told by its name its remoteness. Westminster was a village grouped round the royal palace there. On the other side of the river was the little ward of Southwark. There were fogs, but no smoke. The growth of London was just beginning, and continued, in spite of all attempts to check it. But the Londoners lived in London, and all villadom was unknown. The merchant lived at his place of business, and in the same street as the workmen or the lord. The streets were either torrents of dirt or paved with black mud; coaches were introduced in 1564. The Thames was the silent highway of London, and 2,000 wherries plied upon its waters. One bridge only spanned it, and that led into Southwark. At the time of Elizabeth the Lord Mayor's Show existed in much the same way as at the present day, save that the Lord Mayor went to Westminster in his barge. The water that Londoners drank in Elizabeth's day came from the Thames, and from conduits fed by streams from the northern hills. In the time of James I., the question became a difficult one, and it had remained a difficult one ever since. The houses were built of timber and of plaster. They were as a rule of two or three, and occasionally, as in Cheapside, of four storeys, and the upper storeys overhung the lower. In a street of some width the effect of such buildings was no doubt picturesque, but most of the streets were narrow lanes, and the projecting buildings almost met at the top, making the passage below gloomy and dark. The great glory of London was St. Paul's Cathedral, designed on a scale worthy of the dignity of the City, being 690ft. long by 130ft. broad. It was adorned with tombs and monuments which gave an epitome of civic life. These all disappeared in the Great Fire. The nave was a place of fashionable resort and was known as Paul's Walk, only the choir being used for Divine service. Outside the cathedral St. Paul's churchyard was mainly occupied by booksellers. The other great place of resort was the Royal Exchange, built by Sir Thomas Gresham and opened by Elizabeth, who gave it its name. The lecturer said he could not describe the lighting of the streets, because they were not lighted at all. It was a day of hard-headed and long-headed men, who were keen after business and after profits; indeed, he was not sure that as many "secret commissions" were not taken then as now.

THE PRE-RAPHAELITE MOVEMENT.

There was a large attendance at the New Gallery, Regent Street, W., last Friday evening to hear Mr. H. Wilson deliver his lecture (the second of the series instituted by the Arts and Crafts Exhibition Society) on "The Pre-Raphaelite School in relation to the Revival of Design and Handicraft." The old workers, he said, had their heart in their work, they had their own traditions, and strove to produce what was intelligible to the common people. Then, at the end of the fifteenth century, came the first influence of that passion for classical learning which afterwards changed Gothic England into Classic England, when the early beauties of the national work were veiled by a foreign tradition. The old spirit, however, showed clearly through the veil, but after two centuries had passed the workers had forgotten the ideals of their ancient predecessors, and their works were dull and foreign, and without creative merit. Yet even at the beginning of the present century there was some of the true spirit surviving, needing only a worshipper to revive it; such a man was William Blake (born in 1757), whose influence it was hardly possible to overestimate, a man possessing grand imagination and great creative powers. Though living in a time when the old training and tradition had disappeared, the very incompleteness of his works, due to a lack of education, has a charm which is not possessed by the productions of lesser men with greater skill. In thinking of Blake we should not forget his master, Basire, who had done so much to enlarge the spirit of his pupil's efforts. In all noble art it is the inner visage and spiritual body that signifies; it is not the adroit draughtsmanship or laboured technique, but the cry of spirit to spirit, mind stretching out toward mind, and Blake truly said of his contemporaries "They were blind and I have taught them to see." So important and far-reaching is his influence that an artist may now be known according to his attitude towards Blake. As Ruskin had pointed out, the name "Pre-Raphaelitism" is not only unnecessary but somewhat misleading, though having now become current Mr. Wilson was of opinion that it would have to continue. When Cornelius in 1844 was asked to undertake the decoration of the Houses of Parliament he recommended that the work should be given to William Dyce, and it was this work which had inspired young Madox Brown, who is so closely connected with the revival of the Arts and Crafts. Born in 1821, he had early showed remarkable powers, and a portrait of his father painted when young Brown was only fifteen years of age is perfectly astounding. After a training in Antwerp and Paris he became a perfect master of his craft, but though he had acquired great knowledge he had not found himself. Like Watts, he had the greatest contempt for handling and brush work, a fact which is chiefly exemplified in his cartoons. They are rubbed and scrubbed and it is not until you stand away from them that you see how the artist's self-denial has led you to the very heart of the subject. "Christ washing Peter's feet" (in the Tate Gallery), "Elijah and the Shunamite's son" (at South Kensington), "Ancilla Domini," "The Triumph of the Innocents," and "The Carpenter's Shop"—these, said Mr. Wilson, are the most perfectly impressive of the religious pictures of the present time. Perhaps the best work Madox Brown ever did are the frescoes in the town hall at Manchester. He was the precursor of the Brotherhood. The question now asked as to whose influence was the greatest on the movement—Holman Hunt's, Rossetti's, or Millais'—did not trouble these men, who worked with one heart, one spirit, and one mind, and if any could be said to hold the first place it would be Holman Hunt. The story of the lives of these men comes like an illuminated page in a dull book. Madox Brown was the Baptist of the movement and he prepared the way; Rossetti was the poet-painter gifted with great enthusiasm and passion and wonderful colour feeling; Hunt possessed the religious sense; Millais was the typical Englishman, but a perfect craftsman; and Burne-Jones was the dreamer whose dreams came true, and who had the great gifts of invention and of harmony combined with pertinacity; but all these men made one whole. After dealing with the modern critic, Mr. Wilson pointed out how Pre-Raphaelitism was the direct contrary of Impressionism. The aim of the Arts and Crafts Society was to produce first a school of artistic craftsmen, and second to imbue in the public an appreciation of the spirit of their works. It also desired to encourage the artist to be a craftsman, so that the resulting work might have the direct influence of the designer. According to Pre-Raphaelitism all beauty must be organic; beauty is the moment of transition; and the ideal, therefore, was the production of organic beauty. Pre-Raphaelitism had been much misunderstood, and we ought not to reproach it for not doing that which it had never intended to do; and it was out of this movement that the Arts and Crafts revival had sprung.

Bombay's First Block of Workmen's Dwellings is now being built.

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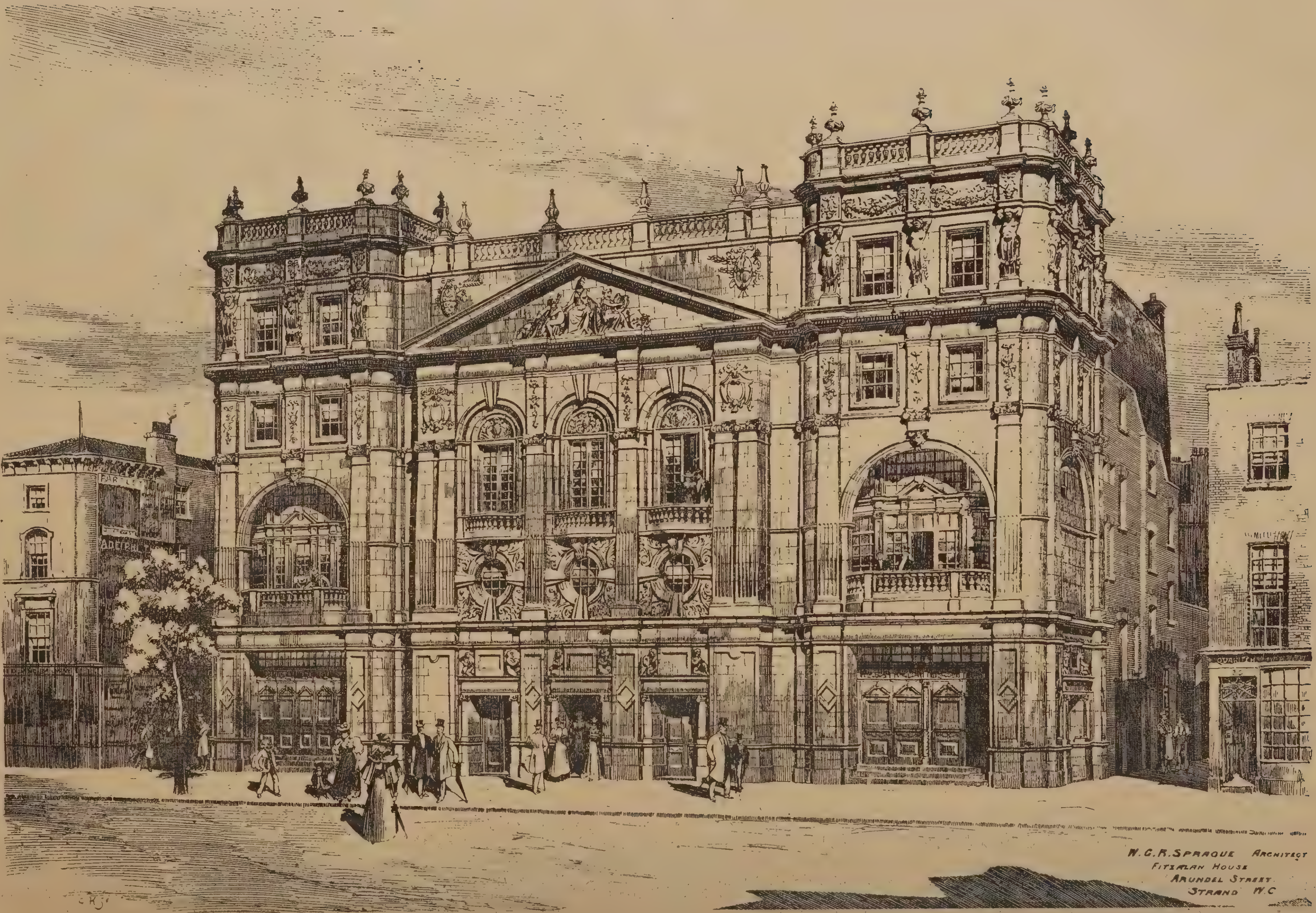

MR. CHARLES WYNDHAM'S THEATRE IN CHARING CROSS ROAD, LONDON, W.C. W. G. R. SPRAGUE, ARCHITECT.

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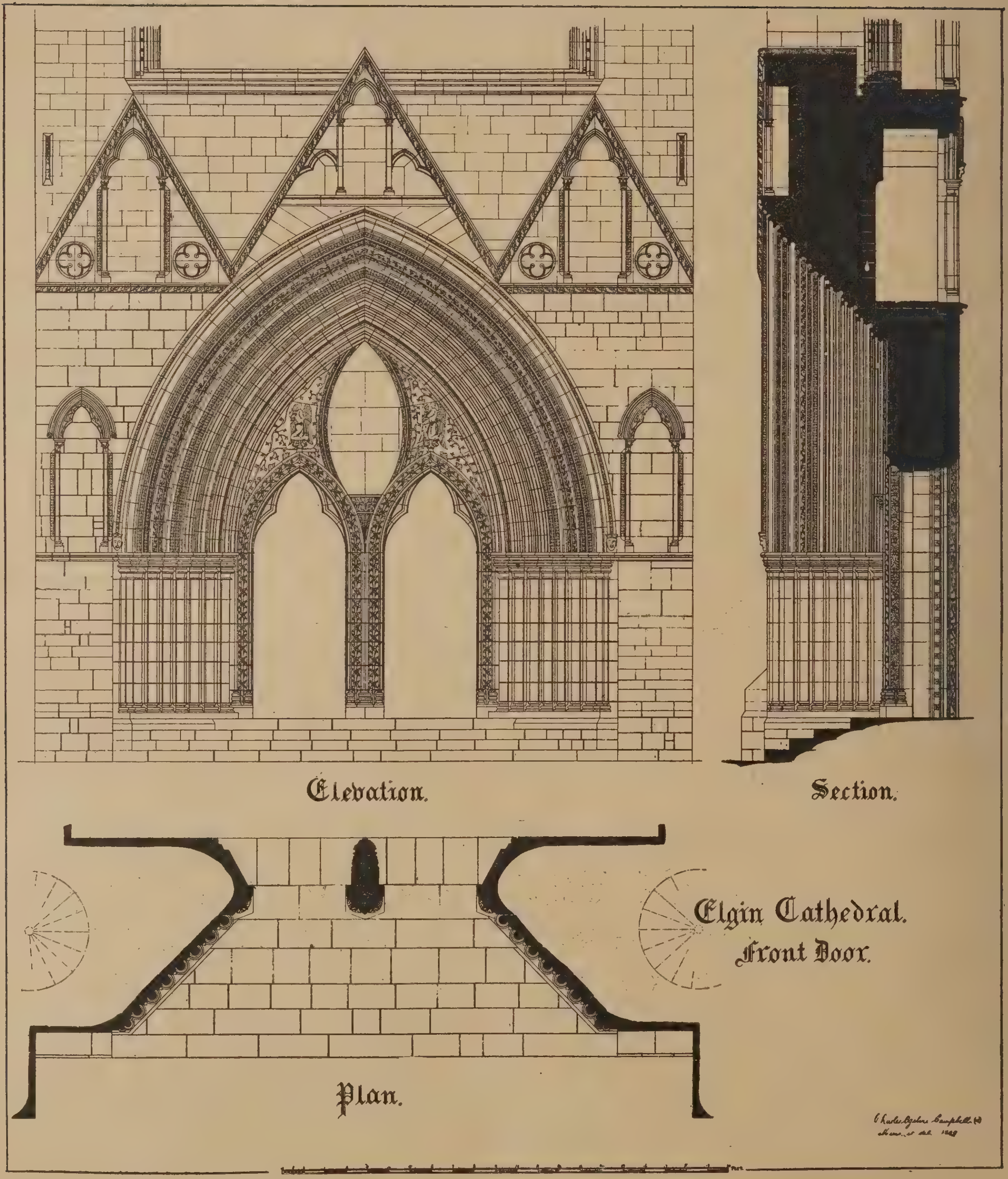
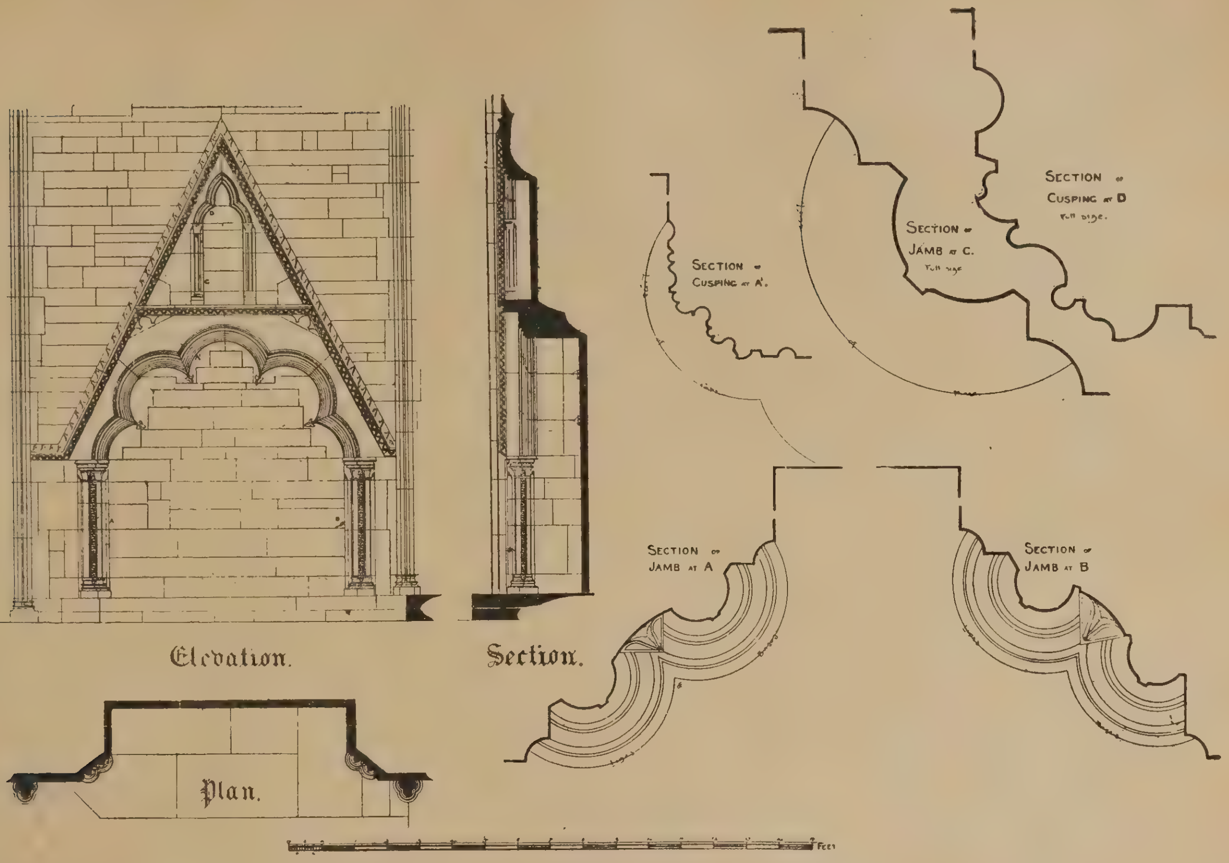
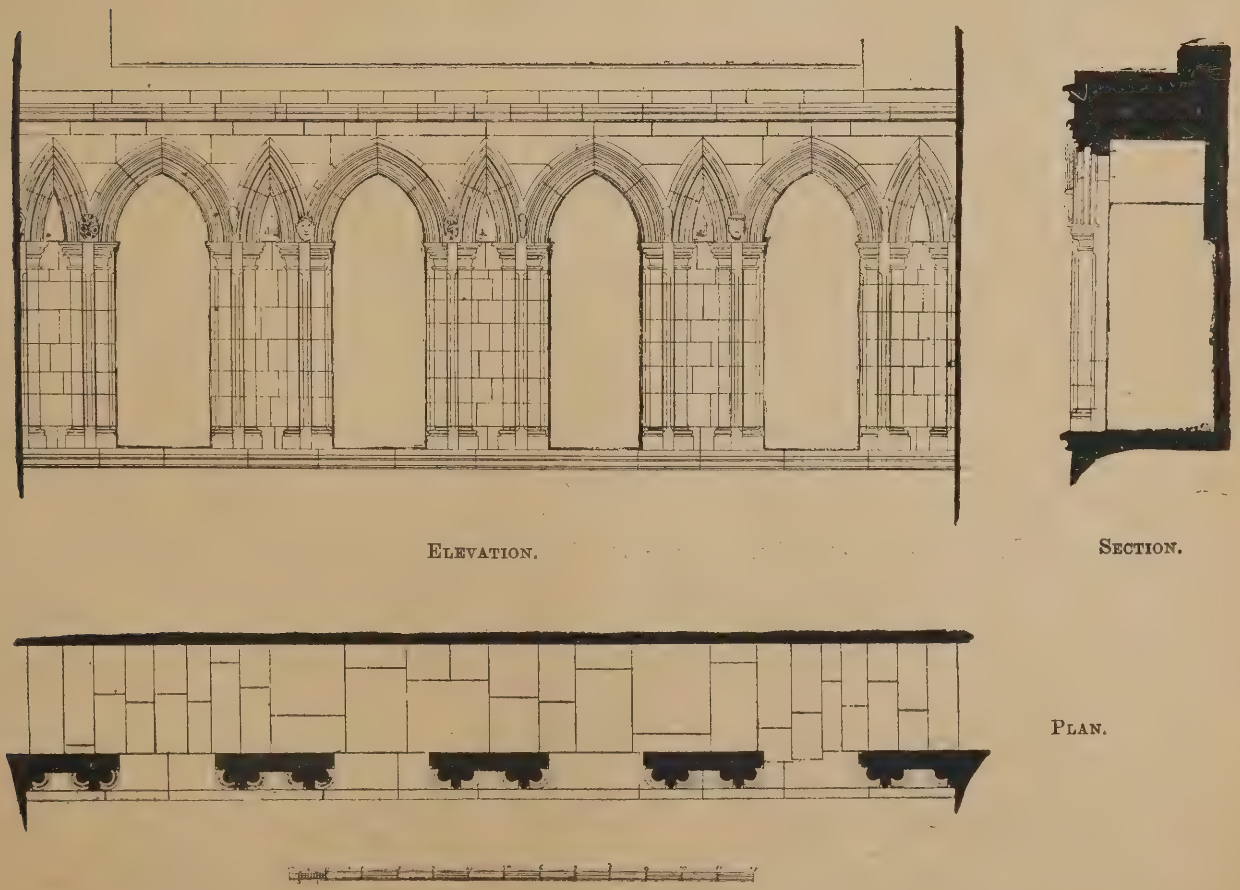


ELGIN CATHEDRAL. Measured


Elevation. Section. Plan.

Section of Cusping at A'.
Section of Jamb at C. Full size.
Section of Cusping at D Full size.
Section of Jamb at A
Section of Jamb at B
Feet

THE ALTAR TOMB.


Elevation. Section. Plan.

ARCADE OVER INSIDE OF WEST DOOR.

Drawn by Charles Ogilvie Campbell.

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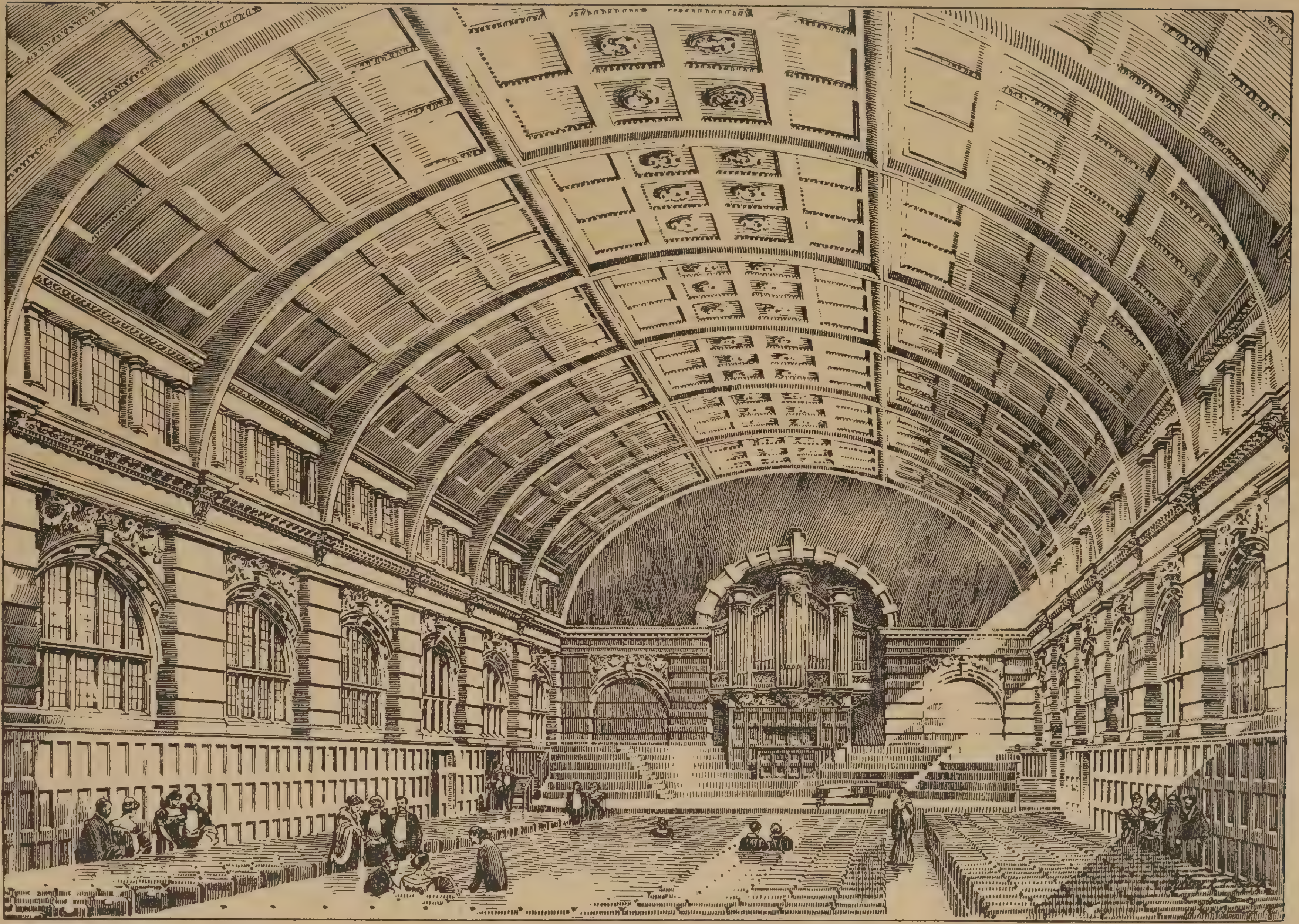

NEW CONCERT HALL, ROYAL COLLEGE OF MUSIC. Sidney R. J. Smith, Architect.

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R.I.B.A.

PRESIDENT'S ADDRESS.

(Concluded from page 213, No. CCXLVIII.)

IT took one hundred years of learning and study, initiated by the Humanists (who saw that, apart from the theological training of Mother Church, culture and scholarship are inseparable from true human greatness), to usher in the Italian Renaissance; and then a further century of study of Greek and Roman methods, and of experiment and invention elapsed during the Quattro Cento (of which the Hybrid Classic and Gothic of the Certosa at Pavia and the Cathedral at Como are exemplifications) between the rise of Brunelleschi, the erection of his Pitti Palace, and the dome of the Duomo of Florence, and the time of Bramante, Michael Angelo, Raphael, Giulio Romano, Peruzzi, Sansovino, Palladio, with the production of such works as the dome of St. Peter's, the Chapel of the Medici, the Villa Madama, the Library of St. Mark's, and other works of the best period of the Renaissance. Is there any reason for thinking that this history of an advance in, or a Renaissance of architectural art is in any way being repeated in our time, or that with the unexampled wealth and prosperity of this country during the last hundred years, there has been a stirring of the dead bones of Architecture, and that we may even now be travelling towards the goal of a development of a fresh expression of English thought, and an evolution of a new modern style that some day may be no disgrace to our Empire? Possibly this might be answered in the affirmative, but what the evolution of our present methods may become remains to be seen. At the end of last century the Renaissance of the Cinque Cento, which a century or more later found expression in this country through Inigo Jones and Wren, had for years been in its decadence, and was at a very low ebb in England. The ascendency of classicism in our public schools and universities, where Greek and Latin were taught to the exclusion of modern languages and science, naturally had its influence on architects as well as on the general public, and resulted in a revived interest in Greek art and the study of Grecian architecture. This was encouraged and assisted by the researches and publications of Dawkins and Wood, and Stuart and Adams. But though in the first quarter of this century

The Antique was the Fashion,

mere reproduction was sufficient for work which was inevitably devoid of life. Greek and Roman façades or porticoes were attached to modern structures, ancient designs were reproduced irrespective of their suitability to modern requirements—sometimes effectively, but always incongruously. The British Museum, St. Pancras Church, and many of the churches with Doric and other classic porticoes, and town halls of this period, illustrate this. After the first twenty years or so, a more intelligent use was made of classic forms and details. It was then sought to give some expression to the specific purpose of each building, and some of our architects, following the methods of the Renaissance, began to use the borrowed details of Greece and Rome as a means to an end, and strove to adapt them more intimately to modern wants. The best works of Barry, Wyatt, Cockerell, and some others, prove this. Also the printed works of Stuart and Revett, Cockerell and Penrose, showed the real meaning of classic architecture. It is sufficient for my purpose to name some of the most prominent of our classic architects and their works. Amongst them were Decimus Burton, Soane, Nash, Wilkins, Basevi, Smirke, Wyatt, Barry, Cockerell, Elmes, Pennethorne, Cuthbert-Broderick, Gibson, of many of whose buildings we are proud. As examples of some of these works may be named University College; the Fitzwilliam Museum, Cambridge; Bridgwater House; the Queen's Mews at Buckingham Palace; the Taylorian Institute at Oxford; the Travellers', Carlton, Reform, and Athenæum Clubs; the Royal Exchange; Regent Street Quadrant the Royal Institution and High Schools at Edinburgh; the St. George's Hall, Liverpool; the Leeds Town Hall; the London University; Burlington Gardens; our much-maligned National Gallery, which the late Lord Leighton said "had often been made the butt of curiously unmerited ridicule, though it is much easier to deride than better it;" and also the Union Bank, Bishopsgate. Such buildings as these show that a distinct revival of classic architecture arose in this country during the second quarter of the century and how great an influence classic education had upon men's minds, there being no recognised national style in which all were constrained by public sentiment to work. In fact classic architecture appeared to be well set in public estimation with considerable chance of becoming the national style. Still, however greatly we may admire these works, they are wanting in the real life and interest found in the best buildings of any style, whether Greek, Roman, Gothic or Renaissance. In many respects they were unsuited to modern conditions and environment, and they bear no hint in their sculptured adornment of our country's history or life, and are thus devoid of one of

The Most Vital and Essential Elements

of good architecture. It has been suggested that ornament is not Architecture, but a very subordinate and non-essential part of it. On the other hand Ruskin has said that structures without beautiful adornment are mere buildings and not Architecture. The truth may lie between the two, but it is certain that the best architecture has always been intimately allied with sculpture, which invariably lent it its most vivid and living interest. Apart from the more important buildings of this earlier half of the century, much cannot be said in favour of the domestic and more common buildings of these years. Stucco was predominant, it hid a multitude of sins, and, compared with the better built and simpler style of the domestic and cottage architecture of the last and earlier centuries, there was nothing to boast of. In ecclesiastical work the Gothic style was used concurrently with the classic for secular purposes, but mainly of a late or Perpendicular period, producing a cast-iron effect rather than exemplifying the spirit of good mediæval examples. Then came a different phase in the architectural thought of the century, which was almost the death blow to the classic revival. There were many elements at work, which produced the awakening of interest in mediæval art, and which caused classic to be almost superseded by Gothic architecture, at any rate for a time. The discovery of steam as a motive power, for one thing, had caused a great influx of wealth and ease of travelling, resulting in a wider knowledge of the architecture of other countries and of past styles. No modern movement has been more influenced by literature than

The Gothic Revival.

Horace Walpole may have been a fribble, but he had a firm though uninstructed faith in Gothic. Beckford, the author of "Vathek," spent much money on what he conceived to be mediæval art, while Sir Walter Scott both built and wrote Gothic as he knew it. Then about 1835, Pugin published his "Contrasts," a vivacious and most sarcastic criticism on Pagan methods of Architecture compared with mediæval or "Christian." In 1841 his apology for the revival of Christian architecture was published, and other works followed, full of ardent enthusiasm for the resuscitation of severe mediævalism, particularly in reference to ecclesiastical structures. Ruskin's writings also greatly influenced not only architects, but their religious tone appealed to the public. At first, though, they were too strong meat for babes, as was shown in much Gothic work done shortly after. For example, owing to some remarks of his on the value of the outlines of the openings of traceried windows being more important than the details of the moulded stonework, the very coarsest plate tracery was erected, I suppose in exemplification of this truth, and for the economy in labour in refined mouldings. He powerfully pointed out the beauties of Gothic work, and urged the necessity for the living interest of good and meaning sculpture in noble architecture. The publication of other works on mediæval art and architecture by Rickman, Pugin and Le Keux, Scott, Parker, the Ecclesiological Society, Nesfield, Street, Shaw, Butterfield, Burges, and others, also Viollet-le-Duc's "Dictionnaire Raisonné," with its magnificent analysis of the scientific construction of Gothic work, put this style in an altogether new and entertaining light before the student. It increased the attraction of thoughtful men to the beauty, science, and detail of the Gothic styles. I can well remember whilst a pupil with Burges the intense excitement caused by the arrival of each fresh part of this work. Added to this the Oxford Movement and the societies it gave rise to for the resuscitation of disused ecclesiastical forms and ritual caused the study of ancient Church architecture and arrangement to be taken up by the rising clergy and others at the universities, who henceforth were careful to go to the most capable architects of the Gothic School. This movement also provoked greater enthusiasm amongst the architects themselves. Then ensued

The Battle of the Styles.

The ardent enthusiasm of the Gothic men for a revival of mediæval art and architecture, which blinded them to the beauties of classic, and the persistent denunciation of the severe classicists who could see no merits in Gothic, gave good grounds for the vigorous diversion of opinion which raged during the middle years of this century. Gradually, however, the Gothic school seemed to gain an ascendency, which lasted until the seventies. There were, however, architects practising in both classic and Gothic, according to the tastes of their clients. Wilkins practised in both styles and the best work the Italian Barry produced was perhaps our Gothic Houses of Parliament. At first the early thirteenth and fourteenth century English work was the admiration of these Gothic partisans; then Viollet-le-Duc's works brought early French into fashion, as being larger and grander in effect. Later on, entire satisfaction not being derived from these (they were, I suppose, too simple and pure for the complicated environment of our many-sided lives), Decorated and Jacobean each had their turn. Amongst the works of this Gothic awakening, those of Pugin, Scott and Moffatt, Pritchard, Paley, Butterfield, Street, Burges, Godwin, Pearson, and I may now add the name of Sir A. Blomfield, and some others still alive, are the most prominent, noted mainly in ecclesiastical buildings. I cannot here name examples of the works of all these men, and the best of them are known, I suppose, to most of us. It was in the forties that Pugin built his own house and church at Ramsgate, the only work, I believe, he said he ever really enjoyed doing, and this because he was unhampered by a client. A little later he rebuilt Alton Towers for the Earl of Shrewsbury, and St. John's Hospital, Alton. He also erected or restored some forty or more churches and cathedrals, and some twenty conventual and a number of domestic buildings. But the work which perhaps added most to his fame was the assistance he rendered in the working out of the intricate and refined details of Sir Charles Barry's sumptuous design for

The Houses of Parliament.

To my mind it is a fine combination, classical in its symmetry and horizontality, and Gothic in its picturesque outline and detail. In many respects it is the most notable building erected in England during this century, and to many it must be a matter of congratulation that our great Houses of Parliament should have been designed in a national English style of architecture, rather than in the more monumental classic. At any rate, whatever our views as to style may be, it stands as one of the most complete and best buildings of modern Europe. Of the men of this period, Sir Gilbert Scott stands out pre-eminent, not so much, perhaps, on account of any very particular individuality or extraordinary excellence in his works—though at the time they were extraordinary—as or the great part he played in the revival of this period, his enthusiastic zeal, and the establishment of what one might almost call a school of Gothic architecture, caused by the enormous number of works carried out by him in the erection and restoration of churches and cathedrals, and the training of a staff or school of young men sufficient for the purposes of his enormous practice. But for the overbearing attitude of Lord Palmerston we might have had from Sir Gilbert Scott in the Foreign and Colonial Offices a building which would have been as grand a success as the Houses of Parliament. However critically we may examine, at the present day, the works of these great men, we must always remember that the advantages of our time in easy travel, access to architectural libraries, and the multiplicity of illustrated works on all branches of Architecture now open to us, and the enormous increase during the last fifty years of archæological works, were not experienced by them. They were not smothered by learning as we are; they had to find out for themselves that which we can learn easily from others, and with more limited knowledge than the student of these days *ought* to possess, they worked energetically and earnestly for the resuscitation of our indigenous style of architecture. Further, however much the methods adopted for the

Preservation of Our National Monuments

may be cavilled at, and criticism is often captious, had it not been for the men of this period many of these buildings would have been, by this time, well on the road to irretrievable ruin. To them, therefore, members of this Institute, and men who gave much time and thought to its working, not only our gratitude, but that of the nation, is due. In some respects, perhaps, William Burges was the most original of the purist school of Gothic architects of this revival period, and the most deeply imbued with the mediæval spirit and the most familiar with its art and craftsmanship. He insisted that Architecture was not worthy of the name if it did not tell some tale, historic, poetic, or otherwise. He also urged a point which seems to have been lost sight of in these later years—namely, that all architects should learn to draw the human figure, and design their own sculpture—at least as to grouping and arrangement. His competitive design for the Law Courts, if not the best, was certainly the most monumental and notable of the Gothic ones submitted. His work at Cardiff for the Marquis of Bute, and in his own house in Kensington, in Cork Cathedral and Studley Royal and Ripon Churches, shows a genius for the invention of interesting and beautiful detail in the true mediæval spirit that no other architect of this age has approached.

Street's Works

are also so well known to you all that to mention more than one or two would be waste of time. He was one of those who saw that ecclesiastical architecture should meet the requirements of modern times—that large churches should be adapted for congregational purposes—and it is instructive to note his endeavours to connect a wide nave with a narrow choir—not always successfully, as at Bournemouth, where he canted the easternmost bays of the nave inwards, causing a pinched effect just where an open and spacious area seems to be demanded. His works, whether ecclesiastical, public, or private, were always interesting from the vigorous personality impressed upon them, and this was always apparent in his early works, as in the church at Garden Street, Westminster, in the later and much more refined one at Vassal Road, Kennington, in the house he erected for himself at Holmbury St. Mary, the mansion in Cadogan Square, and in the Law Courts, which was the last great effort of his life. These Law Courts unfortunately seem to have given the death blow to Gothic. It was not the fault of the architect so much as that of the building committee, which seems to have been determined to have a large central hall. Accordingly designs without this feature were discarded, notwithstanding that this waste of space, useless also as a foyer to the courts, deprived the building—to which an insufficient site had been appropriated—of the last chance of obtaining light and air to the corridors. The plan of this building may not be all that could be desired, but that is hardly the fault of the style of Architecture, though from this fact it has been argued that Gothic is unsuited to modern requirements.

Of the other notable figures in this revival of mediæval architecture I will only mention one. All were working for the same end, though often on slightly different lines and with varied success as to the quality of their work. In referring to the late Mr. Pearson I will only mention his last and, I suppose, his best and most beautiful work—Truro Cathedral—and that simply to point out what was certainly one of the failings in the methods of the Gothic revival. Truro is a modern cathedral intended to serve modern needs, but it appears to have been designed with a view to reproducing a mediæval church, whose plan was originated to meet requirements of other ages entirely different from those of to-day. There can be no doubt that for congregational purposes in these days, and for worship in which all can join, a central tower on piers blocking up the best part of the internal area is a sad mistake, and inexcusable unless a particular object of our church building is to erect in plan and detail mediæval structures that in future ages may deceive the enquiring archæologist. This was not the spirit of the men of the Italian Renaissance. But it is useless to attempt to specify the characteristics or buildings of each of the notable men of this Gothic revival period; their best works are known to us all. However adversely faddism or conceit may criticise many of them, it cannot but be felt that they greatly redound to the credit of the architects of this period, and also add the greatest interest to the history of the Architecture of the century.

Since the seventies, hot enthusiasm for a resuscitation of any definite style of Gothic seems to have smouldered and died, and to have been succeeded by

A Period of Flirtation

with pretty well all styles of Architecture. Byzantine, Moorish, Romanesque, Queen Anne, Dutch, French Renaissance, and even Egyptian have each had their admirers. The plain and severe, the rococo and ugly, the picturesque and grotesque have all been tried—all being the result of the study or copyism of debased deductions from those original styles which inspired the greater classic and Gothic architects of the second and third quarters of this century. The study of the purest examples of Art or Architecture must be the best tuition; if we endeavour to emulate the debased, our work will be on a still lower grade:

> "Noble souls
> Still find the base is hurtful, and the good
> Is full of glory."

I have heard of an architect saying he adored drawing a piece of impure detail, and another that he delighted in designing something that would give a shock, and I think their works prove the truth of their remarks. Such sentiments, however, can arise only from an ill-regulated fancy, or from a vulgar desire to attract attention, and cannot lead to great results. The overloading of detail and ornamentation is again another phase of a similar feeling. Many of the so-called adornments of modern buildings are not only not indispensable, but positively detrimental to the dignity of Architecture. Nevertheless, these latter years have been marked by a keen study and most enthusiastic interest in, and desire for, the good and beautiful in Architecture, with an earnest attention and effort to discover the right adaptation of known (and shall I add sometimes unknown) architectural forms to the manifold and complicated requirements of the time.

In looking back, then, generally at the architectural work of the century, what evidence is there of there having been, or being, any revival of Architecture in any way similar to those of past periods? Sir Gilbert Scott once said in these rooms, in reference to the earnest enthusiasm of the middle of the century for a resuscitation of our English Gothic architecture, that no parallel to it had occurred since the Italian Renaissance, and I believe he was right; and, further, I believe that we are at the present moment in course of an evolution in Art that may in time result in an uniform national style, and for the following reasons:—During this century there seem to have been three fairly distinctive periods; in the first the classic style was zealously cultivated; in the second the resuscitation of Gothic was passionately preached; in the third no one style has predominated, but there has been a restless searching and craving for something that shall satisfy the conditions and requirements of modern life. In the first period, though classic teaching led to the study of, and desire for, a revival of the antique, it was differentiated from the movement in Italy of the fifteenth century by so many of our architects

Subordinating Modern Requirements

to a clothing of ancient examples reproduced for the purpose, rather than designing in ancient methods with an individualistic treatment suitable to the occasion. This arrested true progress. It therefore failed in altogether impressing the nation with its suitability for English nineteenth - century architecture. Nevertheless, there was in the movement a zeal for stately and noble work, and it was this desire which caused the founding of the Royal Institute of British Architects as one means for the attainment of the end. The second period, with its thirst for knowledge and culture and facilities for education, certainly evinced a similar feeling to that which found expression in the Humanists of the fourteenth century in their insistence on scholarship and culture being necessary for the elevation of mankind. In their case it was apart from, rather than in conjunction with, theological teaching, while in this century, notwithstanding the broad views and freethinking tendencies of the age, it has been side by side with a distinctive religious awakening, which started and then kept alive the interest and desire for a revival of mediæval art, under the plea that it alone was Christian. This mid-century Gothic movement began with ecclesiastical architecture, and extended itself to civil work also. But it failed, as did the classic movement, in establishing itself as a recognised national method or style, and also for somewhat similar reasons

A Slavish Copyism

was engendered by reason of the scorn cast by the purists on detail inexact in its reproduction. To this school it seemed of more importance that every portion and detail of a modern Gothic building should have its precedent in the Middle Ages than that, as a building, it should exactly meet modern needs. This arrested individualism and thoughtful adaptation of the mediæval methods to our complicated modern wants. It was exactly (with some exceptions) the reverse of the principle which actuated the sculptor-architects of the Italian Renaissance. They adopted antique methods and details, and with original ingenuity pressed them into subserving their plans, not permitting them to dominate the requirements of the time. Nevertheless there was in this Gothic movement the evidence of life and a distinctive and ardent striving after architectural light, and a national general style; and this feeling was fostered and kept alive by men who were members of this Institute. England owes much to the men who led our classic and Gothic schools, and one cannot but feel that Fergusson's severe criticisms on their works are harsh and unjust. From his remarks it might be supposed that they used no brain power whatever, but simply copied, nor cared to do more than copy. He argues as if it were to be expected that a perfect style suitable to all our complex modern life could have been attained at one jump. We know that long periods, centuries even, are required for such an evolution. He seems to have thought that their first efforts should have reached the highest levels. A more reasonable view is that the copyism he denounces was but the first step in a legitimate process of development. Both by the classic and Gothic purists of this country that step was honestly taken. In this the third distinctive period of the century we see architects abandoning purism, and betaking themselves to an eclectic treatment of the two great branches of style. May we not hope that along this line a national architecture may eventually be reached, at once good in an artistic sense, and flexible and useful from a practical point of view? An analogous phase was gone through in the early Renaissance. Should this happen, I venture to think it will be found that the R.I.B.A. has contributed to it in no small degree. For the leaders of the movements I have indicated were members of our body, and we may justly congratulate ourselves on the steps we are taking to foster emulation of such excellent examples, for the careful and wide study of the rising generation of architects is fostered by it, and their keen interest is proved by the splendid results shown in the work produced under the incentives offered by this Institute in the presentation of medals, prizes, and travelling studentships for design, draughtsmanship, and for architectural research. Personally, I have a strong conviction that the evolution of a sound architectural style must be accompanied by a development of the neglected art of

Architectural Sculpture.

At all the best periods of architectural development, the sculptured adornments of the buildings (except where religion forbade, as amongst the Mahomedans) told their history. Have we, with our enormous Empire, nothing to record? Or is it owing to inability, indifference, or parsimony, that our life and history find no place in our architecture? Or does the crushing weight of the utilitarian element overwhelm artistic effort? Our Houses of Parliament have some forty or fifty statues of kings, &c.; the sculptured subjects suggested in Scott's Foreign Office design and Street's Law Courts were pruned away by the Government. Our huge railway stations and commercial and domestic buildings show nothing but meaningless ornament. Will our new public offices illustrate in any way the growth of Her Imperial Majesty's dominions? Or is the country too poor or indifferent to give our sculptors such a chance? Is it not impolitic of a Government in these discontented days to discourage the development of a craft the highest in Art, which elevates public spirit, gives employment to a large class of the most intelligent workers, and at the same time

Raises the Standard of Architecture,

and enhances the glory of a country. I learn that Frankfort has lately started a fund the income from which is to be spent in the adornment of the town with sculpture. This shows the increasing feeling there is in the cultivated world for such a step. Why cannot we do likewise? However, sculpture is a detail of refinement and adornment, and, if architects would suggest it properly and wisely, might possibly more often find place in our buildings. But aid, from sources external, to architects is needed in other ways if a national architecture is ever to be arrived at. London seems practically in process of rebuilding in its main centres, and constant enlargement is taking place in the suburbs. Surely steps should be taken to prevent our new streets being eyesores instead of improvements, and to avoid the repetition of such a medley of incongruities and commonplaces as may be found in Shaftesbury Avenue and Charing Cross Road. Architectural opportunities in these streets were afforded, which, under proper control, might have had a magnificent result. Surely there should be some controlling power to settle the general lines, heights, and materials of buildings and style of design. That the London County Council has something to say as to construction and heights is true, but their purely practical conditions being complied with, anyone can build according as his own sweet will, taste, or ignorance may prompt. This cannot be the right method in a great empire for the fostering of a national art like architecture. Every man who builds in a public street has a duty to the public to perform. His building should not endanger the safety of the public, but neither should it be a shock to their sensibilities. Proper control should render it impossible for us to see such a thing as I noticed the other day—a dull red brick Renaissance house on one side of a bright, glazed, teapot ware, pseudo-Gothic building, and a stone nondescript erection on the other, all of different heights, horizontality, and materials; while close by was another huge stone façade with heavy projecting columns and pediments, constructed surface ornament, standing apparently on nothing but sheets of plate-glass. Can anything be worse? Notwithstanding the modern shopman's requirements, architects should resolutely set their faces against such hideous uglinesses. In indifferent matters each man should have liberty of taste, if the indulgence thereof injures neither himself nor others. Individualism is needed in Art, but if the imagination or individuality be only a mark of undisciplined self and an offence to Art, it is positively injurious in its demoralisation of public taste, and should be restrained. Were there

A Ministry of Fine Arts,

with a committee of control under a chief whose qualifications were not *only* political, surely something might be done. The committee who were responsible for the Chicago Exhibition—a work which was magnificent in its effect, as all who saw it were agreed—was composed of architects and sculptors, who were charged with the erection and adornment of the numerous palaces. This committee settled the general style of buildings to be erected, the heights of cornices, floors, &c.; and each design was submitted to the criticism of the whole committee, who passed it, or suggested improvements, which the architect was forced to consider. The result was grand and stately, such as those who did not see it can hardly realise. I only mention this to show what can be done by intelligent control, and I do not think we are behind our American cousins in either intelligence or capacity for design. The Ministry of Fine Arts in Paris has such a controlling voice in all matters of public works, in laying out of the streets or boulevards, in the erection of public monuments, and even in their bridges, that in France it is entirely out of the power of anyone to erect unsightly edifices in prominent positions to the annoyance of the artistic sense of the nation. There is another thing that also affects our architectural design. We are always, in these days of greedy competition, in

Too Great a Hurry and Rush.

Art is long, and sufficient time for thought and quiet for solitary reflection is not afforded the busy architects of the day to properly solve the problems set before them. Designs for half a million's worth of building have to be prepared, submitted, and passed probably in, say, three months, and then the unfortunate architect is told that his designs are not equal to those of past ages. Ralph Waldo Emerson says: "We do not get enough of solitude, with the result that our minds are in danger of being vulgarised and of being unable to see things in their proper proportion." This is exactly what frequently happens to the architect of to-day; he does not get enough quiet for meditation. Let us hope that next century our architects, with their increasing wisdom which will enforce periods of rest for reflection and mental recuperation, and with higher cultivation which will improve taste, and under wiser auspices which, with an imperial spirit, will exercise an enlightened control, may develop a true style, sufficient for modern requirements and satisfying to æstheticism. As this goal cannot be reached by architects working on different methods and lines, and competing to outdo each other by differences or eccentricities of style, let us hope that we may, in a glorious enthusiasm for our art, be led to sink personal predilections in a combined effort to elucidate some style suited to the twentieth century, which, while allowing of individualism in the treatment of details, may have a general harmony and at last eventuate in a distinctive national architecture, stately dignified and picturesque; that may enhance the glory of this great empire, and be a proof that the British nation is neither sordid nor penurious, but that in its highest state of civilisation it may prove itself capable of emulating the best art history of past ages.

Mr. J. Macvicar Anderson said he had great pleasure in proposing a vote of thanks to the President for his address. He congratulated him on occupying the presidential chair. Knowing the duties and responsibilities of and also the pleasure of occupying that position, he was fully persuaded that he would discharge those duties in a manner not only creditable to the Institute, but to the profession of Architecture. He looked upon the address as a masterly review of the Architecture of the present century, full of research and breadth of thought and entirely free from any illiberality or sceptical opinion. The financial position of the Institute was a much more satisfactory one now than when he (Mr. Anderson) was in office. In 1896 there was a surplus of £591; in 1897, £1,116; and in 1898, £1,241. He hoped the Council would realise that because they had a surplus they need not spend it. He had always maintained that the Institute ought to have a more worthy home than they had. He urged them not to be in too great a hurry, but wait until they had, say, a surplus of £30,000. London was making enormous advances; the suburbs were being extended with amazing rapidity, but central London was becoming more and more congested. In the coming century the principal thoroughfares of central London must be widened and enlarged, and he asked would these opportunities be properly and worthily taken advantage of? He turned to the President's address for an answer, where it was stated that the study of the purest examples of Art or Architecture must be the best tuition. In this he heartily agreed, but later on the President said, in reference to this period: "We see architects abandoning purism and betaking themselves to an eclectic treatment of the two branches of style." In his humble opinion this was not so encouraging. Mr. Emerson had taken an optimistic view of the situation; he could only hope that results would justify that opinion. In reference to the President's remarks about some controlling power over London architecture, if this consisted in the appointment of a Cabinet Minister for political reasons it would not lead to any good whatever; if, on the other hand, a permanent Minister of Fine Arts were appointed solely because of his ability and knowledge of the arts, then good might result.

Mr. Joseph Smith, president of the Sheffield Society of Architects, in seconding the vote of thanks, said the Institute would do well to remember that 48 per cent. of its members were in the provinces. And they had only just tapped this source of membership, and he was sure that if the Institute would try to become of practical value to provincial architects, as it had become to metropolitan architects, it would acquire a much larger accession in membership. He did not agree with the President in his remarks as to definite and conscious efforts to realise a national style of architecture, but rather thought the contrary; they would best evolve a national style by honestly and seriously working out the problems which came to them day by day, meeting the requirements of those for whom they built, and clothing their efforts in the most artistic and pleasing forms.

Mr. F. C. Penrose wished to say, with regard to the new century, there was still one year to wait before the end of this present one.

The vote was then put to the meeting by Mr. Anderson and carried unanimously.

Mr. Emerson, in reply, said he had not worded the last sentences of his address so carefully as he would wish; he fully agreed with Mr. Smith that we ought not to strive to evolve a style; it must of course be a mere question of evolution and must come out of designing to meet the requirements of the age.

ARCHITECTURAL ASSOCIATION.

MARBLE.

A MEETING of this Association was held last Friday night, at No. 9, Conduit Street, Regent Street, W., Mr. G. H. Fellowes Prynne, the president, in the chair. The minutes having been read and confirmed, the following gentlemen were then elected members :—C. Thunder, H. B. Squire, W. A. Scott, W. H. E. Roberts, E. D. Dixon, T. J. Münka, J. A. Hossack, E. Gunn, M. J. Dawson, H. H. Dawson, H. P. Carter, C. T. E. C. Brooks, E. E. Bowden, and E. G. Allen. Messrs. A. H. Hart and H. A. Satchell were then re-elected members of the committee, having resigned in accordance with the rules of the Association as to officials. On the motion of Mr. Fellowes Prynne, votes of condolence were passed to the families of the late Sir Arthur W. Blomfield, and Sir T. N. Deane, of Ireland. The hon. secretary announced that as Mr. Gerald Moira would not be able to read his paper on December 15th, Mr. Andrew Oliver had kindly consented to read in its place a paper on "Old London," illustrated by lantern views. Mr. W. Brindley then read his paper on "Marble" as follows:—

In Architecture, the word marble conveys the idea of a stone of more importance than an ordinary building material. It is a stone, always possessed of some special beauty, either in texture, colour, or both, and of sufficient hardness to take a polish. The varieties are almost infinite, and, as numerous as they are, it is rare that any two quarries are precisely the same; there is

Always an Individuality

of some sort or other. We have marbles of one uniform colour, as white, black, grey, red, yellow, green, and so on; but in all cases, even in whites and blacks, there are differences. The whites of Carrara, Italy, vary with those of Greece, Spain, and America. The blacks of Belgium are not the same as those of England and Ireland. The serpentines of the Lizard, Cornwall, vary with those of Banff, in Scotland, and Anglesea, and further vary with those of the Continent and America. These variations are not to be wondered at, when for a moment we study their origin, and the different changes they have gone through as part of the earth's crust. Their ages are equally wide, some being, comparatively speaking, recent, while others are old, and some very old. The white crystalline marbles are now conclusively proved to be nothing more than ordinary sedimentary limestone rocks, like our chalk cliffs, or carboniferous rocks, which have gone through a process of cooking or baking under great pressure, while being hermetically sealed by overlaying rocks, which have kept in the gases, causing the limestone rock to crystallise and alter its nature to such an extent that rarely any of the fossils are now discernible; in short, a new rock is produced. There are other whites that have been produced by hot springs carrying, in solution, a large quantity of lime and silica, which deposits directly the carbonic acid gas is liberated in the atmosphere, often producing a rock of the purest whiteness, or coloured by any metal that the hot water may pass through.

Black Marble

is a sedimentary limestone coloured by carbon, which colour is immediately destroyed by heat, producing the whitest of lime oxide. We get black marbles with white veins; these white veins are usually younger than the rock itself, being infillings of the cracks produced by different causes in the history of the rock. These remarks about black rocks apply equally to red and yellow ones. Another class of marble, the Breccias, have gone through all sorts of nature's changes and disturbances; they are rocks that have been broken into irregular fragments, and been cemented together again by nature, and after that in some cases have gone through a baking process and the like. Nearly all our green marbles are earlier rocks that have been altered, and in some instances been broken up and re-cemented, like Verde Antico. The greens are nearly all magnesia while the whites in the same mass are lime; occasionally we get both white and green magnesia in the same mass. This slight geological introduction will prove to you that, as marbles are produced under such varying conditions, the quality must be equally various, both in hardness and durability. Again, some marbles, like the Purbeck, are not much more than very greatly compressed mud and fossils, whereas others are only baked compressed clays. When used in damp situations, these often go back to their original elements, and it further happens that a marble that behaves fairly well in Italy frequently will not stand at all with us. And there are marbles that, like building stones, have to be placed on their natural bed. Most marbles will stand in isolated shafts, or engaged pilasters, but experience shows us that only a very limited number used as

Slabs for Wall Linings

can resist the moisture of a newly built wall. The destructive power of this moisture, be it hydraulic or chemical, is such that it very shortly destroys the face of many marbles; all those of a slatey or sedimentary nature, face-bedded, go directly—for instance, the Swiss Cipollino—but if cut across the bed stands fairly well. Then again, certain marbles, like Purbeck, Emperor's Red, and Verona, which consist chiefly of flatish fossil shells, when face-bedded on damp walls become pitted with small holes, while across the bed they stand all right; nearly all this class of fossil marble is only obtainable in thin beds, so a large slab has to be face-bedded. These same remarks apply to certain red marbles found near Carrara, which are red clays compressed and baked by the same heat that has produced the crystalline whites. When the Greeks used marble in Architecture it was always treated as an ordinary building stone; no attempt was made to save material, everything being massive, and the blocks were ground or rubbed together until the whole structure was next to homogenous, without the aid of mortar or cement. Their columns, as you are aware, were built with thick drums; these blocks were worked roughly in the quarries, with projecting bosses on the sides, to which, most probably, were attached some wooden arms to enable the blocks to be revolved forwards and backwards on the wooden centres until the two faces came together with an almost invisible joint. When built the whole column mass was skilfully masoned into a pillar with all the Greek subtlety of diminishing entasis, and delicate flutings. The durability of this work, had it not have been for earthquakes, and the ravages of man, would have been perfect now. Those who have not seen

The Acropolis of Athens

can scarcely realise the beauty of this immense marble pile, whose sublimity of colour is in harmony with the subtlety of form. It is not the cold blue-white marble of Italy, so common with us, but a translucent warm ivory tint, becoming often ochre yellow; this deep colour which is only surface, is usually attributed to great age, but this is not correct, as is proved by the colouring of recent fractures on the Parthenon, and by modern buildings in Athens, a good example of which is a high slab plinth round the Royal Palace. This marble is already nearly as yellow as the Parthenon. The marble contains minute crystals of iron pyrites, the decomposition of which yellow ochre colours the marble. In the Greek temples of Delphi, Sicily, and Pompeii, the common worked stone was plastered over with a marble-like stucco, which is thought to be marble dust with lime and albumen. I think now from what I saw recently in Greece, that it may be white crystalline marble not quite burnt through into lime; this I saw being finely crushed with rollers by horse power for plaster work.

Early Quarrying.

There is no doubt the Greek methods of quarrying became the Roman, but it is impossible to imagine that the Greek could have quarried better than what we now find remaining of Roman work, and this not only in the white quarries of Pentelicus, but in the various coloured quarries found in many of the Greek islands. These old Roman workings you can always tell at a glance by the carefully tooled upright face of the rock. I saw lately in an old quarry on the island of Scyros an axed face some 60ft. high. Although the Romans took over all the Greek white quarries, they were not content with this, but opened quarries of choice colour wherever they could be found, and these they worked for monoliths to embellish their buildings in Rome and colonial cities. The Roman method of quarrying monoliths for shafts and architraves was by working them *in situ* engaged to the parent rock, either horizontal or vertical, according to the bedding and the solidity of the rock. In the Verde Antico quarries the upright large semicircular hollows remain showing where the great Justinian columns for St. Sophia, Constantinople, were got. Sarcophagi were quarried by being worked all round engaged to the rock at the bottom, being afterwards wedged off. In the old Carystian quarries of Cipollino, there are many examples of both finished and unfinished bed work *in situ*. In one quarry, some two thousand feet up the very steep mountain side of "Ocha," on a shelving mass of rock overhanging an awful precipice, are eight columns, 39ft. long, beautifully wrought, with entasis and top and bottom members quite finished and ready to be fixed, probably in the portico of the temple like that of Antonius and Faustine in the Forum of Rome; one of them is only a few feet off the sloping edge of the precipice. How they contemplated getting them away is and must, I fear, ever remain a mystery. In addition to these finished columns, there are several of similar size, partially wrought, engaged to the horizontal face of the rock; other immense masses were stept and partially worked for various purposes.

White Marble.

Roughly speaking, perhaps, three-fourths of the white marble used in the world at the present day comes from the Carrara district of Italy. The marble mountains extend some twelve miles; they consist of mountain peaks going up to an altitude of 6,000ft. The sides of these mountains are scored with valleys and ravines which have only three outlets—Carrara, Massa and Seravezza. On the sides of these valleys are the different quarries, of which there are some 600, "producing annually about 200,000 tons." The water coming from these ravines turns innumerable sawing mills, which slab annually some 60,000 tons of marble. The towns are full of workshops and studios. The marble businesses support in the district some 10,000 people. Any young student who likes mountain scenery, with picturesque sketching and architecture, cannot find a hunting-ground anywhere to surpass this. He will find beautiful Byzantine, Mediæval and Renaissance work in marble that cannot be surpassed, or rarely equalled in Italy. It was the land of the Medici, the playground of Michelangelo and Donatello. I believe a young man could spend a month, pay his fare from London and back, hotel accommodation, including food and Chiante wine *ad libitum*, for less than it would cost at an English seaside town. He would also pick up a little Italian. Nearly all the best statuary of the world is quarried at Mont Altissimo, Seravezza, near Carrara, this is the famous H-marked statuary of commerce, H being for Henraux, the proprietor. In Italy there are also old white quarries near the coast not far from Grosetta, between Pisa and Rome. The Cathedral of Milan was built from quarries above Baveno. Spain has several extensive deposits of white marble. The best is the one the Moors used at the Alhambra, the quarries of which I visited some years ago; they are at Macael, between Lorca and Baza. There is good quality white marble in Trazos Montes, Portugal, where an enterprising company ten years ago quarried £20,000 worth without any prospect of getting the blocks away, and there they are now. France has white marbles at St. Beats, but there is little demand for them, although there is a considerable duty on foreign produce in France. Norway has extensive deposits, but very little of it is good. Some was used for ashlar at the Junior Constitutional Club, and it seems to be standing very well. The finest quality is at Velfjord, where it is only about 100ft. off very deep water for shipping. There is, further north, a crystalline white marble, which is a dolomite. The late war of the Greeks and Turks would seem to have enriched the Athenians, for they are pulling down their old buildings and erecting lofty Pentelic marble ones in their places. They are full of architectural detail, which is very well done. The marble is chiefly obtained from the south or Athens side of the mountain, near the ancient workings. A company is now working the north or Marathon side. I have examined the different quarries very carefully, and am of opinion that they are the same beds as the south side, but the famous old cave statuary is not yet found. They are extracting large blocks, some of which are being used in the safety repairs of the Parthenon. My firm, Messrs. Farmer and Brindley, are working blocks of this marble which those interested can see. It is considerably harder and more costly to work than Carrara.

Quarrying.

In marble quarrying considerable skill and judgment is required; the mass of rock is rarely solid enough to be stepped down as in ordinary stone quarries, and blasting cannot be employed, except for clearing away masses of inferior material. The colouring and marking of such marbles as Pavonazzetto does not extend through the face of the rock, but is a veined mass or bed in the statuary formation, the same quarry producing first and second quality statuary and first and second Pavonazzetto. The system is, when a choice solid mass is found, to work away from the top and sides all inferior rock round the good mass; it is then sawn or wedged into blocks as large as can be obtained free of shakes. A few months ago I saw in the quarry of Crestola a solid mass so cleared of about 100 tons, worth over £1,000 sterling. The removal of the blocks when quarried is done in a very skilful manner by a specially trained group of workmen, and it is surprising with what ease and rapidity they will remove blocks, often 25 tons in weight, from the quarries and down a steep declivity to the loading place, where they are taken away on a specially built truck drawn by sometimes as many as thirty-six oxen. There are no lifting cranes in the quarries—only crowbar levers are used. The men get round the block, each with his lever, and they all lift at the same instant, the signal being given by a lively sing-song. The blocks are lowered down the mountain-side by means of ropes passed round posts. The block, being on a sort of sleigh, is slid over hardwood sleepers greased with a bar of soap. A man rides on the block, and passes the sleepers given him from behind to front. The old Rhondona and Breche Violetts are usually underground quarryings, and extracted by the aid of long saws, a channel being cut first over the block to free it from the roof, and a chamber at each end for the men to saw in. By this means they sometimes get a block of sufficient size to produce two monolith columns 14ft. long. The red Levanto Breccia and Genoa green is also sawn out of the rock. The re-found Verde Antico of Thessaly is a hard Breccia of greens, greys, and whites. The quarrying of this is by the aid of the wire saw, which is a three-strand endless steel cord of over 2,000ft. in length running over descending pulleys, and being fed with sand and water: this cuts the marble. This method of extraction is the latest and most improved, as it in no way injures the marble. It was from the quarries of Synada, in Asia Minor, that the Romans got their beautiful red purple veined Pavonazzetto, and all other sorts of this marble; these quarries also produced beautiful pure white statuary, and a rare variety of delicate flesh tint. The antique marbles, Numidian Yellow, Laconian Red, Thessalian Green, Africano Breccia, Carystian Cippollino, Egyptian Porphyry, Laconian Serpentino, Breche Universal. These are unique and have no modern representatives. Unquestionably the best yellow marble known is the Giallo Antico of the Romans. The columns of the Arch of Constantine, which were Trajans, and half those of the Parthenon, are of this marble. It varies from deep ochre yellow, to pale and a delicate rose colour; its markings are red and blue purples, the grain is crystalline, and it is translucent. This is the marble found in the encrustation of the palaces of the Cæsars, the baths of Carracalla—in short, it was the only yellow used in old Rome. The quarries, which are very extensive, are in Tunis, near the frontier of Algeria; they were extensively worked about fifteen years ago by a Belgian company, which failed owing to having an engineer as chief of the quarries instead of a practical quarryman. The next in quality is the yellow of Siena, which is familiar to all. The best quality of this yellow is now not obtainable. Beautiful panels are often seen in old Adam's chimney-pieces. The South of France, Spain, and North Italy produce about a dozen yellow varieties, but they are all inferior in quality to the two first named. The coloured marble most used by the Romans was the Carystian (Cippolino) from the island of Eubœa; there was more of this used in Rome than all the other colours added together. The first reason may have been owing to the immense size monoliths could be got as supports for their porticos and basilicas, but great quantities were also used for decoration, as it opens out well into chevron pattern more beautifully than any other marble. There are dozens of old quarries on the Island that have been examined by French, Germans, and Italians, during the last twenty years for the purpose of reworking, but in all cases it was found that the Romans had taken all the good stuff away. About four years ago a mountain that slopes down to the sea, and away from any mule track, was found on its sea face to have a large number of old quarries. These contain an almost inexhaustible quantity of first class marble, which can be got in large sizes. These quarries I am now working, and those interested can see monoliths made of it, some 14ft. long, for the new Roman Catholic cathedral at Westminster, and you will also see it at the Royal Academy in the vestibule improvements. Some twenty years ago a Swiss Cipollina was found, with colourings very similar to the old, but with very different markings, as it does not produce, when opened out, grand patterns, and, although it stands well in detached monoliths, experience proves it will not stand on new walls or floors.

Onyx Marbles.

Some thirty years ago a very extensive deposit of arragonite was found near Tlemcen in Algeria; the old quarries were here from which the Moors obtained this beautiful marble so plentifully used in their mosques at Tlemcen. The purchaser of these quarries was Signor Del Monti, an Italian resident at Oran, and he it was who for commercial purposes named the material onyx, from its translucency, like the finger nail. The misnomer "took on," and is now generally applied to all this class of very translucent marbles, some of the most beautiful of which have of late years been found in Mexico and in South America. Just recently it has been found in the Caucasus. The name onyx appears very appropriate, but it would be better to call it lime onyx, so as not to confound it with onyx proper, which is silicious. The formation of this material is most likely a deposit from hot springs, such as now goes on at several well-known springs in different parts of the world. The rock Oriental alabaster was used extensively by the Egyptians, of which the most exquisite example is the famous sarcophagus in the Sir John Soane Museum. The Egyptian quarries are in the eastern desert, and they were reopened and extensively worked by Mahomed Ali for his great mosque at Cairo. The beautiful monolith columns, which support the baldachino over the high altar at St. Paul's, outside the walls of Rome, were presented by Mahomed Ali. This Arragonite marble is produced chiefly by the lime water droppings from the roofs of caves forming stalactite and stalagmite. A short time ago, I visited some very interesting deposits in Traz os Montes, Portugal; one very large cave had a floor thickness of some six feet, with hundreds of stalactites actually extended until they were engaged to the floor mass, forming a labyrinth of natural columns, and other caves had become completely filled up, so that blocks of very large size could be extracted quite sound. Last year also was discovered at Amiato the quarries that supplied Rome, Siena, and Naples with the brown, yellow, and honey varieties. The colouring of these marbles is usually iron in solution. As beautiful as the Mexican varieties of onyx are, they are rarely successful when used in Architecture, for wall surfaces, or mouldings. For articles of virtu as room embellishments with ormulu, as used by the French, they are a decided success. With the yellow and brown variety, which is less translucent, as seen in the Paris Opera House, there is not the same difficulty in using.

Serpentines.

The serpentine marbles of which we have extensive and massive rocks at the Lizards, in Cornwall, and Banff, in Scotland, although beautiful, have never proved of much architectural value, chiefly owing to the thin veins of steatite containing iron pyrites, which expand when exposed, and cause the work to split up. It was used considerably thirty years ago in Gothic work, and several good fonts were made. There is no doubt the broader and simpler the material can be treated, the better. The French would seem to have been more successful than we have with this our own material, as there is in Paris an important front near the Place de l'Opera which is certainly very good and is standing well. The massive architraves to the doorways of the old museum in Berlin, by "Schinkel," are made in a grey-green serpentine very dark in colour. These large doorways are grand and impressive. France is very rich in coloured marbles, the most important being those of Sarrancolin, the reds of Cannes, near Carcassoune, and the yellows of the Jura and Du Var. The quarry of Bianco, Nero Antico, provided large quantities for the use of the Romans, as did the mottled reds and greens of Campan, and the green of Maurin. It would be wearisome to enumerate those of France; there is a complete series of 700 cubes in the National School of Public Works in Paris. Algeria is famous for rich reds. Those of Oran and Chennoua are the best; the latter were used in our National Gallery. Spain has also grand marbles; a good collection of these, which number about 250, will be found in the Mineralogical Museum of Madrid. Portugal has famous quarries of rose colour, near Cintra.

British Marbles.

You are all familiar with our beautiful Devonshire red and grey marbles, of which there are a considerable variety, many of which are sound and good, and far superior to the Belgian reds, but owing to heavy railway rates cannot compete at all in price. The same remarks apply to the Derbyshire and Staffordshire ones, which have almost gone out of use. This is sad, when we consider the first marble mills in this country were those of Ashford, near Bakewell. Ireland has good marbles, too; the Connemara green is unique, and the black is excellent, but still the carriage and bad quarrying prevent their use. The fact is that more beautiful foreign marbles, owing to water carriage, can be got into London for as little or less cost than our own. It is pleasing to know that England has always held her own in marble work. I do not think anything can be found better done or more difficult than our old Purbeck, Early English, and Early Decorated work. You will call to mind Westminster Abbey (with its Chapter House and tombs), the Temple Church, Salisbury and Lichfield, and Royal tomb of Edward II. at Gloucester, the shrine of St. Alban, the Grey monument of York, and the elaborate Bishop's tomb, at Rochester.

(*To be continued.*)

Theatre for Hampstead.—The Theatres Committee of the London County Council have passed the plans for a theatre to be erected at South End Green, Hampstead.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"*Great edifices, like great mountains, are the work of ages. It is frequently the case that art changes while they are still in progress. The new art takes the structure as it finds it, incrusts itself upon it, assimilates itself to it, proceeds with it according to its own fancy, and completes it if it can. The thing is accomplished without disturbance, without effort, without reaction, agreeably to a natural and quiet law. Certes, there is matter for very thick books, and often for the universal history of mankind, in those successive inoculations of various styles at various heights upon the same structure. The man, the artist, the individual, are lost in these vast masses without any author's name; while human skill is condensed and concentrated in them. Time is the architect, the nation is the mason.*"—VICTOR HUGO.

London's New Theatre. ON one of our inset pages this week we give a perspective of Mr. Charles Wyndham's new theatre in Charing Cross Road, to witness the opening of which on Thursday next with "David Garrick" such high prices for seats have been paid. The entire proceeds of the first night will be devoted to the Soldiers' Wives and Families branch of the Mansion House Fund. The new theatre has a frontage of 84ft. and the distance from the pavement to the parapet of the centre block is 51ft. The front need not be described as the illustration will supply all the necessary details; it may, however, be mentioned that the exterior is of plain stone. The entrances on the right hand side are for the reserved parts of the building, on the left there is a special door for royalty and persons of distinction, while in the middle are the exits for the unreserved parts. Though the interior is small, it is cosy and neat, and has been tastefully decorated, a great deal of fibrous plaster being used, as in other theatres. The marble staircases will doubtless look very handsome when everything has been cleaned, though at the time of the visit of our representative the workmen were busy adding the finishing touches, and their rubbish still remained. The dress circle will hold 150 persons and the width of the auditorium is about 54ft. The inside decorations are in the Louis XVI. style and the tints used are delicate and blend well together; around the walls on the ground floor there is a dado formed with marble slabs, above which is a light blue paper with a straight white pattern on it. Of boxes there are a dozen, and though these are very elaborate, the attention bestowed on them has not prevented the gallery and pit being well looked after, for the seats here are spacious and there are no columns to obstruct the view of the stage. The proscenium is 26ft. across, and is surmounted by a moulding containing figures holding medallion portraits of Goldsmith and Sheridan. There is sufficient height to allow the scenery to be lifted without rolling. The roof garden, of which so much has been heard, will not be ready till next summer. It is 54ft. wide by 44ft. long, and will be reached by a lift from the entrance to the stalls. We think that Mr. W. G. R. Sprague has succeeded better with the inside than with the outside of this theatre.

No. 17, Fleet Street. THIS house which is on the south side of Fleet Street, and adjoins Child's Bank, has come into prominence of late, because it is about to be pulled down and rebuilt. There is an inscription on the front which falsely proclaims it to have been the palace of Henry the Eighth and Cardinal Wolsey; in reality it was once the Chancery of the Duchy of Cornwall, and appears to have been built between the years 1610-12. In all probability it is the work of Inigo Jones, who, on the creation of Henry, the eldest son of James the First, as Prince of Wales in 1610, was appointed surveyor of the Works of the Prince's household, and would presumably carry out any work required for the Prince as Duke of Cornwall. It is known that the Duchy of Cornwall had offices in Fleet Street, and on one of the coffers of the ceiling of the first floor can be seen the Prince of Wales's Plume, with the initial of Prince Henry; this clearly identifies the room on the first floor as the council chamber. The plume also appears on the panels on the front of the house. The gateway to the Inner Temple which passes under the house appears to have been built at the same time and to have formed part of the house, a characteristic ornament on the front of the house being repeated on the pilasters of the gateway.

Glass Tests. PUBLICATION No. 30 of the British Fire Prevention Committee gives some interesting particulars of tests made with fire skylights glazed by the British Luxfer Prism Syndicate, Ltd., of London. The prisms were 4in. square, framed with a copper border, and fixed to T-iron skylight bars 1¼in. square, with teak cover fillets on top; each skylight showed glazing measuring 1ft. 8in. by 3ft. After being under test for twenty-two minutes the prisms began to crack and the cover fillets caught fire. Water under pressure was then turned on for two minutes and the fire skylights were bulged up about 2in. in the centre, but the prisms remained in position, though cracked by the heat and water. By about fifty minutes after the fire was started, all the skylights except one had fallen in and the fillets were well alight. Tests made with three casements glazed with wired glass by Messrs. Pilkington Bros., Ltd., of St. Helens and London, are described in No. 31 of the Committee's publications. Each casement showed 2ft. 9⅞in. by 3ft. 11½in. of glazing in the clear. After one minute the glass commenced to crack in various directions, but no smoke or flame came through; in twenty-eight minutes the teak frames were alight on the outside; in thirty minutes the glass in the centre casement began to buckle and let the flames through, and shortly afterwards began to fuse and bend downwards; and after the test had lasted forty-nine minutes the glass in all the casements was doubled in various shapes, though not broken. The photographs which illustrate the committee's reports are extremely interesting and well printed.

The Crystal Palace Roof. CONSIDERING that the Crystal Palace was originally intended to be only a temporary structure, it has weathered very well, and it is, therefore, not surprising to learn that part of the roof, which is probably the largest of its kind in the world, required renewal. The work on the centre transept is now being completed, and has proved no light task for Messrs. Mellows and Co., of Sheffield, because it is carried on at a height of 161ft., and covers something like two acres. It involves the use of 100 tons of glass! The total glass area of the Crystal Palace roof is between fourteen and fifteen acres. In the interval since Sir Joseph Paxton first put up the building in Hyde Park, in 1851, the world has made great advances, but it is chiefly in regard to materials that the great designer is shown to have been lacking. For instance, he introduced into his plans the ridge and furrow system of glass-roofing, the result of which is that hailstones rarely strike the Crystal Palace except at a harmless angle. This system, which has enabled the building to weather many a severe storm, has not been improved upon. But, in the matter of glass, Sir Joseph Paxton was at a disadvantage. Forty-nine inches was the extreme length which the manufacturers of half a century ago could produce, and by that factor, it is stated, the relative dimensions of the Palace were mainly determined. To-day there is practically no limit in the matter of size or weight of glass, while the art of glazing without the aid of putty has long since come to stay. The result of these present-day facilities is that a very light yet substantial roof will shortly span the whole of the transept, and, while the workmanship is modern, in the best sense of the word, the harmony of the general design is in no way interfered with. Some £12,000 have been spent on the work, and eventually this sum will be considerably increased. The two naves are to have a new roof. Sir Douglas Fox and Mr. V. B. D. Cowper are the consulting engineers.

The British Association. IT has been suggested from time to time to that great body the British Association, that they should occasionally take a bigger sweep and go outside the United Kingdom to hold their annual meetings. As a result the scientists have met twice in Canada, and now it is stated that the council have received an invitation to hold their meeting at an early date in Ceylon. It is, however, very improbable that the council will see its way to accepting the invitation. The time required for the double journey would be an obstacle to the attendance of many members, so that nothing like a full meeting could be expected, while the period of year at which the association usually assembles is also a serious consideration in connection with a proposal for its going to a tropical climate. While, however, there is no immediate prospect of the British Association leaving the United Kingdom, it is very probable that a visit to Ireland may be arranged for the year 1902.

Pre-Historic Egypt. IT was stated last Friday evening at the general meeting of the Egypt Exploration Fund, that the work of the season now beginning would include the protection of some portions of the great temple at Deir-el-Bahari, and it was hoped that the task would now be completed. Professor Flinders Petrie had been expected to speak, but he was kept away by illness. He sent, however, a paper describing the work of exploration at the great cemetery of Semaineh, near Abadiyeh, and afterwards at Hu, the ancient Diospolis. From the order of the graves as found by the pottery, he had obtained the history and the development of stone vases, ivories, and the working of flint and metal—for even the earliest of the tombs contained copper. One of the most curious differences found in connection with the pre-historic age being studied was, that the older people largely used signs which were the forerunners of the Mediterranean alphabets, while the later people ignored such signs. The characteristic pottery of the earlier people was closely like the Kabyle pottery at present; the later people had some pottery almost identical with that of South Palestine in historic times. All these indications pointed to the earlier being a Libyan population, overlaid later on by an Eastern migration. These results had only been reached in the last few week.

Royal College of Music. THE foundations of the new concert hall at the Royal College of Music at South Kensington (an interior perspective of which is given on one of our inset sheets) are already completed, and the superstructure is now in course of erection by Messrs. Bywaters and Sons. The examination rooms are under the hall, while at the rear are the boiler house, store rooms, &c. At the side and at the platform end are the dressing-rooms. The concert hall will have seating accommodation for 1,200 persons, and the orchestra is specially arranged for rehearsals by the students. At the rear of the orchestra a large organ will be provided. The building outside will be faced with red brick, having buttresses to relieve the walls of the weight of the roof, the span being 58ft., and the hall 120ft. long. The inside will be treated with decorative plaster, and the ceiling done entirely in fibrous plaster, with pierced panels for extract ventilation, the roof inside having a ventilating trunk with ventilators at intervals. Mr. Sidney R. J. Smith, F.R.I.B.A., of 14, York Buildings, Adelphi, W.C., is the architect. His design was placed first in the limited competition for which Mr. Belcher was the assessor.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

R.I.B.A. INTERMEDIATE.

In reply to "F. O.," Halifax. (1) A design for a boathouse is published in The Builders' Journal for December 30th, 1896. (2) A list of books suitable for preparing for the R.I.B.A. exams. can be obtained from the Secretary, 9, Conduit Street, Regent Street, W.

BUILDING RIGHTS.

W. G. (Wilts) writes:—"A has a building with the eaves gutter overlapping B's property. B wants to build up against A's wall, and carry his wall somewhat above A's eaves. Can A prevent him doing this?"

If A's gutter has been in existence for nineteen years and a day, it may not be interfered with, an easement having been acquired. If it has only existed for a shorter period, it may be dealt with as suggested. In either case, a friendly arrangement had best be come to, and reduced to writing with the aid of a solicitor, so as to avoid the acquirement of further easements, such as right of support, by either party after the lapse of another nineteen years and a day.

G. A. T. M.

CHARGES FOR WALL PAPERING.

Yawless (Clapham, S.W.) writes:—"Will you kindly inform me if the term "paper walls" in a specification would include French wall papers. I have been told it does not. Also, can I charge the extra pieces of paper required, owing to it being a different measurement?"

It would depend entirely upon the exact wording of the specification; but taking a common-sense view of the matter it seems as if French papers, if selected, would have to be supplied up to the value per piece mentioned in the specification, but that an extra charge might be made for the additional number of pieces required. As English papers are almost invariably used, the estimate was naturally based upon the usual English sizes.

G. A. T. M.

POWERS OF LOCAL AUTHORITIES.

E. J. E. writes:—"Can an Urban District Council prevent the erection of a stable or other building which is intended to be built with galvanised iron, and which would be an annoyance to the people residing near, on account of its unsightly appearance? Does a stable come under the same laws as a dwelling-house?"

An Urban District Council can prevent the erection of a building not in comformity with their by-laws; and a stable would usually come under the same regulations as a dwelling-house as regards the construction of its walls, &c. But it does not appear that any authority can prevent the erection of a building merely on the score of its unsightly appearance.

G. H. B.

LINE OF STUDY FOR A BUILDING SURVEYOR.

Enquirer (Lye) writes:—"What line of studies must be undertaken for the profession of a building surveyor? Are the terms building surveyor and architect synonymous?"

In London the callings of architect and of building (or quantity) surveyor are usually distinct, but many country practitioners, and some in London, also combine the two. Anybody intending to become a building surveyor would do best to be articled to someone practising in this way, preferably in London, but having regard to the fact that there are several systems of quantity surveying of local application only; or he might pass through the three years course of instruction in the architectural school at King's College, London.

A knowledge of planning and of architectural practice, as well as some skill in draughtsmanship, are essential.

G. A. T. M.

CLEANING BACKS OF DRAWINGS.

G. A. B. (Wolverhampton) writes:—"I have recently been finishing some drawings for the R.I.B.A. intermediate examination, and when I removed them from the board (they having been previously stretched) the backs were covered with a woody substance which I could not remove. As I consider that this would tell against the drawings in the examination, I should be very much obliged if you could tell me how to remove it. How would it do to mount them on a second sheet, and how would this be done?"

The "woody" substance referred to is doubtless some of the surface of the drawing-board which has remained on the drawing after it was taken up. This, however, should certainly not have adhered to the paper, and it is in all probability owing to the fact that the sticking paste has been put over the whole area of the paper, whereas it should only have been applied to the turned up margins. The best way to remove the substance will be either to slightly damp the paper and gently scrape with a sharp knife, or to get some fine sand paper and rub upon the surface until it is removed, care being taken not to penetrate the paper in any way. When it has all come off, it is probable dirty marks will remain; another piece upon the back of the first should now be stuck on. This can be done by damping the back of the first with a sponge, care being taken not to get it too wet. Also wet one side of the piece to be applied, then with a large paste brush thoroughly rub over the dry side of the second piece with starch dissolved in water. Take it up by two of its corners and lay it on the first. Smooth these over with a handkerchief, see that no air remains between, put them under a press or a heavy weight, and leave for twenty-four hours. No fear need be felt that the marks on the back of the paper will disqualify his drawings.

H. F. W.

BUILDING FRONTAGES.

Alpha (South Tottenham, N.) writes:—"I am desirous of building one shop fronting an old road abutting on my estate (which has no restrictive covenants). The nearest house is 100ft. from the proposed building, and is set back 15ft. from the road. Can I build up to the front line, or must I set back? The site is situated in an urban district, and the width of the road opposite the proposed shop is 40ft. I am informed that the Bristol decision would enable me to build out to the front. Can you give me the date of this case and your opinion?"

Section 3 of the Public Health (Buildings in Streets) Act, 1888, prohibits the erection, in any urban district, without the written consent of the urban authority, of any building in any street beyond the "front main wall" of the building "on either side thereof in the same street." The house mentioned by "Alpha" as being 100ft. away from his proposed building appears to be "in the same street" for the purposes of Section 3, but whether it is near enough to be "on either side" for purposes of the same section is a difficult question to decide. The "Bristol decision" to which "Alpha" refers, is probably in the case of *Attorney General* v. *Edwards*, tried in December, 1890, and fully reported in the Law Reports of the I.C.L.R., Chancery Divison, 1891; Vol. I., p. 194. In that case it was held that, in considering which is the "front main wall" of a building, and whether such building is "on either side of" or "in the same street" as a building in course of erection, all the circumstances of the case must be taken into consideration. A particular wing or other projection must not be treated as the "front main wall" which is to give the governing line, nor are two buildings necessarily "in the same street" because one faces the same street, or a continuation of the same street, as the other That case does not appear to be quite on all-fours with "Alpha's," which seems a case to be also decided upon its merits.

G. H. B.

New Patents.

These patents are open to opposition until December 18th.

1898.—Radiating Device.—17,438. R. C. Ayrton, Coventry. This invention consists in covering the radiating body, whether of iron or steel, with gills or wings of metal of higher conductivity, such as aluminium, silver, or some alloy of these.

Urinals.—21,019. M. J. Adams, Leeds. Instead of the back being semicircular or angular from the floor upwards, only the lower part is like this, the top part being square or rectangular. This enables the capping to be much lighter and neater.

Levelling Staff.—21,886. A. H. Mountain, Withington, Manchester. The staff is in three parts, the middle and bottom parts being hinged together, and the top part made to slide in a dovetail groove in the middle part. When extended, the parts are held stiff by putting pins through eyes on the hinges. The graduated face of the staff is thus prevented from injury when not in use, and the staff is made more portable.

Combined Centrolinead and T-Square.—22,740. B. Hibbert, London, S.W. This instrument is for drawing the vanishing and (with the aid of a set square) vertical lines of a perspective. It consists of a straight edge about 3ft. or 4ft. long connected at one end to the centrolinead; this has two long arms of equal length jointed in the middle, and attached by two short arms to a nut on a centre bar. Two box knuckle hinges are attached to the drawing board with pins, and have studs between which the arms of the centrolinead work. When pulled one way, the arms become straight and the instrument acts like a T-square, and, when pulled the other way, the arms become angular and enable lines to be drawn that would meet at any desired distance away from the board.

Gate Stops.—22,742. D. Fletcher, Norton. The stop consists of a box containing a system of levers which are operated by the closing of the gate, causing the stop to shoot up above the ground or pavement level; when the gate is opened, the projection drops back again. An automatic slide is provided to prevent dirt getting into the device.

Wood Sawing Machinery.—22 792. J. Kershaw, Hebden Bridge. Rocking arms are employed, hinged on short horizontal arms near the bottom of the bench, and connected with gear for operating and adjusting the feed mechanism. By this method of tilting any angle of feed may be obtained, and can be maintained, whatever movement may be given to the rocking arms by varying thicknesses of timber.

Casements.—23,294. J. W. Moseley, Sale. Within the casement frame, top and bottom, are a pair of hinged arms, and to the ends of these the casement proper is centrally pivoted. By this means the casement can be swung outwards bodily, and revolved for cleaning purposes. No rain or moisture can get in through the joints.

Transporting Bricks.—24,188a. M. Villaret and J. B. Wahlen, both of Germany. The main frame of the truck is made turnable on a horizontal axle, the sleeves swing vertically, and means are provided for lifting and lowering the shelves. The truck can thus be run through the low doors of brick kilns, and the frame can be changed from a horizontal to a vertical position without upsetting the bricks.

Water Closet Seats.—25,565. M. Page, East Ham. At the back of the seat there is a reel of paper (perfumed, disinfected or decorated) of the same width and shape as the seat. It is perforated at intervals and lengths are torn off after use. The invention is particularly adaptable to water closets at railway stations, public conveniences, &c.

Drain and other Pipes,—25,618. R. Whichells, Newcastle-on-Tyne. To prevent the adhesion of solid matters, the pipes are of glass and have an outer coating or casing of cement.

Incandescent Gas Burners.—26,665. J. Jackson, Coventry. The crutch that supports the mantle is held in place by a spring, or set screw, and its position can thus be regulated in order to obtain a maximum incandescence.

1899.—Syphon Cisterns.—8,981. J. W Hancock, senior, Leicester. The inlet end of the syphon is much larger than the outlet, to allow a perforated plate to work up and down inside it. The plate is connected to a rod outside the syphon, attached to a chain-actuated lever. Over the plate is a disc valve. When the lever is pulled down the perforated plate rises and lifts sufficient water to charge the syphon, and so start the flush.

Cements.—12,871. W. Borgolte, senior, Höxter, Germany. The following materials are mixed and burnt in a closed kiln: Limestone, 2 parts; one part each of clay, clay-marl, alumina, and ground coal; and 2 per cent. of a hydro-carbon, such as tar, paraffin, &c. The product obtained is broken and ground, and gives a good glazed cement.

Enamelling Bricks.—15,804. E. P. C. Willems, Schelle, Belgium. The enamel consists of: Silica, 36 parts; alumina, 10 parts; alkaline matter, 7 parts; and metallic oxides, 47 parts. Oxide of tin produces white enamel, oxide of cobalt blue enamel, and oxide of iron black enamel.

Ventilators.—16,365. H. and A. H. Ough, London, E.C. The air is admitted through air bricks or gratings into a chamber containing a screen of butter-cloth or netting which filters it. Beyond this is an adjustable slide. When dirty, the filtering material can be changed.

Fireproof Floors.—16,589. A. H. Bromley, junior, Philadelphia, U.S.A. Ready-made centres are used composed of plaster of Paris combined, if necessary, with papier maché, hair, excelsior, or burlap. They are made without dies or presses.

The following specifications were published on Saturday last, and are open to opposition until December 25th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—20,516, Adams, means and appliances for opening, closing, regulating, and fastening, at any required angle, swing windows, doors, ventilators, fanlights, &c. 24,294, Bennett, manufacture of tiles, bricks, &c. 24,861, Webster, safety devices or guards for circular saws. 25,093, Hannay, swing gates. 25,266, Powey, construction and working of joiners' and engineers' vices. 25,623, Ransome, band-saw machines. 25,746, Christy and Christy, means for electrically heating ovens, hot chambers, rooms, &c. 26,298, Parkes, manufacture of the eyes of hoes, picks, &c. 26,318, May, sliding bolts or bars for fastening doors and apparatus connected therewith. 26,644, Putzeys, pipejoints. 27,000, Sachs, stage floors. 27,146-7, Hervais, drawing pens.

1899.—3,207, Kind, bath and lavatory grating. 6,981, Hett, surveyor's level of the suspended mirror type. 11,838, Todtenhagen and Lemke, radiators or heating pipes for application to stoves, &c., closed fireplaces. 16,212, Burkert, incandescent gas burners with automatic ignition devices therefor. 16,633, McClelland, sand moulding machine. 17,000, Drinkwater, nut locks. 17,241, Langner, mortising or similar machine. 17,431, McKial, sash fastener. 17,591, Gans, blowing or ventilating fans. 17,964, Hadden (*Fugman*), fireproof construction for buildings.

The Organ Case at Westminster Abbey is now complete, and proves a splendid piece of designing and carving. It will be remembered that about £1,400 was raised at the Purcell Bicentenary celebration for the case on the north side over Purcell's grave. The south front was afterwards added in memory of Mr. A. D. Clarke, the munificent donor of the celestial organ; and now the south side has been completed at the expense of the Dean and Chapter.

Keystones.

Devizes Castle, Wilts., built in 1132, is for sale.

A Fine Art and Industrial Exhibition at Newark has been opened.

The Beckett Hospital at Barnsley is proposed to be enlarged at a cost of about £5,000.

Ferdinand De Lesseps' Statue at Port Said is to be unveiled on November 17th, the Khedive of Egypt presiding.

New Board Schools near Haworth have been erected at a cost of about £6,700 from designs by Mr. E. P. Peterson, of Bradford.

The Vaults of St. George's, Southwark, have cost £2,500 to clear; the remains of 1,419 persons have been removed to Woking.

The Church of St. Mary Bredman, Canterbury, is to be pulled down, as its present dilapidated condition makes it a danger to the public.

The New London Hippodrome in Cranbourne Street, Charing Cross Road, is to be opened on Monday, December 18th. Mr. Frank Matcham is the architect.

Dundee Institute of Architecture.—A paper on "Art in the Home" was recently read by Mr. P. H. Thomas before a meeting of the student's section of this institute.

A Memorial to General Sir Penn Symons, who died of his wounds after the battle of Dundee, is proposed to be erected in the parish church of Bothusfleming; a memorial at Saltash, and some token of a national character, are also contemplated.

Church Moving in Glasgow.—St. Bride's Episcopal Church in Beaconsfield Road, Kelvinside, was recently raised by "jacks," mounted on wheels, and removed bodily to a site in Hyndland Road, about a quarter of a mile distant. The church is built of wood, is about 50ft. long, and weighs about sixty tons.

A New Polytechnic Institution.—The Hornsey District Council have decided to present to the Technical Instruction Committee of the Middlesex County Council a freehold site for the erection of a polytechnic institution. The site is close to the free library, fire and police stations, at Tottenham Lane.

Chichester Cathedral.—In consequence of the death of Sir Arthur Blomfield, the sub-committee appointed to make arrangements for the holding of a meeting in Brighton on November 22nd in furtherence of the restoration of the Cathedral at Chichester, have determined that the proposed meeting must be abandoned for the present. Sir Arthur Blomfield was the architect to whom the work had been entrusted, and he was to have been present at the meeting to explain his plans.

How to Paint a Picture.—A Mr. Hay, of Hull, wanted a picture of "a really beautiful lady," and for this purpose he sent to an artist a "Maid of Athens face, from a picture published by Longman's; hair from the Parisian Diamond Company's advertisement, body from Dickens and Jones's advertisement, and bust from the Duchess of Teck." With this material the artist was to paint the picture. He did so, but Mr. Hay was not pleased, and the Judge decided in his favour recently at the Westminster County Court, where the artist seeked to obtain £1 3s. 2d. more than the £10 he had already received.

Royal Scottish Academy.—At the annual meeting of the Royal Scottish Academy last week the following office-bearers were elected for the ensuing year: President, Sir George Reid; council, Messrs. G. Ogilvy Reid, J. Campbell Noble, W. D. M'Kay, W. Beattie-Brown, Robert M'Gregor, J. Lawton Wingate; secretary, Mr. George Hay; treasurer, Mr. John Hutchison; auditors, Mr. P. W. Adam and Mr. W. Beattie-Brown; librarian, Mr. W. D. M'Kay; curators of library, Mr. G. Ogilvy Reid and Mr. Robert M'Gregor; visitors of the life school, Messrs. J. Campbell Noble, W. Grant Stevenson, G. Ogilvy Reid, and Alexander Roche.

A new Board School at Bromley, E., has been erected at a total cost of £41,000.

A Working Men's Institute at Seaton has been built from designs by Messrs. Donald and Tate, of Workington and London.

The Dollis Hill Estate will be converted into a public park as a memorial to Mr. Gladstone. The purchase money is £50,000.

St. Anne's Roman Catholic Cathedral, Leeds, is proposed to be removed to make way for street improvements. It occupies a prominent site in the centre of the city in Cookridge Street.

Whitefield's Tabernacle, Tottenham Court Road, W., just completed, is a red brick and white stone structure, designed by Mr. Rowland Plumbe, who describes its style as "a Victorian rendering of Free Renaissance of the Netherlands."

A New Methodist Church at Belfast is being built on the Oldpark Road from the designs of Messrs. J. J. Phillips and Son. It is 90ft. long and 48ft. wide inside, and will accommodate about 800 persons. The estimated cost of the work is £3,000.

A Royal Palace for Sale.—The Crown lease of Eltham Court and Palace is advertised for sale. Its history dates from the time of Edward the Confessor (1042-66); though the date of its erection is uncertain, it is known that it was a royal residence from 1270 to 1628.

Plumstead Competition.—The authors of the three premiated designs for the proposed municipal buildings and public library at Plumstead are as follows: 1st (No. 3), A. Brumwell Thomas, 7, Queen Anne's Gate, S.W.; 2nd (No. 30), Messrs. Hall, Cooper and Davis, 21, Old Queen Street, Westminster; 3rd (No. 22), Henry Ingle Potter and Sydney W. Cranfield, 19, Lincoln's-Inn-Fields, W.C.

New Companies.

General Land Investment Trust, Limited.

This company was registered on October 21st by D. C. Craigie, Balham, S.W., with a capital of £20,000 in £1 shares, to acquire any land, estates, &c., and to develop and turn to account the same by clearing, planting, draining, or building theron; as brick and tile makers, jobmasters, licensed victuallers, &c.; as dealers, both wholesale and retail, in stone, sand, lime, &c.; as producers and suppliers of gas and electricity; as bankers, financiers, company promoters, &c. The directors are R. C. and D. C. Craigie and W. V. M. Popham. Qualification, £200. Remuneration, £50 per annum each and a percentage of the profits, divisible.

Joseph Grayson, Limited.

This company was registered on October 23rd by Maffey and Co., 19, St. Dunstan's Hill, E.C., with a capital of £10,000 in £1 shares, to adopt and carry into effect an undetailed agreement for the acquisition of the business of a mahogany and general timber merchant as now and hitherto carried on by J. Grayson at Knowl Street, Stalybridge, Chester, and also at Cheetham, near Manchester; to develop and extend the said business, and generally to carry on in all or any of their respective branches the businesses of timber merchants, sawmill proprietors, saw-millers, mechanical engineers, builders and contractors, brick and tile makers, plumbers, &c.

C. O. Fison, Limited.

This company was registered on November 2nd by Tamplin and Co, 165, Fenchurch Street, E.C., with a capital of £10,000 in £10 shares, to acquire the business carried on at Stowmarket, Suffolk, and elsewhere as C. O. Fison, to adopt an agreement with C. O. Fison, and to carry on the business of brick, tile, and pottery manufacturers, quarrymen, &c. The first directors (to number not less than three nor more than five) are S. T. Harwood, W. C. Prentice, and S. Prentice. Qualification, £10. Remuneration as fixed by the company. Registered office: Stowmarket.

COMING EVENTS.

Wednesday, November 15.

Society of Arts.—Opening Meeting of the Session. Address by Sir John Wolfe Barry, K.C.B., F.R.S., Chairman of Council. 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting at 8 p.m.

British Archæological Association.—Meeting at 8 p.m.

Sanitary Institute.—(Lectures and Demonstrations to Sanitary Officers.)—Mr. W. Hunting, F.R.C.V.S., on "Signs of Health and Disease in Animals destined for Food, when alive and after slaughter. Tuberculin and other tests." 8 p.m.

Northern Architectural Association.—Opening meeting of session; address by the President, Mr. William Glover, F.R.I.B.A. 7.30 p.m.

Thursday, November 16.

London Institution. — Mr. George Langley on "Music in its Relation to Painting and Poetry." (Illustrated.) 6 p.m.

Institute of Sanitary Engineers (Incorporated.)—Mr. James Ashton on "Treatment of the Sewage of Wigan" 8 p.m.

Worshipful Company of Carpenters.—(Lectures on Sanitary Building Construction at Carpenters' Hall, London Wall.)—Mr. James Bartlett, M.S.A., on "Setting out Work, and By-laws." 7.30 p.m.

Arts and Crafts Exhibition Society (Lecture at the New Gallery, Regent-street, W.).—Mr. Halsey Ricardo on "The Gothic Revival." 8.30 p.m.

Royal College of Art, South Kensington.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: the Bones and Muscles of the Trunk, and their Surface Forms."

Friday, November 17.

Architectural Association.—(Discussion Section.)—Mr. Robert Williams on "Tenement Houses for the Working Classes." 7 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. W. Hunting, F.R.C.V.S., on "The Names and Situations of the Organs of the Body in Animals." 8 p.m.

The London School of Economics and Political Science.—Mr. Hirst on "Recent developments of the Law Relating to Drainage," II. 7 p.m.

aturday, November 18.

Dundee Institute of Architecture, Science and Art.—Visit to Villa in West Ferry, by permission of Mr. J. Murray Robertson. 2.5 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and Demonstration at St. Marylebone Stone Yard. 3 p.m.

Monday, November 20.

Royal Institute of British Architects. — Dr. A. S. Murray, F.S A., on "Decorative Patterns from Excavations in Cyprus in 1896." 8 p.m.

University College, London.—Dr. Samuel Rideal, on "Processes for the Treatment of Sewage."

Victoria and Albert Museum, South Kensington. —Mr. Hugh Stannus, F.R.I.B.A., on "Historic Evolution of Applied Art—VII. Greek Pre-Christian Art." 6 p.m.

Society of Arts.—(Cantor Lectures).—Mr. Henry Hardinge Cunynghame on "Art Enamelling upon Metals."—I. 8 p.m.

Surveyors' Institution.—First Junior Meeting. 7 p m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Inspection and demonstration at the Metropolitan Cattle Market, York-road, N., conducted by W. A. Bond, M.A., M.D., D.P.H. 3 p.m. Mr. Alfred Hill, M.D., F.R.S.E., F.I.C., on "The Appearance

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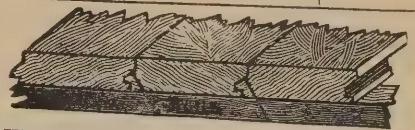

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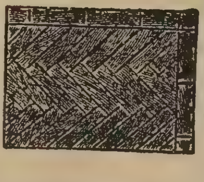

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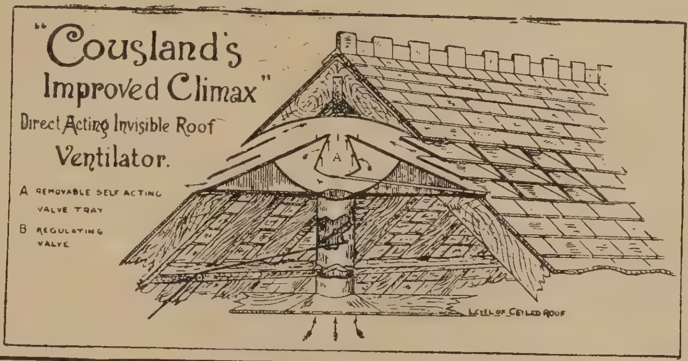
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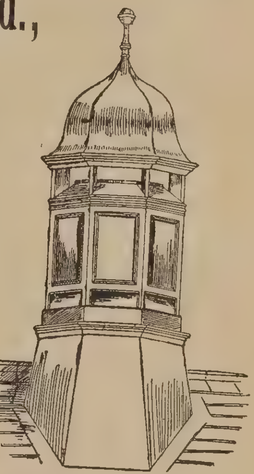

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LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Smoking concert, President's address and distribution of prizes. 6.30 p.m.

Tuesday, November 21.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. Anthony Scott, M.S.A., on "Round Towers of Ireland." 8 p.m.

GLASGOW ARCHITECTURAL ASSOCIATION.—Symposium: "Sculpture Work."

SOCIETY OF DESIGNERS.—Mr. Richard Lunn on "Design for Pottery." 8 p.m.

Wednesday, November 22.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students evening.

SOCIETY OF ARTS.—D. E. Hutchins on "National Forestry." 8 p.m.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. W. A. Bond, M.A., M.D., D.P.H., on "Diseased Meat, with a Demonstration of Morbid Specimens collected from Meat Markets." 8 p.m.

EDINBURGH ARCHITECTURAL SOCIETY.—Debate on the "R.I.B.A." 8 p.m.

BIRMINGHAM AND DISTRICT CLERK OF WORKS AND BUILDERS' FORMAN'S ASSOCIATION.—Mr. A. Freeman Smith on "Styles of Architecture." 8 p.m.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

CHEARSLEY (Bucks).—For alterations and additions to Chearsley Board School for the Chearsley School Board. Guest Luckett, architect, 2, Church-street, Aylesbury:—

Sherwin	£503	12	Blane	£359	0
B. Holland	404	0	Crook and Son, Waddesdon*	325	0
J. Holland	362	10			

* Accepted.

CLOWNE (Derbyshire).—For the erection of sixty houses. Mr. F. Cooke, C.E., 22, Leeming-street, Mansfield:—

J. F. Price	£12,700	0	0	Brassington and Bingham	£10,335	5	0
A. Eastwood	12,461	3	6	C. Houldsworth	10,113	0	0
G. Boot	12,000	0	0	Cresswell and Sewell	10,067	15	11
A. G. Bell	11,736	0	0	F. H. and J. W. Moore	9,900	0	0
E. Levick	11,344	5	10	G. England	9,900	0	0
G. Haynes	11,225	0	0	J. Wignell	9,300	0	0
W. Thomoson	11,160	0	0	W. B. Wass, Sutton-in-Ashfield*	9,009	0	0
G. R. Hall	11,102	7	6				
F. Lee	11,100	0	0				
C. G. Percival	10,800	0	0				
H. Oakey	10,800	0	0				
W. Savage	10,550	0	0				
C. E. Hall	10,500	0	0				

*Accepted.

CHESTERFIELD.—For the erection of new Central Board Schools, Ashgate-road, Chesterfield, for the Chesterfield School Board. Messrs. Tiltman and Jackson, architects, London and Chesterfield:—

James Fidler	£18,100	5	Moss & Son, Ltd.	£16,095	0
Robert Peck	17,700	0	John Wright	15,927	10
Longden and Son	17,650	0	Isaac Margereson	15,815	0
A. G. Bell	16,468	0	William Forrest	15,508	0
Kellet and Son, Leicester*	16,100	0			

*Accepted.

DOWLAIS (S. Wales).—For the erection of slipper baths and penny automatic shower baths, for the Rt. Hon. Lord Wimborne. Mr. R. Owen Allsop, architect:—

E. Jones	£1,975
J. Linton, Newport, Mon. (accepted)	1,350

FRINTON-ON-SEA.—For the erection of a detached villa on the Esplanade, for Mrs. Franklin. Messrs. Homer and Co., architects, Frinton-on-Sea:—

E. West	£1,348	F. B. Pitcher	£1,215
W. Gladwell	1,295	G. Abbott*	1,174
H. J. Linzell	1,269		

* Accepted.

FRINTON-ON-SEA.—For the erection of a villa in Fourth-avenue, for Mr. E. Spiegel. Messrs. Homer and Co., architects, Frinton-on-Sea:—

Dupont	£1,987	Linzell	£1,757
West	1,823	Pitcher	1,687

LONDON, E.C.—For addition to warehouse, Great Arthur-street, Golden-lane. Mr. J, Randall Vining, 89, Chancery-lane. W.C., architect and surveyor:—

W. Johnson & Co., Ltd.	£2,239	W. Shurmur	£1,940
Higgs and Hill, Ltd.	2,044	Patman and Fotheringham	1,891
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LONDON.—For excavating and carting at the site of the new baths, Prince of Wales'-road, Kentish Town. Mr. T. W. Aldwinckle, architect:—

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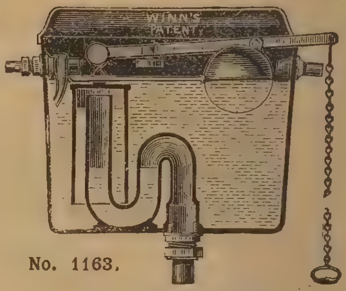

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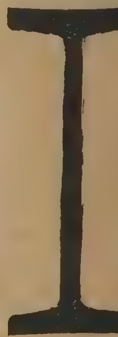

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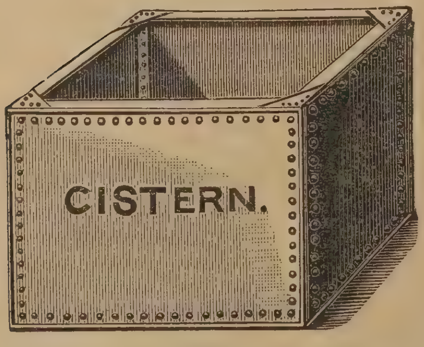

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PUMPS FOR CONTRACTORS' PURPOSES.

By M. POWIS BALE, M.I.M.E.
Assoc. M.I.C.E.

Author of "Woodworking Machinery," "Stoneworking Machinery," "A Handbook for Steam Users," "Pumps and Pumping," &c.

THE selection of a type of pump adapted to the duties it has to perform is a factor of great importance, both as regards its output, economical working, and longevity. It is a point, however, that is sometimes lost sight of, causing considerable loss and annoyance that might have been obviated by exercising a little forethought. This was recently forcibly brought before the writer when examining some steam pumps on a contractor's works that had failed through the valves and slides being cut to pieces by sand; the pumps had been improperly used to get out the water in dock foundations. Pumps employed by contractors are generally subjected more or less to rough usage, and should therefore combine, as far as possible, simplicity, strength and easy access to the working parts. Pumps of complex construction should be avoided, as although these may give higher results theoretically or under certain express conditions, as a rule they are rapidly counterbalanced by breakdown, extra cost of removals, &c.

Centrifugal Pumps.

For ordinary contractors' work, such as getting out foundations, &c., and lifting a large quantity of water to a moderate height, no other form of pump is superior to the centrifugal. It also possesses the advantages of strength and simplicity of construction, moderate first cost, little liability to disarrangement, and ease of erection and repair. Where applicable, it is the best form of pump for irrigation and drainage purposes, emptying docks, &c., as it can be readily fixed in awkward positions, and, having no valves, it is especially adapted for raising water containing foreign matter, as it will pass stones, gravel, sand, leaves, &c., that would soon choke an ordinary pump.

A well-designed and constructed centrifugal pump will discharge a larger volume of water, in proportion to the power used, than any other. It will lift well up to 20ft., but will discharge more water as the lift decreases, assuming, of course, that the speed of the pump is maintained. About 7ft. will be found an effective lift. If, however, the pump can be fixed below the water level, its speed may be increased and a larger discharge secured, but excess of speed is not desirable, as the quantity of water discharged per revolution is lessened.

The general construction of the pump is briefly as follows :—A series of curved blades or discs are mounted on a spindle and made to revolve in a cast-iron case in a similar manner to a fan blower. The revolution of these blades, aided by the pressure of the atmosphere, brings up the water, and it is upon their proper proportion, construction, and arrangement that the effective working of the pump chiefly depends.

To secure effective results, the blades must be so arranged that the water enters the pump with as little friction or shock as possible, and with this object the blades are usually made curved and fixed almost tangentially to the periphery of the pump disc. It may be as well to observe that the loss of power through fluid friction in some pumps of faulty construction is very considerable, the water being churned and eddied round during its passage through the pump, and the evenness of its flow disturbed. With the presumed object of reducing the friction of the water, in a pump of recent design the suction is arranged to enter on one side only of the disc; consequently the water is not split up, as is the case with most pumps of this type, and by removing the centre of the pump disc side thrust on the spindle is avoided. With the same object in view—namely, the reduction of the water friction—pumps are also arranged with a split or branched suction, and the water is made to enter on either side of the pump disc directly opposite its centre, forming a balanced suction.

In the latest practice the foundation of the pump with the standards for the bearings are usually cast in one piece, which gives increased steadiness in working and allows the pump case to be removed without disturbing the suction pipe. The pump casing should be so arranged that the side may be taken off to allow the pump disc to be inspected or cleansed, and hand holes should be fitted with bayonet-pointed covers placed on either side of the suction pipe, so that any obstruction may be readily removed. The curved blades or impellers should be made of steel or charcoal-iron, and, with the disc, be very carefully balanced, or the bearings will wear away rapidly and produce an uneven motion on the water. The pump spindle should be of steel, fitted with a driving pulley of ample diameter and width, and an efficient method of lubricating the bearings should be provided. To dispense with the use of the foot valve, and to save the trouble of charging the pump with water by hand, a small air exhauster is sometimes fitted, and driven from the main pump disc spindle by a belt. In the smaller centrifugal pumps the main body is often attached by a quadrant bracket to the bed plate, which allows it to be swivelled round to any desired angle. This arrangement will be found very convenient for shore work or in awkward situations; at the same time, the joints of the suction or discharge pipe need not be disturbed. The speed of the water through the pipes should not exceed 4ft. per second, as the friction in the pipes increases in the proportion of the square of the velocity.

Rotary Pumps.

Although this type of pump is not used so much as formerly, it possesses some good features. Rotary, or what may be termed revolving piston pumps, in contradistinction to direct-acting pumps, have the advantage of not changing the direction of the flow of the liquid with each stroke of the pump. They can be run at a high speed, and, having no complex valves or leather-packed pistons, cannot readily choke. It may, however, be added that water leakage is a defect found in most rotary pumps, though the efficiency is not so largely reduced as with an ordinary pump. In these cases the speed of the pump may often be increased with advantage.

An excellent rotary pump for steam or hand power, now constructed, consists of five interior parts, four being roller valves arranged to revolve on their seats, which equalizes the wear and renders the pump more water-tight. A novel form of rotary pump has recently been introduced, and appears to give excellent results. In this pump the periphery of the internal drum is divided into four spaces, the two opposite being of the same area and subject to the same pressure. The drum has four blades, which project radially from the centre at equal points, and two of these for one quarter of a revolution are in contact with the wall of the cylinder, during which time they are exposed to pressure on one side only. But during this time the only friction is that caused by the movement of the fluid; during the next quarter of a revolution the blades have an equal pressure on both sides. Each blade acts twice for a quarter of the distance at each revolution, consequently the four blades act for eight quarters, or sweep out the water space twice during one revolution. It is claimed for this arrangement that the pressure is brought into exact equilibrium on all the moving parts, thus saving the loss by friction produced in rotary pumps when the pressure is allowed to act against the side of a drum and drive it against the bearing or abutment, which acts as a brake.

A very good form of rotary pump, especially adaptable for rough work, consists inside of what may be termed a pair of very coarse toothed wheels or wings, geared into each other. The teeth fit against the outer casing of the pump, and as they revolve past the water inlet they produce a partial vacuum, which is filled with water; this is swept forward through the discharge pipe as the teeth, or wings, revolve.

Force Pumps.

When it is necessary to force water to a considerable height, plunger or force pumps must be used. These are made in great variety. For certainty in action and efficiency the writer can recommend the type known as the duplex direct acting, also the fly-wheel pump. In the duplex pump certainty of action is secured and dead points avoided by mechanically actuating each steam valve from the piston-rod of the opposite cylinder, two pumps being placed side by side. Consequently the pumps can start at any point of the stroke, and will deliver a steady flow of water. Each piston is made to pause at the end of its stroke, and the plunger of one pump commences its stroke as the other finishes. Ample time is allowed for the water valves to properly seat themselves without shock. The steam valves employed are flat slide valves, similar to those used in a steam engine, and are found to wear well and give little trouble.

Fly-wheel pumps possess some advantages over direct-acting pumps, notably in the saving of steam when they are worked expansively. Ordinary flat steam valves can be recommended for this form of pump, with the clearance and cushioning as in a steam engine.

Ram or plunger pumps will work with less friction than a packed piston, and are somewhat easier to keep in order. They are well suited for heavy pressures and for gritty water when a centrifugal pump cannot be used. Unlike the direct-acting variety, it is not necessary with fly-wheel pumps that the full pressure of steam should be used throughout the stroke, as the cut-off can be varied to a certain extent to suit the water pressure it has to work against. Again, the stroke being positive and limited by the crank, much less clearance is required in the cylinder. Piston speed of direct-acting and fly-wheel pumps, say, 50ft. to 120ft. per minute, according to duty.

Pulsometer Pumps.

This form of pump has proved itself very useful for rough work and difficult situations in quarries, shafts, &c., as it can be worked suspended by a chain, and easily raised or lowered as required. As the pump has practically no moving parts, wear is reduced to a minimum, and very little attention is required. It, however, uses a considerable amount of steam. Sand, gravel, pebbles, &c., can readily pass through without damaging or clogging the valves, a matter often of great importance in sinking and similar operations.

Steam Water Elevators.

Although wasteful of steam, these are very useful appliances for occasional duty. They operate through the suction or momentum obtained from a jet of steam, and will lift water up to about 20ft., and force about 1ft. high for each pound of steam pressure used. They may be fixed either above or below the water to be lifted.

Hand Pumps.

Many hand pumps of rough and inferior construction are made for contractors' work. A wrought-iron lift pump with a cast-iron barrel is suitable. The suction pipe should be of wrought-iron, arranged telescopically, and the rising main made of rather larger diameter than the barrel, in order that it may allow the pump to be drawn for repairs. If it is required to drive with a hand wheel, the pump rod can be brought through the top of the pump column and attached to a slotted compensating lever, which is itself actuated by a crank attached to the hand wheel. Pump valves of the clack type, made large and free, are suitable.

Chain Pumps.

These are suitable for rough usage, lifting muddy water, &c. The pump consists chiefly of an endless revolving pitched chain carrying a series of iron discs. These descend into the water, and on their upward journey pass through a tube, carrying the water with them. The pump can be adjusted to suit different depths, and can be driven by hand or power. The back fixed barrel should be made slightly larger than the front, so that there may be less liability of the lifting discs fouling on their downward journey. They should have a clearance of from $\frac{3}{16}$in. to $\frac{1}{4}$in. Discs of chilled iron are suitable, hollowed a little, made wide on the edge, and slightly rounded on the top. Excess of water is prevented from running back, and the pumps may be run at a higher speed than usual without splashing. To prevent splashing these pumps are often covered in.

Suction and Delivery Pipes, &c.

Suction pipes should be of ample size, as straight as possible, and perfectly air-tight. Wrought-iron pipes are preferable, and if bends are necessary they should be of as large a radius as possible. In cases of long suctions or heavy lifts, foot or retaining valves should be fitted; in fact, it is better to fit them in all cases, as they keep the pump charged with water. The diameter of delivery pipes should be uniform, whether they are long or short. When pumps are working under heavy pressure it is a good plan to fit an escape valve to the delivery side of the pump, as it relieves the pump from strain in case there should be an obstruction. A check valve should always be fitted in the delivery pipe to relieve the pump from back pressure when starting, or when taken apart for adjustment or repairs. If the pipe is a very long one, its diameter should be increased in proportion to allow for the increased water friction, but bends, angles, &c., increase the friction much more rapidly than length of pipes.

Westminster Hospital has been reopened after being closed to out-patients since last July. Electric light has been put in, cleaning and painting has been done, and another storey is being added to portions of the east and west faces of the building. The alterations will cost about £11,000.

Church Spire Destroyed by Lightning.—During a thunderstorm which broke over Eskdale and Liddesdale last week the lightning struck the spire of the parish church at Rockcliffe, standing 170ft. high, wrecking it down to the belfry. Great stones were thrown tremendous distances, damaging property one hundred and fifty yards off. The church was also greatly damaged.

Rotherham Sewage Works.—The memorial stone of the Rotherham Sewage Outfall Works, estimated to cost £55,000, was laid recently by Lieutenant-Colonel Hirst, the chairman of the Corporation Sewage Committee. The works are at Aldwarke, near Rotherham. The engineer is Mr. R. E. W. Berrington, of Wolverhampton, and the contractors are Messrs. Braithwaite of Leeds. The system adopted includes bacteriological filters and land treatment.

Improvements at Leicester.—A Local Government Board inquiry has been held into the applications of the Leicester Corporation to borrow £33,100 for the construction of a wholesale market, £13,308 for street improvement purposes, £5,640 for sewerage and storm water drainage, and £326 for the purchase of land for a branch fire station. It was explained that the money for street improvement was mostly required in connection with the plan for widening High Street, which is being carried out at a cost of over £100,000 to meet the increased traffic.

New Sanatorium for Burnley.—A new sanatorium, which has been built at Burnley at a cost of £20,000, was opened on Saturday. The institution is for the treatment of infectious diseases, and has been constructed jointly by the Burnley Corporation, the Burnley Rural District Council, Padiham Urban Council, and Brierfield Urban Council. Seven acres of land have been enclosed, and the buildings at present comprise fever pavilion, isolation pavilion, administration block (for doctors, nurses, &c.), laundry, mortuary, and porter's lodge. The whole of the work has been carried out from the designs and under the direction of Mr. F. S. Britton, engineer, Burnley.

Masters and Men.

The Greenock Slaters struck work last week for an advance of $\frac{1}{2}$d. per hour upon their present wage of $8\frac{1}{2}$d. The demand was quickly conceded, and work has been resumed.

Strike at the Simplon Tunnel.—The workmen employed on the Simplon tunnel have decided on a general strike, the employers having refused to recognise their demands.

Building Trade Dispute at Blackpool.—As a result of the notice served six months ago, a number of masons employed in Blackpool are now idle, with a view to resisting the masters' proposed reduction of a farthing. The exact number is now twenty-six, though a large number have had the amount in dispute conceded to them. Seventy-five per cent. are working despite the dispute prevailing. The strike is rather inconvenient for Blackpool, where the building trade is brisk in winter.

Boilermakers' Society.—Messrs. D. C. Cummings (Leeds) and James Conley (Glasgow) were the two candidates for the office of the general secretary to the Boilermakers and Iron and Steel Shipbuilders' Association, vacated by the retirement of Mr. R. Knight. Mr. Cummings, who was elected by a majority of 559, is a Yorkshire district delegate, and is still in the prime of life. His opponent is a district delegate for Scotland. The ballot was as follows:—Cummings, 18,389; Conley, 17,830.

Strike of Scottish Carters.—The carters at Paisley in the employ of the North British Railway contractors for the district, and another firm, to the number of fifty, and about twenty men employed by Messrs. Cowan and Company of the North British Railway, at Coatbridge, have struck work for an advance of 1s. per week. Over seventy men in the employ of Messrs Wordie and Co., and Cowan and Co., at Falkirk, also struck on a demand for an increase of 1s. per week on ordinary days, and an advance of 6d. per horse attended on Sunday. The men put in their demand the previous week, and were informed that the 1s. advance would date from the beginning of last week, and not on the day it was asked. This was how the strike arose, but it has since been settled by their accepting the masters' terms; the Sunday advance was not insisted upon.

Strike at Glasgow.—The employes of the Port-Glasgow Cleansing Department, numbering six carters and nine scavengers, struck work last week. A deputation waited upon a sub-committee of the department and raised the following points:—(1) 6d. per day rise in wages for all workers; (2) ten holidays and pay in each year; (3) double time for Sunday labour, and time-and-half for all overtime; (4) a fifty-one hours' week; (5) that in cases where men's work is changed for a short time wages be unaltered; (6) that arrangements be made so that street and close men can leave their brushes, pails, and shovels in safe places of concealment in their beats while reporting at the depôts and during meal hours; (7) that the present system of fining for trifling offences be abolished; (8) that the extra work imposed on close men of having to sweep the gutters on their beats be abolished; (9) that wheelers receive an increase all round of 2d. per ton. The men have returned to work in consideration of receiving an increase of 1s. per week, on condition that the new Town Council will reconsider their terms.

Trade Unionism and Wages.—A resolution was passed some years ago by the Gloucester Guardians providing that all contractors under the Board should pay the trade union rate of wages. This has now been rescinded. In discussing the matter at a recent meeting, Mr. H. G. Ford admitted that at one time trade unions were necessary to break down monopolies which in some cases existed; but the unions, after doing that, set up monopolies which were more tyrannous than those they had sought to overcome. Moreover, such a resolution prevented men who were getting on in years, and unable to work so quickly as those who were younger, from obtaining employment, because employers could not afford to pay them the standard rate of wage. Mr. Miles argued that it was unfair to tradesmen who paid a fair wage for the Board to give work to those who did not, and maintained that trade unions, by keeping a fair rate of wages, kept men off the rates, and the resolution ought, therefore, to have the hearty support of the Board.

Joiners' Dispute at Cardiff and Barry.—The joiners employed in ship-repairing works at Cardiff and Barry struck last week with the object of obtaining the introduction of a new code of working rules and an increase of wages amounting to 1s. per week. The men's demands have been considered by the Employers' Federation, but are still resisted. The number of men affected is small, and these have probably obtained employment in the building trade, as they are all members of the Carpenters' and Joiners' Society. The dispute has been in progress for some months, although it is only since the end of last week that a crisis has been precipitated. The employers treat the matter with comparative indifference, inasmuch as they have little or no work for the joiners to do. It is estimated that not more than sixty men are affected by the present dispute. Some time ago the employers and men agreed upon alterations in the old code, but subsequently the latter withdrew, and called for the ratification of a new code, and hence the present trouble.

Leeds Building Trade Dispute Settled.—The differences existing between the Leeds Master Builders' Association and the local branch of the London Order of Bricklayers have at last been satisfactorily adjusted. It will be remembered that in May last the men applied for an advance of a penny an hour, which the masters refused to grant. Since then representatives of both sides have met in conference, but without arriving at any agreement, the men declining to accept an offer of $9\frac{1}{2}$d. per hour, being an advance of one halfpenny. Last Thursday, however, a deputation consisting of three members of the order waited upon the committee of the Masters' Association at the Builders' Exchange Club, Duncan Street, and intimated their willingness to take the proffered increase. A deputation of three members of the Manchester Order of Bricklayers, who recently gave notice for a halfpenny advance, were also received, and it was resolved to accede to the request. The increased wages will, therefore, be paid to the members of both orders from May 1st next. Both deputations also consented to abide by the 1896 rules. The meetings were presided over by Mr. W. H. Dews, president of the Builders' Association.

It is proposed to light Cleckheaton by electricity.

An Electric Railway between Manchester and Liverpool is a scheme for which a syndicate, with a capital of £40,000, is now being formed.

The New Public Hall at Pitlochry (Messrs. John Bruce and Sons, of Dundee, architects) has been ventilated by means of Cousland's improved "Climax" patent direct-acting Louvre ventilators and air inlet tubes, supplied by the "Climax" Ventilating and Heating Company, Limited, of 93, Hope Street, Glasgow.

Newport (Mon.) Improvements.—The Bill which is to be introduced into Parliament next session asking for powers to use electricity on the overhead trolley system as traction power on the tramways will involve an expenditure which is estimated at £120,000. The Corporation also intend to go to Parliament for powers to construct a new transport bridge (the invention of a Frenchman, M. Arnodin) over the river. This is estimated to cost £64,000.

Builders' Notes.

Jarrahdale Jarrah.—The "Fredsael" has arrived in London with 850 loads, and the "H. W. Palmer" in Sunderland with 340 loads of this wood, to the order of the agent for the Jarrahdale Jarrah Forests and Railways, Limited, of 1, Fenchurch Avenue, London, E.C.

Renovating Daly's Theatre, London.—In consequence of the re-opening of this theatre, the fan scaffold had to be cleared away, Palmer's travelling cradles being employed to finish the repairs to the stone facings, which were afterwards coated with a preservative fluid.

A Hint to Master Builders.—At the annual conference of the National Association of Master Plumbers of Great Britain and Ireland, held at Leeds last Wednesday, the president (Mr. John Skirrow) said it would be better for all concerned if master builders would fall into line and let each trade manage its own affairs.

Cumberland Green Stone.—Visitors to certain parts of Cumberland are well acquainted with the fact that the county possesses a very excellent red sandstone in the neighbourhood of Aspatria, *inter alia*, and now we are told of a very effective green stone which the Buttermere Slate Co., of Keswick, are working chiefly for decorative purposes, and which is found to be specially suitable for use in conjunction with the sandstone. It is employed for mullions, quoins, heads, sills, fenders, &c. The colour has the advantage of gaining greatly in appearance when wet, a feature which, in the Cumberland climate, is significant.

London County Council.—At their meeting held on November 7th it was decided to introduce a Bill in the coming Parliamentary session to purchase the undertaking of the eight London water companies; an amendment to the Bill for the supply of water from Wales, to be introduced next session, was rejected. It was resolved to seek powers to acquire the garden of Albert Square, Commercial Road, E., for the purpose of public recreation, and to obtain powers to enable the vestry of Hampstead to contribute £1,000 towards the cost of the acquisition of the Dollis Hill estate. Some discussion took place on the proposal of the Parliamentary Committee to obtain power to enable the vestry of Battersea to erect dwellings for the working classes on a portion of the Latchmere allotments, and to lay out the remainder as a public open space to be maintained by the vestry; but the recommendation was adopted.

Relief Painting on Wood.—Decorator Painter Wilhelm Plinwald, of Stuttgart, has taken out a patent for an invention which admits of producing ornaments in relief on wood or stone as quickly as they can otherwise be drawn or painted. When the priming only is done a wood-colour or a coloured glaze needs to be applied. The new process, says the "Scientific American," is carried out as follows: Add to suitably-diluted size enough chalk so that the mixture can be dabbed upon the surface to be decorated. The lower ground may consist of any material, as wood, stone, or gypsum. After six or eight applications and rubbing down or smoothing a layer of about five millimetres in thickness is obtained. The rubbing down is best performed wet, with pumice-stone, whereby all air-pores are closed up, and a nice smoothness results. Upon the surface thus created an ornament is applied by hand or with a stencil in moderately thick lines, and with not too fat a paint, in order to prevent it from running off. After the drying of the paint, all the uncovered places of the surface are treated with sponge or brush and softened water, to which a little potassium bichromate is added. The result will be that the ornament put on with fat paint will remain raised, while everything else is washed away more or less deeply through the treatment. Hence a flat-relief ornament is created, which, treated with colours after drying, presents a much more favourable effect than the imitations attempted by shading. The bichromate of potassium added to the water penetrates very deeply into the mass, eventually taking away its perviousness to water.

The London County Council's Mistake.—In the Metropolitan Tribunal of Appeal sitting at the Surveyors' Institution on Friday, a sum of £50 was awarded to an appellant against a decision of the London County Council. It appeared that Messrs. Curnick and Co. applied to the London County Council for sanction to certain plans for the rebuilding of Nos. 60 and 62, Regent Street, and Nos. 7 and 9, Glasshouse Street, St. James'. The Council refused to sanction the plans, but later (according to the counsel for the County Council) it was found that the application did not require the sanction of the Council, and that the refusal of that body was of no importance. The applicants not knowing this were put to the trouble of appealing, and at the sitting of the tribunal on Friday the Council withdrew from the position they had taken up. It was shown that the Act of 1894 did not apply to the case under notice, and that that being so the refusal of the Council had no force. In the end the County Council agreed to pay the appellants the sum of £50 in consideration of the inconvenience caused, together with costs.

A Claim for Injury.—In the case of Pavis v. Wills recently heard in the Queen's Bench Division of the High Court of Justice the defendant was a builder who was building houses at Winstead Road, Battersea, S.W. He employed various sub-contractors to do different branches of the work—*e.g.*, for bricklaying, slating, building manholes, plumbing, &c. The sub-contractor for bricklaying was named Manhire. Manhire constructed the scaffolding with the defendant's materials, and the Court found that at the time it was constructed the scaffolding was sufficient. Manhire having completed the brickwork, the scaffold remained up for the use of the other sub-contractors, until Manhire could do the pointing. During that interval the plaintiff, who was employed by Jackson, a sub-contractor employed by the defendant for building manholes, was passing under the scaffold on his way to his work, when a slate fell through the scaffold and injured his thumb, disabling him for four months. It appeared that when the scaffold was put up it consisted of five planks and a guard board. Some one removed three planks and the guard board. There was a heap of slates upon the scaffold, and it was one of these slates which fell upon the plaintiff. At that time Manhire was not engaged on the job. The plaintiff brought the action against the defendant to recover damages for the injuries he had so received. The County Court Judge (after two trials) gave judgment for the plaintiff. The defendant appealed.—The Court held that the appellant was liable. He was not only the person who had contracted with the bricklayer for the construction of the scaffold, but he was also permitting it to be used by the other contractors so far as they had to use it in their work, and permitting it to remain on the premises upon which they were carrying out work in which he was interested. In this sense he was possessed of it, and if he did not actually provide it in the first instance, there was evidence from which it might be properly inferred that he adopted it as provided for him and allowed it to be used by them and to be there while they were working. Under these circumstances the rule stated in "Heaven v. Pender" applied, and the appellant therefore was liable. The appeal was dismissed.

"Rushing" up a Building.—An action was recently brought in the Queen's Bench Division of the High Court of Justice by Messrs. J. Chessum and Sons against Mr. Herbert Huntley Gordon to recover £5,934 8s. 3d., alleged to be due in respect of buildings erected by the plaintiffs for the defendant under certain agreements, and for damages for the breach of these agreements. The defendant denied that he made the first agreement, and counterclaimed for damages for alleged breaches of the second. In December, 1897, the plaintiffs, who are builders and contractors, entered into a contract with the defendant to erect for the latter, for the sum of £7,500, a large block of buildings called Stafford House, between Bread Street and Cannon Street, London. The defendant, who had recently bought the site of the buildings, was his own architect. The contract provided that the ground floor of the buildings should be completed by March 25th, 1898, and that the whole should be completed by June 24th, and penalties were provided in case of delay. There was a good deal of friction in the course of the building, chiefly on the subject of extras, but the building proceeded. The defendant desired to carry his building higher than the buildings which formerly stood upon the site, and he believed that if he could succeed in carrying the buildings up beyond the old height before an injunction were obtained against him for infringement of ancient lights by the owners of the property on the opposite side of Bread Street, the Judge would be reluctant to compel him to take them down, and would only order him to pay compensation. He went abroad on March 27th for a holiday, but prior to this he had instructed the plaintiffs' foreman, as soon as the old height was reached, to rush up the work. He also left instructions with his solicitor, Mr. Danvers, to deal with difficulties as they arose. On April 7th Mr. Danvers, purporting to act on the defendant's behalf, entered into a new agreement with the plaintiffs, by which it was stipulated that they should rush up the wall opposite Bread Street, in consideration of which it was agreed that no action should be taken in respect of the plaintiffs' failure to complete the buildings by the time stipulated, and that the plaintiffs' claims as to extras should be admitted. The wall was accordingly rushed up. An injunction was, however, afterwards obtained against the defendant, who was compelled to pull down the wall so far as it exceeded the former limits. The defendant repudiated the agreement of April 7th, 1898, when it came to his knowledge, and in May he evicted the plaintiffs from the works on the ground that they had not complied with the contract of December, 1897. The plaintiffs now claimed the amount alleged to be due in respect of the work done by them, together with damages for the injury to their reputation by reason of the eviction. The defendant's case was that when he went abroad he had no reason to suppose that the critical time when the buildings would have reached the height of the old buildings would arrive before his return, and that no authority was given by him to Mr. Danvers to deal with the matter of rushing up the buildings; but that his authority to that gentleman was limited to dealing with the disputes which had arisen as to extras. The defendant's counter-claim was for the loss he had sustained by reason of the injunction. Three issues were ordered to be tried—(1) whether the supplemental agreement of April 7th, 1898, was valid and binding on the defendant; (2) whether the eviction of the plaintiffs was wrongful; (3) the amount of damage done to the plaintiffs' reputation by the eviction. The first of these issues was the only one now tried. The jury, having been asked whether Mr. Danvers had authority to make the agreement of April 7th, 1898, replied in the affirmative. It having been conceded that in this event the eviction was wrongful, the issue relating to that matter was dropped, and the remaining issue was referred to Mr. Herbert Steward, the arbitrator agreed on by the parties, who was instructed to find the total amount due to the plaintiffs.

Tunbridge Wells proposes to largely extend its electric lighting system.

Engineering Notes.

An Underground Electric Railway for Manchester is proposed.

Improvements at Warrington. — The Corporation propose to spend £44,966 on electric lighting, and £9336 for the provision of a central sanitary depot at Parr Street.

Survey for the Nicaragua Canal.—Admiral Walker and fifteen engineers have sailed for Bluefields to make a new survey of the proposed route for the Nicaragua Canal.

Mr. W. E. Mather, elder son of Mr. William Mather, and a director of the well-known engineering firm of Mather and Platt, has died as the result of being thrown from his horse.

A Lighting and Traction Scheme at Llanelly is estimated to cost between £80,000 and £100,000. The Council will enter into an agreement with the British Insulated Wire Company, Limited.

The National Telephone Co.'s New Premises have been fitted with an entirely new installation for the complete warming and ventilation by Messrs. John King, Ltd., of Liverpool. "Rajah" ventilating radiators are used.

The New Fever Hospital, Cape Town, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves, descending smoke flues, patent Manchester grates, and under bed ventilators, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Most Ancient Machine Tool.—There can be very little doubt (says a writer in "Cassier's Magazine") that the potter's wheel represents to-day the most ancient form of machine tool known. Among the many sculptured records of the trades and occupations which so vividly represent the customs and habits of the ancient Egyptians, the potter and his wheel have been found frequently depicted, and it is curious to note that through the almost countless generations since that time this crude type of lathe has undergone no material modification. It is curious, too, that in none of these ancient records are there shown examples of the forerunner of the common turning-lathe as we know it to-day, even though the art of turning may be traced back to a very remote period. Among Egyptian antiquities that have been found at Thebes and other cities there have been many specimens which exhibited indubitable signs that the material, while in revolution, was subjected to the action of a tool held at rest—legs of stools and chairs, for example, and lamps and musical instruments—and in later centuries, among the Greeks and Romans, the lathe was undoubtedly in common use. Cicero and Pliny both refer to the art of turning, and Herodotus thus uses the lathe as a familiar simile: "But I smile when I see many persons describing the circumference of the earth, who have no sound reason to guide them; they describe the ocean flowing round the earth, which is made circular as if by a lathe." Unfortunately, however, it appears that none of these nor other early writers have left any account of the lathes and tools employed by their contemporaries.

Surveying and Sanitary Notes.

A Motor Dust Van is to be given a two weeks' trial by the Strand Board of Works. It was estimated that a motor cart weighing three tons would save £232 a year in the cost of dust collection and street watering.

Whitby Improvements.—It is intended to erect a public lavatory at the foot of Kyber Pass at a cost of about £1,181, and to spend £212 on improving the sewerage of the village of Ruswarp. It is also intended at an early date to erect a public shelter in connection with the lavatory.

Sanitary Inspectors.—The next examination for sanitary inspectors under the Public Health (London) Act, 1891, will be held at the Examination Hall, Victoria Embankment. The preliminary examination will take place on Tuesday, December 5th, and the technical examination on Thursday, Friday, and Saturday, 7th, 8th, and 9th December, commencing on each day at 10 o'clock a.m.

The Main Drainage of London.—Serious complaints have been made for some time past of the insufficiency of the main sewers in various parts of London, and the attention of the London County Council has frequently been directed to the dangers arising to public health from the periodical flooding of dwelling-houses and other buildings with storm water and sewage. At its first meeting in December the London County Council will consider an important report from its Main Drainage Committee. Strong representations on the subject have been received from twenty-three local authorities. The success which has followed the Council's operations in the past in improving portions of the sewerage system at a capital cost of £1,143,402 during the ten years ending March 31st last, is a fact on which, the Committee think, the Council may well congratulate itself. The main drainage system was constructed by Sir Joseph Bazalgette to serve 3,450,000 persons, with an average water supply of 31¼ gallons per head, whereas it now serves 4,700,000, or 36 per cent. more persons, with a water supply of from 35 to 40 gallons per head. The population is increasing at the rate of about 400,000 persons in every ten years, and will, in all probability (the Committee say), amount to a total of 7,000,000 within the County of London when it is fully built over. The dry-weather flow of sewage for which the system was designed was 108 million gallons daily, whereas the quantity now passing may be taken at about 195 million gallons daily, or an increase of about 80 per cent. The northern low-level sewer was not designed to take any of the sewage west of Chelsea, as it was intended to discharge it after treatment into the Thames somewhere near Imperial Road, Fulham; and, as regards the area south of the Thames, the whole of the drainage amounts in dry weather to about 80 million gallons daily, and all this quantity has to pass through the only existing sewer between Deptford and Crossness. The Committee have come to the conclusion that works "must ultimately be carried out" that will involve an expenditure of about three millions sterling. For the present, however, they merely recommend the construction of two additional outfall sewers, each 9ft. in diameter, between the Abbey Mills pumping station and the Barking outfall, and the construction of an additional outfall sewer, of 11ft. 6in. diameter, between the Deptford pumping station and the Crossness outfall works. These sewers, which involve an outlay of £1,250,000, will take about eight years to complete.

Trade and Craft.

ELECTRIC LIGHTING.

We have received from Mr. G. Braulik, of 217 and 218, Upper Thames Street, London, E.C., the sixth and latest edition of his catalogue of electric light supplies, section "L." This includes switches of all kinds, distributing boards, testing instruments, meters, cut-outs, roses, plugs, casings, accumulators, &c., and is, in fact, comprehensive. In consequence of the great increase in his business, Mr. Braulik has enlarged his premises and stock, so that large orders can now be executed with every dispatch, a very appreciable merit. Some of the large switchboards illustrated in the catalogue are very well designed, and have a good appearance. There are also shown quick-break knife switches, main switches with laminated contacts (these are of best English workmanship, and the finish is guaranteed), multiple contact resistance switches, accumulator switches of various kinds, and innumerable varieties of tumbler switches (including a patent suspension tumbler switch). On page 39 some fancy switch covers of very pleasing design are shown. The new combined bolt, indicator, and switch, for water-closets, should be found very useful, as the simple turning of the handle bolts the door, indicates that the apartment is engaged, and switches on the light. Mr. Braulik's new Serpent bayonet lamp-holders are suitable for ordinary or high tension, and are easily fitted. They are made in polished brass or bronze. Voltmeters and ammeters form another prominent feature in the catalogue, and all varieties and sizes are illustrated. The patent dynamo brushes shown on page 106 are made of finely crimped copper wire, compressed into a special gauze covering, and do not spread on the commutator. The latter part of the catalogue is devoted to heating apparatus, and includes such things as electrically-heated soldering irons, glue pots, kettles, cooking and domestic appliances, and radiators. With regard to the last, there is illustrated an ornamental screen radiator of highly ornamental design that can be moved about as desired. It looks exceedingly well, but is only made to order. Section I. of the electric light catalogue, dealing with all kinds of lamps, has also been sent to us. Both catalogues are well printed, and should be handy for reference. In addition to his London premises, Mr. Braulik has a Manchester branch at 22, Blackfriars Street.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—		
Nov. 18	Beckermet, Cumberland—Villa Residence	....	J. S. Moffat, Architect, Whitehaven.
,, 18	Broughton Moor, Cumberland—Public Hall, &c.	Flimby Colliery Company	Donald and Tate, 14, John-street, Workington.
,, 18	Dublin—Alterations to General Post Office	Office of Public Works	H. Williams, Secretary, Dublin.
,, 18	Gorey, Ireland—Residence	Union Guardians	R. Creighton, Clerk, Workhouse, Gorey.
,, 18	Knaresborough—Two Semi-Detached Houses	L. Ancelle	J. G. Brown, Architect, Knaresborough.
,, 18	Sowerby Bridge, Yorks.—Four Scullery Houses	....	C. F. L. Horsfall & Son, Lord-street-chambers, Halifax.
,, 18	Brymbo, Wales—Twelve Cottages	....	E. Jones, Beehive, Brymbo.
,, 20	Southampton—Workhouse Infirmary	Guardians	W.H.Mitchell,Son&Gutteridge,9,Portland-st.,Southampton.
,, 20	Clones, Ireland—Engine Running Shed	Great Northern Rly. Co. (Ireland)	Engineer-in-Chief, Amiens-street Terminus, Dublin.
,, 20	Disley—Culvert	Rural District Council	G. M. Collins, Surveyor, Croft House, Whaley Bridge.
,, 21	Accrington—Stables, &c.	Lancs. and Yorks. Railway Co.	Engineer, Hunt's Bank, Manchester.
,, 21	Brighouse—Stables, &c.	Lancs. and Yorks. Railway Co.	Engineer, Hunt's Bank, Manchester.
,, 21	Salford—Foundations and Shed	....	Borough Engineer, Town Hall, Salford.
,, 21	Sedbergh, near Kendal—Additions to National Schools	School Managers	J. Hutton, Architect, Kendal.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Nov. 21	Wolverhampton—Pulling-down, &c.	Public Works Committee	J. W. Bradley, Surveyor, Town Hall, Wolverhampton.
,, 22	Leeds—Parsonage	Vicar of St. Aidan's Church	Bedford & Kitson, Architects, Greek-street-chmbrs, Leeds.
,, 22	Sunderland—Fever Pavilion	Corporation	Borough Engineer, Town Hall, Sunderland.
,, 22	London, N.E.—Portland Cement	Hackney Vestry	N. Scorgie, Chief Surveyor, Town Hall, Hackney, N.E.
,, 22	Cricklade, Wilts.—Police Station	Standing Joint Committee	C. S. Adye, County Surveyor, County Offices, Trowbridge.
,, 23	Burton-upon-Trent—Fire Bricks, Retorts, &c.	Town Council	F. L. Ramsden, Manager, Gas Works, Burton-upon-Trent.
,, 24	Skipton—Isolation Hospital	Rural District Council	G. E. Bolshaw, 189, Lord-street, Southport.
,, 27	East Ham—Caretaker's Residence	School Board	R. L. Curtis, 120, London Wall, E.C.
,, 27	Londonderry—Enclosure Walls, &c.	Corporation	City Surveyor, Guildhall, Londonderry.
,, 29	Kidderminster—Abutments, &c., to Two Bridges	Town Council	A. Comber, Borough Engineer, Town Hall, Kidderminster.
,, 29	Gateshead—Additions to Higher Grade School	School Board	Oliver, Leeson & Wood, Architects, Mosley-st., Newcastle.
,, 29	Yardley—Boundary Wall and Entrance Gates	Burial Board	W. H. Lloyd, 38, Bennett's-hill, Birmingham.
,, 30	Lossiemouth, Scotland—Church Works	....	J. H. Glennie, Sec. New Established Church, Lossiemouth.
Dec. 2	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
,, 5	Cowes, I. of W.—Police Station	I. of W. County Council	F. Newman, County Surveyor, St. Thomas-street, Ryde.
,, 5	Bexley—Infants' School	School Board	J. Ladds, 7, Doughty-street, Mecklenburgh-square, W.C.
,, 11	Liverpool—Cottage Home School, &c.	Vestry	E. Kirby, 5, Cook-street, Liverpool.
,, 20	Farnborough, Bolton—Nurse's Home at Workhouse	Union Guardians	Bradshaw and Gass, 19, Silverwell street, Bolton.
Jan. 6	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Swindon, Wilts.
	ENGINEERING—		
Nov. 17	Portsmouth—Electric Tramcars	Corporation	E. Rotter, Tramways Engineer, Portsmouth.
,, 17	Gorton, Lancs.—Detritus Catchpits, &c.	Urban District Council	C. J. Lomax, 37, Cross-street, Manchester.
,, 17	Leeds—Water Mains	Corporation	T. Hewson, City Engineer, Municipal Buildings, Leeds.
,, 17	Runcorn—Waterworks	Rural District Council	G. F. Ashton, 71, High-street, Runcorn.
,, 18	Ashby Woulds, Leics.—Water Main	Urban District Council	G. H. Lilley, Town Hall, Ashby-de-la-Zouch.
,, 18	Perth—Iron and Steel Roofing	Gas Commissioners	A. Gillespie, 34, St. Enoch-square, Glasgow.
,, 18	Chorley, Lancs.—Telephone Installation, &c.	Joint Hospital Board	Jolly and Buckley, Architects, High-street, Chorley.
,, 18	Loughborough, Leics.—Pumping Main, &c.	Corporation	G. and F. W. Hodson, Engineers, Loughborough.
,, 20	Edinburgh—Contractors' Plant	Edinburgh and Leith Gas Commissioners	J. M'G. Jack, 25, Waterloo-place, Edinburgh.
,, 20	Swansea—Boilers	Corporation	J. Thomas, Town Clerk, Guildhall, Swansea.
,, 20	Blackpool—Tramways	Tramways Committee	J. Wolstenholme, Borough Engineer. Town Hall, Blackpool.
,, 21	Chipping Campden—Putting-down Bore Tube	Rural District Council	N. Lailey, 16, Great George-street, Westminster.
,, 20	Hull—Waterworks	Sculcoates Rural District Council	W. H. Wellsted, Engineer, Prince's Dock-chambers, Hull.
,, 22	Middlesbrough—Condensing Plant and Pipework	Electric Lighting Committee	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 22	Bury St. Edmunds—Electric Wiring, &c.	Town Council	J. C. Smith, Boro' Surveyor, Town Hall, Bury St. Edmunds.
,, 22	London, N.—Condensing Plant	St. Mary's Vestry, Islington	Electrical Engineer, 50, Eden grove, Holloway, N.
,, 24	Celbridge, Ireland—Pump Well	Rural District Council No. 2	F. Shortt, Clerk, Workhouse, Celbridge.
,, 25	Bakewell—Sewerage Works	Rural District Council	Sterling and Swann, Town Hall, Chapel-en-le-Frith.
,, 25	Glasgow—Landing-stages, &c., for Steamboats	Corporation	J. M. Gale, 45, John-street, Glasgow.
,, 25	Burnham-on-Crouch—Sinking Well	Urban District Council	L. Dilliway, Clerk to Council, Burnham-on-Crouch.
,, 27	Felsted, Essex—Electrical Plant	School Governors	O'Gorman & Cozens-Hardy, 66, Victoria-st., Westminster.
,, 29	Kidderminster—Two Steel Girder Bridges	Town Council	A. Comber, Borough Engineer, Town Hall, Kidderminster.
,, 29	Blackpool—Widening Promenade, &c.	Corporation	J. Wolstenholme, Borough Engineer, Town Hall, Blackpool.
,, 30	Edinburgh—Talla Reservoir	Water Trustees	J. Wilson, 72A, George-street, Edinburgh.
,, 30	Newcastle-upon-Tyne—Generators	Corporation	C. Hopkinson, 29, Princess-street, Manchester.
,, 30	Dornoch, Scotland—Light Railway	Highland Railway Company	W. Roberts, Company's Engineer-in-Chief, Inverness.
,, 30	Port Elizabeth—Railway	....	General Manager of Railways, Capetown.
Dec. 5	South Mimms, Middlesex—Reconstruction of Bridge Culvert	County Council	H. T. Wakelam, County Engineer, Guildhall, Westminster, S.W.
,, 6	Manchester—Supply of Gasmeters	Gas Committee	C. Nickson, Superintendent, Town Hall, Manchester.
,, 12	London, N.E.—Refuse Destructors	Hackney Vestry	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 30	Panama—Aqueduct	Authorities	Commercial Department, Foreign Office, Whitehall, S.W.
,, 31	Porto Alegre—Electric	Municipality	Commercial Department, Foreign Office, Whitehall, S.W.
,, 31	Mistretta—Electric Lighting Town	Municipality	Commercial Department, Foreign Office, S.W.
Jan. 1	Rangoon—Air Compressing Machinery	Municipality	O. Gillanders and Co., Sun-court, 67, Cornhill, E.C.
,, 2	Llanelly—Reservoir	Urban District Council	J. H. Barnes, 30, Gt. George-street, Westminster, S.W.
,, 3	Concepcion—Drainage and Waterworks	Chilian Government	Commercial Department, Foreign Office, Whitehall, S.W.
,, 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
	IRON AND STEEL—		
Nov. 17	London, E.C.—Railway Stores	Assam-Bengal Railway Co., Ltd.	F. A. Lyall, Sec., Bishopsgate House, 55 and 56, Bishopsgate-street Within, E.C.
,, 18	Much Wenlock, Salop—Cast-iron Pipes	Sanitary Committee	— Wyatt, Engineer, Bryndwr, All Saints, Shrewsbury.
,, 20	Bristol—Stores	Sanitary Authorities	T. H. Yabbicom, 63, Queen-square, Bristol.
,, 20	London, N.—Cast-iron Lamp Columns	Hornsey Urban District Council	E. J. Lovegrove, 99, Southwood-lane, Highgate, N.
,, 20	Glasgow—Cast-iron Pipes	Corporation Electricity Department	Sir J. Marwick, Town Clerk, City-chambers, Glasgow.
,, 21	London, N.—Stores	London General Omnibus Co., Ltd.	R. T. Kingham, 235, Upper-street, Islington.
,, 21	Salford—Tie-Bars and Bolts for Tramways	....	Borough Engineer, Town Hall, Salford.
,, 25	Dublin—Railway Stores	Gt. Northern Rly. Co. (Ireland)	General Stores Depot, Dundalk.
,, 27	Dublin—Railway Stores	Gt. Southern & Western Rly. (Ireland)	Storekeeper, General Stores, Inchicore, Dublin.
,, 25	Glasgow—Steel Rails	Corporation	J. Young, 88, Renfield-street, Glasgow.
	ROADS AND CARTAGE—		
Nov. 17	Preston, Lancs.—Paving, &c.	Corporation	Borough Engineer, Town Hall, Preston.
,, 18	Rugby—Improvement Works	Urban District Council	D. G. Macdonald, Surveyor, Rugby.
,, 18	Bognor, Sussex.—Laying Cricket Field	....	W. Tickle, 80, High-street, Bognor.
,, 20	Croydon—Repair to Private Roads	Corporation	Borough Road Surveyor, Town Hall, Croydon.
,, 21	Woodbridge—Steam Road Rolling	Rural District Council	J. R. Davison, Surveyor, Council Offices, Woodbridge.
,, 21	Woodbridge—Materials	Rural District Council	J. R. Davison, Surveyor, Council Offices, Woodbridge.
,, 21	Newcastle-upon-Tyne—Materials	Town Improvements Committee	City Engineer, Town Hall, Newcastle-upon-Tyne.
,, 21	London, S.W.—Three Motor Vans	Chelsea Vestry	T. W. E. Higgins, Surveyor, Town Hall, Chelsea.
,, 22	Blackpool—Works and materials	Corporation	J. Wolstenholme, Borough Engineer, Town Hall, Blackpool.
,, 23	Fulham, S.W.—Road-making, Tar Paving, &c.	Metropolitan Asylums Board	T. D. Mann, Norfolk House, Norfolk-street, Strand, W.C.
,, 23	Eccles, Lancs.—Granite Setts, Paving, &c.	Highways Committee	A. C. Turley, Borough Surveyor, Town Hall, Eccles.
,, 28	West Hartlepool—Materials	Corporation	J. W. Brown, Borough Engineer, Hartlepool.
	SANITARY—		
Nov. 18	Chorley, Lancs.—Disinfecting Liquid	Corporation	J. Mills, Town Clerk, Town Hall, Chorley.
,, 18	Rugby—Sewers	Urban District Council	D. G. Macdonald, Engineer to Council, Rugby.
,, 20	Greetland, Yorks.—Sewer, &c.	Urban District Council	R. Horsfall and Son, Engineers, Commercial-street, Halifax.
,, 20	Croydon—Pipes, Sewers, &c.	Corporation	Borough Engineer, Town Hall, Croydon.
,, 25	Audenshaw, Lancs.—Removal of Night Soil, &c.	Urban District Council	T. Chorlton, Clerk, 2, Guide-lane, Audenshaw.
Dec. 2	Newcastle-upon-Tyne—Collection of Refuse	Sanitary Committee	City Engineer, Town Hall, Newcastle-upon-Tyne.
,, 6	Morecambe—Sewerage Works	Urban District Council	Beesley, Son & Nichols, 11, Victoria-st., Westminster, S.W.
,, 9	Cheltenham—Sewerage Works	Corporation	Borough Surveyor, Municipal Offices, Cheltenham.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Nov. 25	Rye, Sussex—Sewerage Scheme	£25, £10	T. J. Smith, Clerk to Rural D. Council, Flushing House, Rye.
,, 30	St. Agnes, Cornwall—Water Scheme	£25	J. Argwin, Clerk to Parochial Committee, St. Agnes.
,, 30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *viâ* New York.
Dec. 1	Bury, Lancs.—Infectious Diseases Hospital	£100, £50, £25	Borough Engineer, Corporation Offices, Bury.
,, 1	Roanoke, Va., U.S.A.—Brick and Stone R.C. Church	....	J. J. Garry, Roanoke, Va., United States.
,, 15	Lymm—Council Chamber and Offices	£25, £15	W. Mullard, Clerk to Urban District Council, Lymm.
Jan. 31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.
Mar. 12	Belfast—Assembly Hall	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast.

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Plot of land, frontage 80ft. to Lloyd's-avenue, area 8,160ft.

Plot of land, frontage 60ft. to Lloyd's-avenue, area 13,240.

Plot of land, frontage 60ft. to Lloyd's-avenue, area 9,270ft.

Plot of land, frontage 57ft. to Lloyd's avenue, area 5,350ft.

Plot of land, frontage 21ft. to Crutched-friars, and 69ft. to Lloyd's-avenue, area 1,350ft.

Plot of land, frontage 49ft. to Lloyd's-avenue, 54ft. to Crutched-friars, 42ft. to Northumberland-alley, area 2,450ft.

Plot of land, frontage 54ft. to Lloyd's-avenue, and 54ft. to Northumberland-alley, area 3,120ft.

Plot of land, frontage 69ft. to Lloyd's-avenue, and 74ft. to Northumberland-alley, area 4,220ft. super.

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To Land Companies, Builders, Speculators, and others.

Finchley, N.—By order of the Trustees of the late Julian Stephens, Esq. — Valuable FREEHOLD BUILDING ESTATE, known as Grove House, Regent's Park-road, Finchley, N. (locally known as Ballards-lane), three minutes' walk from Finchley (Church End) Station, on the branch line of the Great Northern Railway, whence there is an excellent service of trains to Broad-street, Moorgate-street, and King's Cross, and only thirty minutes' drive of Regent's Park. The estate consists of a detached residence, standing in charming grounds, with stabling, paddock, orchard, and meadow, in all about 9¾ acres, and occupies one of the most important and commanding positions in this well-known healthy suburb, stands 360ft. above sea-level, is absolutely ripe for immediate development, and possesses very valuable frontages to the main Regent's Park-road and Nether-street, Finchley. Vendors' Solicitor, A. W. Mills, Esq., 4, Chancery-lane, W.C.

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Cabinet Maker's Guide (Bitmead)	3s. 6d.
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NOVEMBER 22, 1899.
No. CCL.

EFFINGHAM HOUSE,
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An Architectural Causerie.

Petersham Woods. THE tiny rural village of Petersham, ten miles distant from London, remains to this day as secluded as any village in Surrey, although on the borders of the now populous town of Richmond. The parish extends over the great area comprised between Richmond on the east, and Ham on the west, and stretches from the Thames on the north over the whole of Richmond Park to the south. Notwithstanding this territorial size, it still contains a population of only some six hundred and twenty persons. Eight years ago, or thereabouts, the inhabitants of Petersham were so ill-advised as to agree to being incorporated with the new municipal Borough of Richmond; but to-day those ardent persons who voted for incorporation only too bitterly deplore their enthusiasm, and wish their work undone, for Richmond has ever proved an aggressor and an encroacher upon the rights and rural beauties of this sole remaining one of the rustic villages that once surrounded London. The latest scheme is for the "appropriation and regulation" of Petersham Common. Called usually "Petersham Woods," this hillside tract of densely-wooded common land is well known to cyclists, for it borders the lower road from Richmond to Petersham village, and extends from the level meads to the crest of the Hill and the "Star and Garter." Ancient oaks and elms, many of them romantically shrouded with venerable ivy, make up this woodland, and thick tangles of natural and undisturbed undergrowth render it unique, now that "improvements" have improved away other wild woods of the Home Counties. Richmond Park itself contains nothing to rival the rich luxuriance of these tangled thickets, where wild birds nest and the nightingale sings throughout the summer nights. It is the ambition of the Richmond Corporation to clear away these coverts, and to cut down trees to form paths: in short to spoil this hitherto unspoiled spot and to make it as much like a park as possible. If it were readily to be done, they would level the Hill, too, for your true grocer or butterman, elevated to the representation of some ward on a town council, hates natural inequalities of surface. Unhappily, unless these corporate Perkin Middlewicks can be educated, the wildness of Petersham Woods is doomed, for the Board of Agriculture has given the Richmond Corporation the control of the Common. Petersham, which is represented on the Council, and the Earl of Dysart, as Lord of the Manor, have the power of appointing conservators, but Richmond has been given the greater representation, and those who hold a brief for the preservation of Petersham Woods in their natural beauty can always be easily outvoted. C. G. H.

PETERSHAM WOODS. DRAWN BY C. G. HARPER.

The Wayfarer's Discovery. FOR a reason best known to himself the Wayfarer decided last week that the saying "Except a man work, neither shall he eat" applied even to him, and that, if something was not done shortly, he would be in a tight corner. With a reluctance born of a disinclination to work except under great provocation, he eventually decided that in tracing it was possible to cover the largest amount of ground with the smallest expenditure of brain tissue. Arriving at this sensible conclusion, he cast about for a means of getting that kind of employment on the most lucrative terms. After sampling a number of architects without success, he came across a place in one of the quiet inns of the West End where his reception was more encouraging. In answer to his timid knock at a door on the third floor landing, the Wayfarer was brought face to face with a young man of a cheerful and enquiring countenance: alert, and quite sure of himself, his gaze, frankly critical, swept over the visitor. Who is this person it seemed to say. "Do you want a neat tracer?" asked the Wayfarer hurriedly, and then blushed as if he felt it was really going too far in suggesting that he was neat. "Just take a seat and wait a minute," answered the young architect, and vanished into a room on the right. The door opened again in a moment or two, and the cheerful person reappeared, saying, "Come in; we will see what we can do for you." Once inside, hope began to find a place in the Wayfarer's heart. A number of drawings lying about in a state of confusion promised much, and to the question put by the other partner (for there were two of them), "Can you trace for sunprinting?" he answered boldly, "Yes, sir," although quite in the dark as to what sunprinting might be. "Well, then, just make a good tracing of the west end of the building, and keep your lines fairly thick. See! you might take this as a copy," pointing to a well-inked-in ½in. detail. Having obtained work the Wayfarer settled down to a leisurely cleaning of his drawing instruments. This being done, he took stock of his employers and surroundings. A pleasant office, thought he, but rather queerly furnished. Why is the picture rail close to the skirting, and why do the principals talk in such a bantering strain of a new art movement? What is this new art movement, said the Wayfarer to himself, beginning to trace the detail? Perhaps I am on the verge of a discovery. Who knows? And as he listened more attentively to the conversation the ink ran out of his pen, making a huge blot on the tracing linen, which was not exactly a good start for a neat tracer, but it was soon licked out of existence with an ease that could only be the outcome of a wide experience. Looking at the tracing again—and this time more attentively—he discovered that the design was of a kind quite unfamiliar to him. It was so plain, it might even be called ugly, but at least it had the merit of being interesting, fresh, and unusual. This must be the new art movement, thought the Wayfarer, stopping his tracing, so overcome was he with the joy of having found some new "ism," some new thing upon which to centre his emotions. Recovering himself he traced savagely until tea-time, making up his mind to devote several hours during the next week to formulating a scheme for the running of new art movements all over the country, but he first must learn more of the true inwardness of the New Art.

G. LL. M.

Civil Service Appointments. AT a time of the year when architects are reducing the number of their assistants, owing to a natural falling off in the amount of work to be done, it is only natural to find an increase in the number of the unemployed, of whom some are asking themselves whether more permanent employment cannot be obtained. Of these a certain proportion annually elect to commence practice on their own account. Others are debarred from doing so, and from thus realising the true object of their many years of training; they lack either the means or the influence or the temperament necessary for the successful conduct of independent business. To these, and they are many, the permanent appointments of a technical nature in the various branches of the Civil Service have a considerable attraction. The same energy of character as is requisite for the rough and tumble life of a practising man is hardly necessary, while a solidly satisfactory draughtsman, designer, quantity surveyor, or civil engineer is at a premium. True, entrance to the permanent staff is only to be obtained by success in a severely competitive examination against other highly-trained and competent technical men, none being admitted save such as have served in the office of an architect or civil engineer for a period of several years; but as the age limits are wide—generally twenty-one to thirty—there is fair hope of success being achieved by a worker, if he commences early enough, at his second or third if not at his first attempt.

The three principal departments in which such appointments are obtainable are the Admiralty (assistant civil engineers and assistant surveyors), the War Office (assistant surveyors), and the Office of Works (assistant surveyors and assistant examiners), but there are many other departments having a small technical staff recruited by occasional examinations as vacancies occur. In almost all instances, whatever may be the official title of the appointment, architects' assistants are eligible to compete, and will not infrequently stand as good a chance as will civil engineers. With regard to pay, the initial salary is equal to and generally much better than that obtainable in a private office, with the advantage of steady increase throughout service and a pension on retirement at the age of sixty-five, with sufficient but rarely excessive work or responsibility, and absolute security against dismissal save for flagrant misconduct. On the other hand, the successful candidate must be content to sink his individuality entirely, to become a mere unit in a vast machine, and, in one department at least, to suffer social ostracism. This last is a very serious disadvantage, often only half realised by young men when first they enter, but brought bitterly home to them in after years, especially if they be gentlemen by birth, as most of them are, and married to ladies of their own position, and the department in question has been for many years steadily sinking in the estimation of candidates, with the likelihood of its sinking still further unless some drastic reforms be made. In the other departments the life is at least tolerable, in some distinctly so, and men of sufficient ability, who at the same time are unlikely to succeed in practice, are justified in striving to enter them. To many, however, the strenuous life of him who has to seek as well as to earn in daily struggle will always seem more manly and more noble than the methodical work of a salaried servant, even of the Government.

G. A. T. M.

On Reflection.

The Housing Problem Again. THE first step in the carrying out of any reform is the recognition of a need for reform. By this we do not mean merely the lazy admission, which everyone is willing to make, that "something ought to be done," but the strong determination to find a remedy for the evil, if a remedy exists. That first step has at length, we may fairly claim, been taken in regard to the question of the housing of the working classes, to which we have so frequently adverted in these columns. In spite of the preoccupation of the public in matters of colonial and foreign policy, the question has come distinctly to the front within the last few days. Lord Rosebery, Mr. Ritchie, Mr. Asquith, and Sir Henry Campbell-Bannerman have all been devoting attention to the subject, and all have recognised its extreme urgency and importance. "Here is a grievance," said Sir Henry Campbell-Bannerman, "to which the complaints of the Transvaal Outlanders are a mere empty cry. Here is a peril at your own doors greater than can come from any Boer aggression. Here are destruction and misery exceeding that of war working and waxing in the houses of your own people." These are strong words, and we welcome them, not for their reference to a current controversy, but for the assurance they afford that the housing problem has now entered the domain of practical politics, and will be pressed to a definite issue—at any rate if one of the great parties in the state has its way. But in truth this is not a party question, and we hope it will never degenerate into a subject for barren political controversy. The problem is large enough and urgent enough to demand the best energies of the best men of all parties, and if these are freely offered we cannot doubt that, in spite of enormous obstacles, a satisfactory solution will be found. One thing is eminently satisfactory: no one has demanded a Royal commission or a committee of inquiry. Fifteen years ago a Royal commission sat on the subject, and its recommendations have not yet been carried out. We are now, let us hope, too much in earnest to adopt that familiar method of shelving an awkward problem. The facts—the horrible, disgraceful facts—of overcrowding and its attendant evils are well known, and it is felt at length that what is needed is not inquiry, but action.

Some Suggested Remedies. THE housing problem resolves itself into two parts—the removal of insanitary dwellings and the provision of sanitary ones for the population displaced. Municipal authorities have too often made the mistake of devoting attention almost exclusively to the first part of the problem, with the result that the clearing of an insanitary area has sometimes positively aggravated the overcrowding; a slum district is destroyed and the displaced populace, finding no provision made for them elsewhere, crowd into the neighbouring houses and form a new slum district. The process must be reversed; before an insanitary area is cleared, houses must be erected elsewhere for the population to be displaced. Of course it is extremely difficult, as well as extremely expensive, to find sites for building in the London area, and Lord Rosebery proposes, in order to meet this difficulty, that the London County Council should obtain powers to acquire land for artisans' dwellings outside the present area of the Council's jurisdiction. The suggestion is a good one as far as it goes, but there are thousands who could not avail themselves of a home in a rural district, however attractive it were made. They must live near their work, and their work is in the heart of the City; for such the policy of erecting, wherever possible, the so-called "model" dwellings must be continued. And for large numbers of others a cottage in an outlying district would be a white elephant, unless cheap and expeditious means of locomotion were available. The housing question is closely bound up with the locomotion question, and that again involves not only additional workmen's trains, trams, or motor cars, but also additional or enlarged termini. There must be some changes in the law before the housing problem can be effectively grappled with; for instance, that elusive personage the slum owner must be tracked out, registered, and compelled to bear a share in replacing his insanitary property by decent habitations, so that the cost of a spirited housing policy shall not press unfairly upon the ratepayers. But it should not be forgotton that much may be done by enforcing the provisions of Acts already in existence; therefore, all who hope for a satisfactory solution of this grave problem would do well to follow the advice given by Lord Rosebery and endorsed by Mr. Asquith, and elect to the local governing bodies, men whose hands are clean and who have no axe to grind in opposition to the public good. We should like also to see an experiment made in the direction of a concerted migration of manufacturers from our crowded cities into rural districts, on the lines advocated by the Garden City Association. But one thing is clear: there is no panacea for the evil of overcrowding, but there are many means by which the evil may be diminished. We must work along many lines, not talking too much of milleniums and ideals, but prosecuting vigorously any plan of action which promises even a limited alleviation of what is becoming an intolerable evil and a deepening disgrace.

Our Future Craftsmen. THERE was held last week in the Medical Examination Hall on the Thames Embankment, an exhibition which "superior persons" would have passed by with a supercilious smile, but which was in its way as important and significant as anything to be seen in the Bond Street galleries. This was the annual exhibition of work—drawings, woodwork, metalwork, &c.—done by scholars in the London Board Schools. It would be absurd to criticise these juvenilia from an artistic point of view. But the interest of the exhibition lay not in individual examples, but in the bulk of the work and the evidence it afforded of the kind of instruction that is being given in our schools. The School Board, of course, does not attempt to turn out artists or skilled craftsmen, but rather to train the hand and eye; and it is matter for legitimate satisfaction that thousands of the craftsmen of the next generation are gaining in our Board Schools some sense of form and colour, and some slight appreciation of the beautiful, and are even making tentative efforts in design. The boy who has undergone two or three years' training in drawing and in wood or metal working is likely to have a juster sense of the dignity and importance of the handicrafts than he whose schooling has consisted entirely of "book work." In place of the ignoble contempt for manual labour which causes so many of the brightest scholars to swell the over-crowded ranks of commercial clerks, his ambition will be to make beautiful and useful things, and make them well; such at any rate should be the tendency of much of the teaching now being given in our London Board Schools. School Boards are often criticised for their lavish expenditure, but if their efforts tend even in a slight degree towards a revival of handicrafts and an improvement of the standard of British workmanship, the money spent is a first-class investment, which it is the most short-sighted parsimony to begrudge.

HENRY J. TREADWELL, F.S.I.

Men Who Build.

No. 57.

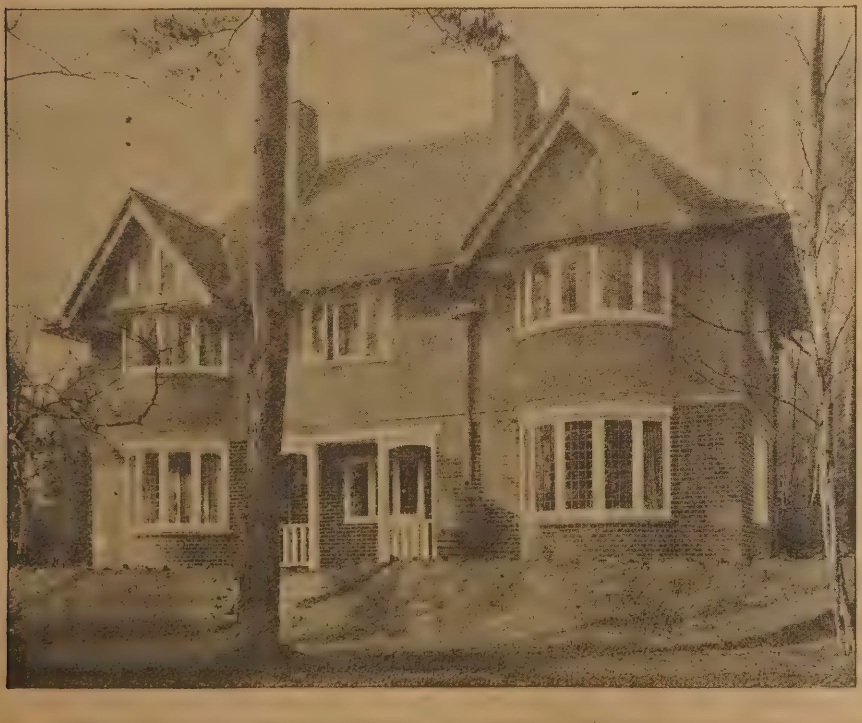
TREADWELL AND MARTIN.

As there is for objects of art no such chastening and perfecting influence as Time, so there is nothing so whimsical and problematical as the values which the apparent caprices of posterity will ascribe to the fashions and adulations of a past age. A Milton may die unknown to his country, and his name finally become a household word, and his virtu and artistry find acclamation and veneration for hundreds of years wherever culture dwells; while the name of a Thomas Haynes Bayly, who was the darling of his hour, and had the bosoms of every maid and matron swelling to the lilt of his verses, is beyond the remembrance of the generation of his own children. If we turn to architecture we may find a similar state of affairs. The castles and mansions of our mediæval nobility, the houses, mills, barns and cottages of our merchants, farmers, and peasants in the centuries gone by, which were fashioned often enough to satisfy little more than an instinct of fitness in their owners and a professional self-respect in their builders; and which rarely, if ever, enjoyed more than a passing and local celebrity at the time of their genesis, yet draw untiring crowds of American ramblers across the Atlantic every summer, and are the subject of endless poetry, speculation, exposition, and analysis. On the other hand we find the distinguished achievements of the disciples of Horace Walpole, whose efforts to revive Gothic architecture awoke the widest popular enthusiasm for architecture which this country has even seen, are now (and with great discernment and propriety as we are convinced) passed by without regard or attentiveness. The reasons for this enigma of taste and of Time are complex, and various phases are frequently brought under discussion and review. It will suffice here to say that it would seem that the essential attribute of a great school or epoch of art is that it should be always linked with the life of the people; that it should express the hopes, fears, and ambitions of a nation, or reflect truly and sympathetically the customs, etiquettes, behaviour, and social ideals of a past condition of the community; and the nearer the art approaches the nature of the art of the craftsman the more inexorable does this rule become.

This leads us to the subject of these remarks, for the work for which the well known firm of Messrs. Treadwell and Martin is particularly distinguished seems to us to be precisely that which will be recognised by our great grandchildren as the salient characteristic of the opening years of the twentieth century. We have a vague complacent sense of assurance which persuades us that the cult of conscious, trained, individualist artists in the decorative arts, represents what we may clumsily term, the art industry, of the country. But this is by no means the case. The distinctive architecture of the present epoch of English history, as it will, without question, be viewed by the archæologists of posterity, consists in the architecture of the nation, which in this democratic age of commerce and manufacture consists in long rows of villas with bay windows and clumsy imitation ornament, factory chimneys, warehouses, technical and educational school buildings, town halls, and, most conspicuously, restaurants, hotels, music halls, theatres, and public-houses. Nothing but hopeless prejudice can include church building as a conspicuous function of modern architecture, for though large sums are subscribed to the reparation and restoration of our cathedrals, money for new churches is grudgingly tendered; and though expensive stones, marbles, and metal-work, richly ornamented, are lavished upon hotels, restaurants, theatres, and public-houses, few, indeed, are the churches that are now built with any other material than brick, and few of them have so much marble as is unhesitatingly granted to the lobby of a provincial public-house. It is unnecessary to press this matter further; the real scope for modern architects, the true field where the æsthetic instincts of the nation should be emphasised, are those already enumerated, and these, it will be seen, are almost precisely those ignored by architects of repute.

LEONARD MARTIN.

The work of Messrs. Treadwell and Martin is, in one of its several phases, conspicuous for having attacked and demolished a tacitly acknowledged, though unformulated, principle of architectural practice. It is accepted by implication, that the astute, vigorous, business qualities, and facile ingenuity for overcoming the thousand obstacles incidental to the finishing of a hotel or restaurant so as to pay interest within of a few months of its erection, have altogether precluded the introduction of sound æsthetic principles into the architectural composition of the building. It has been said of the theatrical architect that he is a financial agent first, and an architect afterwards, and though this is a manifest hyperbole, it truly indicates the huge responsibility incurred, and the wide activities which are essential to success in such work as that with which the name of Messrs. Treadwell and Martin is most prominently associated. Nor does the success which the firm enjoys in its combination of profession and art altogether refute the general ideas upon the subject as above described, for responsibilities are shared between the partners in such a way that the essential business activity is identified with Mr. Treadwell, while the architectural distinction of the firm is chiefly attributable to Mr. Martin, who is thus able to complete designs without those extraneous anxieties and pre-occupations

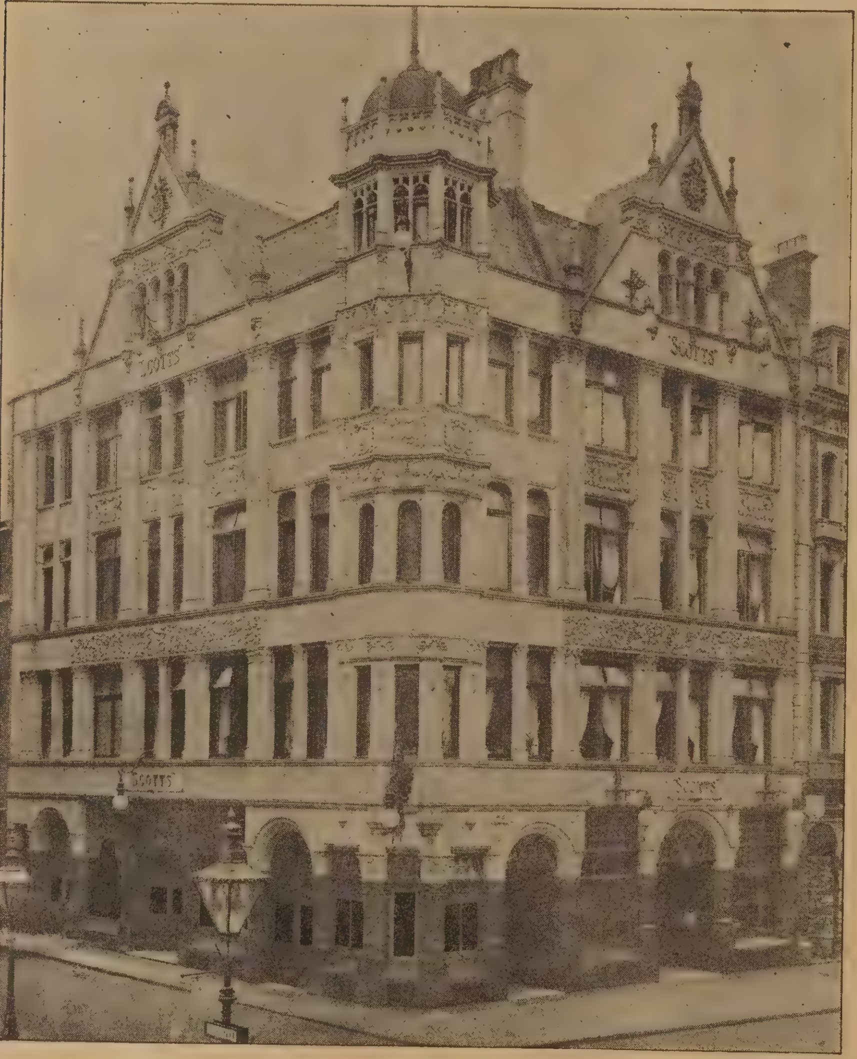


DEEPDENE, FRIMLEY GREEN, SURREY. TREADWELL AND MARTIN, ARCHITECTS.

which are so inimical to a good plan and well composed elevations.

The firm, which among other enviable distinctions has that of youth (the united ages of the partners not amounting to seventy years) has been in existence some eight years, during which period it has completed a large number of important works, as a reference to the foot of this article will show, and won one of the largest and most keenly contested public competitions of late years. A plan of this building, no other than the Southern Hospital at Carshalton, is shown in the accompanying illustrations.

Mr. Henry J. Treadwell, the senior partner, was educated at Windsor and articled to Messrs. Franklin and Andrews, surveyors. He is a fellow of the Surveyors' Institute, and during his student days won the coveted Driver prize. Mr. Leonard Martin was educated at Dulwich College, and was articled to Messrs. Giles, Gough and Trollope, architects, of Craven Street, Strand. His architectural training was supplemented by studies at the South Kensington Art Schools, and he became a student of the Royal Academy Architectural School. The practice of the firm has been considerably varied, and includes churches, private houses, breweries, stables, shops, and hospitals, besides the hotel, restaurant, and public-house designs which make up the greater part of the accompanying illustrations.



SCOTT'S RESTAURANT, TOP OF THE HAYMARKET. TREADWELL AND MARTIN, ARCHITECT.

Messrs. Treadwell and Martin, as has been already suggested, claim to be among the first to realise that public-house work need not be necessarily identified with design showing bad taste and ignorance of the true principles of composition, and they are perhaps the first, as they are certainly the most conspicuous, of those who have exemplified this conviction in their work. Work of this class throws responsibilities upon the architect which are involved in no other sphere of practice as has been said, and there are other petty annoyances and unpleasantnesses that perhaps do not so readily occur in other branches of professional work; but the architect who essays to design hotels, and in particular public-houses, is at least in this enviable position, that he is, within reason, given a free hand, and in many cases he is at liberty to use the richest and most costly materials and labour without restriction or limit. This then is the substantial privilege accorded to those who essay to practice in what is undoubtedly the most active sphere of national art at this present time, namely, that the architect is free to express the complete idea of his design without the numberless distracting limitations of cost which beset the practices of most men; and though the natural tastes of Messrs. Treadwell and Martin lie, in common with that of most architects, in the direction of the ecclesiastic and domestic styles, which, by the way, are precisely those classes of buildings in which the restrictions of cost are most notoriously prominent, the satisfaction of putting up buildings in accordance with their ideas of what they ought to be goes far towards effecting compensation for the somewhat shallow and trivial notions upon which the conception of the building must be based. Idealisation of the yearnings of the paunch and gullet, and the expression of those barbarous joys of glitter and light and appetites half-way towards satiety, must always be at a discount when compared with the idealisation of domesticity and the glorification of the sacred superstitions of our ancestors. Yet, on the other hand, the growing number and size of hotels shows that the sentiment of domesticity is not a distinguishing feature of this present age, and the capital, the activity, in short the enthusiasm, bestowed upon these establishments, and upon conveniences for eating, drinking, laughing, and making jollity, are an infallable indication that therein lies the true sphere of labour of the nineteenth-century architect. It is the natural and proper occupation of professed sightseers, of archæologists, and, of course, of the ladies, to dawdle and speculate among the relics of the past; but the activity of the artist, and above all of the artist in buildings, should lie in the present. It is his privilege—nay, his duty if he has any such obligation to his art—to decorate and idealise the life and ideals of the nation and the community of which he is a member. It is a perverseness of the Fates, surely, that the Greeks could depict Bacchanalian indulgence, at once, literally and yet beautifully, and without offence, while, should a modern architect dare to sculpture in his pediments supine beer-fuddled navvies in heaps right and left, and the waistcoat of the publican rising centrally like a moon over the horizon line of the counter, he would be ridiculed and ostracised as a professor of the art. He would be removed from the rolls of the R.I.B.A.

Of the designs reproduced in these pages little need be said. They explain themselves They cannot be readily traced to any traditional examples, but though they show an individuality which would anywhere identify them as having emanated from their designers, and from no one else, they yet bear a quality which is common to a good deal of emphatically "modern" architecture. They indicate an indirect sympathy with the traditions of the early French Renaissance, and they also, less emphatically, show traces of the inceptive spirit of design which has sprung up among us only within the last ten or fifteen years, and of which the germ was perhaps sown by Eden Nesfield. This quality is particularly noticeable in the wrought-iron signs shown in one or two of the illustrations.

The following is a list of Messrs. Treadwell and Martin's best-known works:—St. Cyprian's Church, Waltham Cross; Memorial Church of St. John, Cobham; Mission Church, Burnt Mill, Herts.; private houses at Cobham, Sanderstead, and elsewhere; Scott's Restaurant, Coventry Street, London, W.; The Leicester Restaurant; The Rising Sun, Tottenham Court Road; The Old Shades, Charing Cross; Golden Cross Hotel, Charing Cross; Norfolk Square Hotel; Bath and Cheltenham Hotel; Best and Co's Brewery, Clapham; Ashby's Brewery, Cobham; premises, 31, Maddox Street; Parochial Schools, Cobham; Southern Hospital, Carshalton.

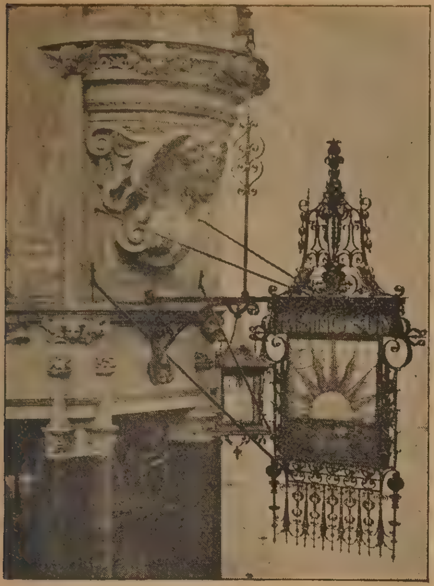
At the Derbyshire Royal Infirmary Convalescent Home, at Holbrook, acetylene gas is used. The cost of the building has been about £6,000.

The new Church of St. Peter, Bury, is being carried out from designs by Mr. Medland Taylor, of Manchester. The church, which has been partially taken down, is modern, having been built in 1871.

The Hospital for Diseases of the Throat, Nose, and Ear in Golden Square, London, W., which was founded by the late Sir Morell Mackenzie about thirty-five years ago, has been enlarged and practically reconstructed at a cost of £10,000.

Three Towns Architects.—At the inauguration of the fourth session of the Three Towns branch of the Devon and Exeter Architectural Society, held at Plymouth on Wednesday last, the chairman, Mr. H. G. Luff, A.R.I.B.A., expressed the hope that Registration would soon become a matter of law.

The late Sir Thomas N. Deane was not (writes Mr. Thomas Drew, the cathedral architect) connected with the restoration of Christchurch Cathedral, Dublin, as stated in our obituary notice last week. This work was carried out between 1870 and 1876 at a cost of £180,000 from designs by Mr. G. E. Street, R.A.



ILLUSTRATED SIGN AT "THE RISING SUN," TOTTENHAM COURT ROAD, W. TREADWELL AND MARTIN, ARCHITECTS.

ARCHITECTURAL ASSOCIATION.

MARBLE.

By W. BRINDLEY.

(Concluded from page 231, *No. CCXLIX.)*

WE have in Derbyshire extensive deposits of a beautiful decorative stone, that is used extensively for interior work, and which comes in cost between marble and stone. I mean the sulphate of lime, alabaster. This must not be confounded with Oriental alabaster, which is a carbonate of lime, and hard, while our English alabaster is comparatively soft, but tough and takes a good polish. For monumental work it has been used since the thirteenth century (and in the old Norman Church of Tutbury there is an arch of it), and during the Decorated and Perpendicular periods, it became the material most used for effigies and altar tombs, most of which are very beautiful; but the grandest period for its use was the English Renaissance. The important monuments erected in this style are artistic productions with an individuality of which we have reason to be proud. Just look at the examples in Westminster Abbey; their delicate and bold mouldings in contrast, the alabaster with a dull polish, only sufficient to show the colour; their inscription slabs and columns of black marble, the whole effect heightened and brought together by a judicious use of colour and gold; further to perfect their colour scheme, they sometimes diapered their black shafts with delicate surface work. Their inscriptions were cut with a flat ground, not V-shaped; the result is they are readable at any angle. In regard to the modern finish and polish of alabaster my conviction is that in intricate and delicately moulded work, with carvings and sculpture, glass polish is a mistake. And as alabaster is used instead of marble on account of cheapness, if we leave out the polish we further reduce the cost. Nothing looks worse than some parts polished and others not. Sooner than polish carvings, do as the mediæval men did, gild them. In Rouen Cathedral is a splendid monument of the time of Francis I., executed in English alabaster. In the north of Spain, near Bourgos, we find grand monuments, made in a delicately yellow-tinted alabaster nearly as hard as marble. The old workings would appear to be lost; I have spent much time in trying to find them, without success, although I found an inferior variety something similar. Alabaster is an excellent material for lining the walls of hospitals, as it is non-absorbent, and is not affected by acids. It contains about 50 per cent. of water, and is so hydrated that it will not absorb any more liquid, but if heated to over 200 degs. Fahr. it parts with its water, and turns to plaster of Paris, so it is not suitable for chimneypiece work next the fire. Most of the imitation marbles that periodically appear are baked alabaster, which will then absorb any fluid colour you like to apply. The Italian statuettes we see so much are often only white translucent alabaster of Voltera, which is boiled, producing an effect similar to statuary marble.

Granites.

A very important industry that has made immense progress in the last thirty years is that of granite work. The Scotch of Aberdeen are entitled to the credit of this revival, which may be accounted for by the superior quality of their granites, their greys, reds, and rose colours being excellent. The amount of work they do in monumental work alone is enormous; immense quantities of this class of work go to America. The last few years has made us acquainted with the beautiful granites and labradorites of Norway and Sweden. These the Aberdeen workers import in rough block. It is only of late years that granite could be sawn economically. This is now done by the aid of chilled iron shot, or crushed steel, which are American inventions; and lately they have given us another still harder material—carborundum. This is next to the diamond in hardness, but it appears to lack toughness, as it soon crushes up into mud. There has been used within the last few years, in our street buildings, a large amount of polished granite work, and when it is broadly detailed and kept to one tone of colour, it looks well. But I do not think we should like to see Waterloo Bridge and the Embankment polished, and certainly polished cemetery work generally looks very hard and uninteresting, while all monuments designed on Celtic lines are ruined whenever polished. Further, nothing can be worse than trying to get effect by cutting off the polish to produce a pattern. Of all decorative architectural stones ever discovered, none has yet been found to surpass the Imperial Egyptian porphyry of the Romans; its purple colour is unique, and this colour it will retain for ages unimpaired; it is rich, but not gaudy, and is one of the chief colour glories of the churches of Rome. What would Henry III's tomb look like if the porphyry slabs were removed? Porphyry columns are the chief glory of St. Sophia in Constantinople. The old quarries of Mons Porphrities are only about twenty miles off the entrance to the Gulf of Suez. There is an inexhaustable quantity of the choicest material remaining, and through the Suez Canal it can now be got to Europe at a very reasonable cost, and with improved methods of working might be available to us for structural decoration, the same as it was with the Romans. The only thing wanted to achieve this is twenty-five miles of tramway; there is a regular gradient of one in eight all the way to the sea, and only brake-power is wanted to regulate the rate.

Museums.

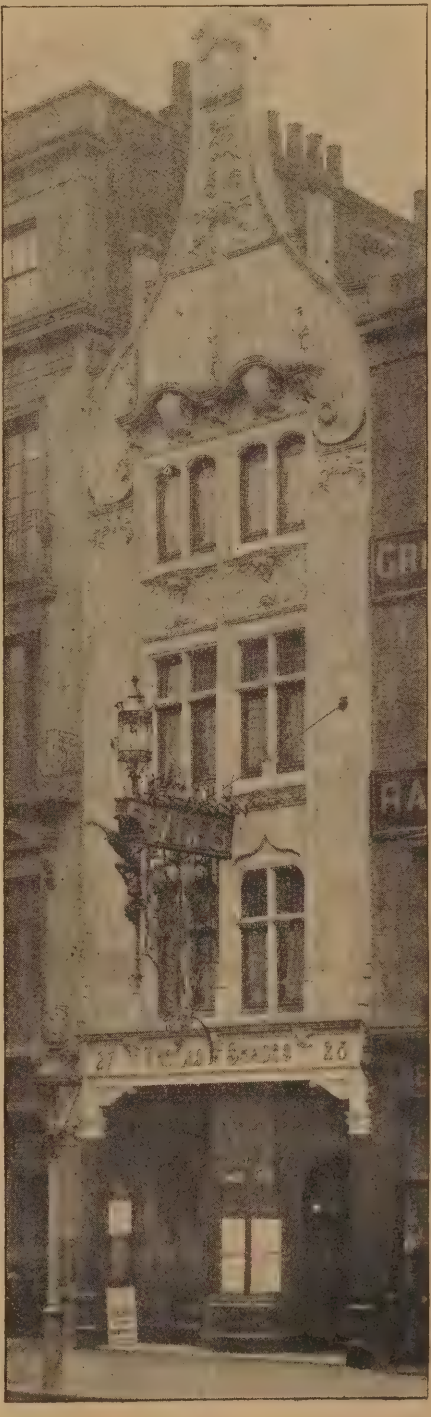
A very complete collection of the marbles of the United Kingdom will be found in the Museum of Practical Geology, and also in the Natural History Museum. Foreign as well as British specimens are fairly collated. Then again, in the British and South Kensington Museums many interesting pedestals and works of art in coloured marble may be seen, also good examples of Roman pavements. In the University Museum of Oxford is the famous "Corsi" collection, consisting of 1,000 specimens; these, I am delighted to say, have now fallen into the keeping of Professor Miles, who has had them placed in a good light; many at present are in drawers, but he will be pleased to show them to anybody interested. There are two similar collections to the "Corsi," made by Signor Belli; one is in Brussels, the other at the University Museum in Rome. The Museums of Edinburgh and Dublin have each a fine collection, chiefly British.

Polish on Marbles.

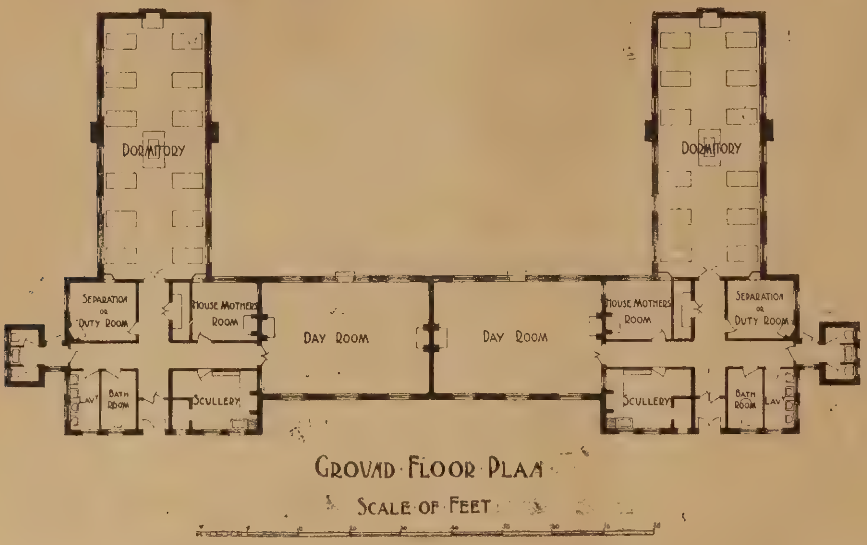
Labour with the classic Greeks was of little consideration, as they certainly finished their works regardless of cost, but their white marbles in Architecture they never polished (except the joints where it could not be seen), everything was left from the tool. There were no bright shining surfaces to reflect and injure the form. Polish you do not see anywhere on the Acropolis of Athens, and in the hundreds of beautifully sculptured "stela" of the museums of Athens, London, Paris, and Berlin you find nothing but tool finish. For London and English towns, with our smoke and dust, we may require a finished surface that dust will not cling to, but I do not think bright polish helps us very much, for we all know how dirt will even cling to the surface of glass. Coloured marbles, to bring out their beauty, have to be polished, but even in these, glass polish has sometimes a garish look.

Marble Pavements.

The pavements of the Egyptians and Classic Greeks were close-jointed thick slab blocks. Later the Greeks produced a few examples of tesselated mosaic. But the most important pavement period was undoubtedly



"THE OLD SHADES," CHARING CROSS, W.C. TREADWELL AND MARTIN, ARCHITECTS.

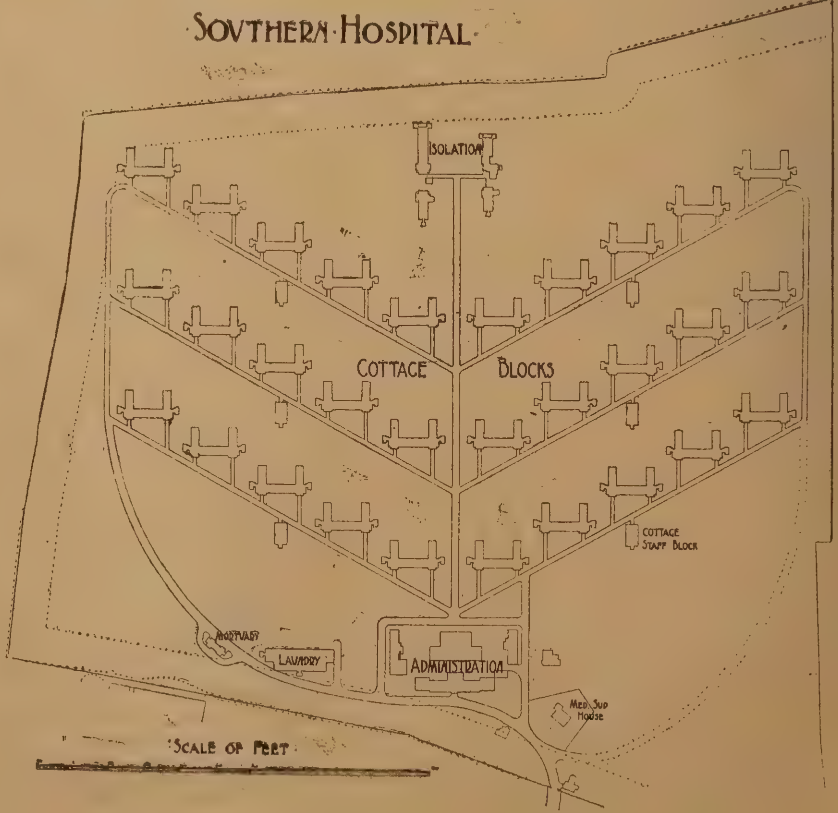


SOUTHERN HOSPITAL, CARSHALTON: DOUBLE COTTAGE BLOCK. TREADWELL AND MARTIN, ARCHITECTS.

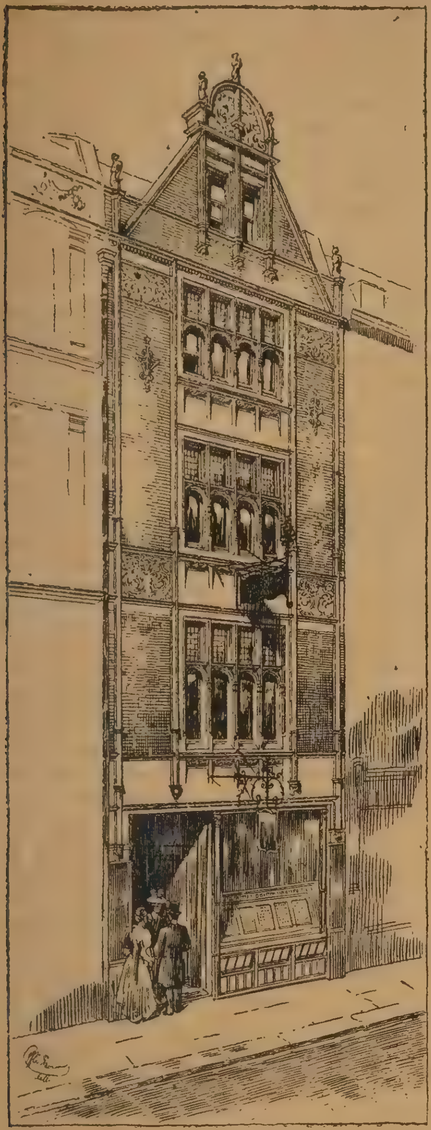
that of the Romans, which, in the beginning of the empire, was a continuance of Greek designs and methods, most likely executed by Greek artists and workmen. The universal system soon became throughout Rome and her extensive colonies, that of tesselated mosaic, which they executed in such a way that has never been done since. Just call to mind the infinite variety of design seen in these pavements; many are figure subjects, heads, and every description of animated life, from fish of all sorts, swimming in the waters, shell fish, and nets on the beach, animals of all types in quick motion and passant, grouped and posed naturally and artistically, in a way that few artists even now can equal. In addition to all this animated drawing, tree foliage was treated freely, growing, full of life, but adapted in the ablest of design to its purpose; plants of all sorts were grouped, and conventionalized, to fit their position. Leaves and flowers arranged as circling wreaths, others as borders, straight and curved, of fret and guilloche, interlacing round circles and angular forms, with the greatest of ease and freedom. All we now know and can do by the aid of reference help, the Romans knew in the third century A.D. They also knew how to execute durable work by having a good, proper foundation, and using tesseræ three times as deep as ours, making that much firmer key. How little we know about the artists and art workers of these Roman tesseræ pavements. It would appear that with every Roman legion there must have been a corps of sappers and miners, as they practically found everything in the way of useful rock and mineral veins, which they worked on scientific methods. They, further, must have had a sort of artists' corps, consisting of art designers and workers, or these art pavements never could have been produced. We may ask what became of the art in this and other colonies when the Roman occupation ceased? It would appear to have departed with them, as the pavements which had been universal now became obsolete. The art never went quite out in Italy, as the Popes were always caring for old pavements in way of removing and repairing, and at Venice the enamel mosaics of Murano kept the art alive. The modern revival we have to thank the French for, in the building of their Opera House, and the importation of Venetian workmen to carry out their designs. From France the art came here, and soon spread throughout Europe and America. For these pavements a good concrete foundation is absolutely necessary, and it ought to have time to draw out. The method of sticking the tesseræ on a paper cartoon, which is turned over and rolled or beaten into the coating of lime plaster, and afterwards rubbed down with soft grits, is familiar to all. When large slabs of colour are introduced to get contrast, it is necessary to insert a dummy slab of common stone while the beating of the tesseræ is being done. The dummy slab is then broken up to get it out; this does not disturb the bedded tesseræ. Wood will not do, as it swells with the wet. The Romans sometimes used tesseræ of 1in. covering large areas with one colour only, in red or green porphyry or Giallo Antico. The effect is very imposing when enhanced with a flowing border of great width, as seen in the Baths of Carracalla. These 1in. tessera of marble in black and white in a variety of patterns are used for the street pavements and public squares of Lisbon, and answer well, as it is very hilly. Where the Roman patterns have been enlarged, however, they are most trying, almost making one dizzy to walk over them.

Sectile.

The sectile or slab pavement, arranged in different patterns of marble and porphyry, is very effective. There are examples in Rome on the Palatine, the Basilica of Julia, and the Pantheon. I think the simplest are the best. These are large slabs of rich marble, opened out with only a border slab of another colour round, such as large slabs of Pavonazetto opened out with simple borders of yellow statuary. Also Pavonazetto slabs, with St. Ambrozio Verona for border is a success. Carystian Cippollino so treated, with Verde Antico bands, makes a rich but retiring pavement. Pavements of marble squares, black and white, have been used in England since the sixteenth century, if not earlier; they are bright and clean, very durable, and not costly; red and white is also good, but I prefer the black not polished, which is a soft grey black; these now have in a great measure superseded encaustic tiles. The Opus Alexandrinum pavements which abound in Rome (there is also an example of which we have in Westminster Abbey) are geometrical patterns made with porphyrys and marbles, the grand effect being produced by the "values" obtained by large circular slabs in contrast with delicate pattern work. The large circles are section slabs of Egyptian porphyry columns, the smaller circles are usually green Porphyry of Laconia. This is because you can get large slabs of Egyptian porphyry but not of Laconia. The grand pavement under the centre dome of St. Mark's, Venice, which consists of twelve Carystian slabs making a square 30ft. by 26ft. with a rich mosaic border all round—you will all remember the Ruskin Street controversy as to its irregularity—is now levelled and done up; and not this alone, but most of the pavements in the church and nearly all the grand ones which are the glory of Rome have been all made "bran new" in the last few years. Another sort of pavement, very effective, are the Florentine ones of the Baptistery and San Miniato; they are foliage and figure pattern inlays of black-green Verde de Prato into white. The subject is always the white slab. The same treatment is applied to the wonderful pavement of Siena Cathedral. In designing marble pavements as few colours as possible should be used, and the work put on a good foundation. The Italians and French during and since the Renaissance period have used marbles and porphyrys in various ways for furniture and objects of vertu. Many of the Florentine and Milanese tables are real works of art and



BLOCK PLAN OF SOUTHERN HOSPITAL, CARSHALTON. TREADWELL AND MARTIN, ARCHITECTS.



31, MADDOX STREET, W. TREADWELL AND MARTIN, ARCHITECTS.

costly productions. They further introduced marble plaques into ebony cabinets, which are still sought after by collectors. The various French works in marble and ormolu, especially of the Empire period, are generally refined and good. Much of this class of work made by the Chinese and Japanese is good and suggestive.

Monuments.

From the time of the Early Egyptians down to the present the best materials obtainable have been employed for memorials to the dead. With the Egyptians no stone was too hard or too difficult to work. The Greeks chiefly used marble, and all who have had the pleasure of studying their monuments in the museum of Athens cannot help being impressed with their simplicity and beauty. Each one tells its own tale at a glance, without attempting to decipher the short inscription. Architecturally there is a great variety. The "Stelæ" have mostly a flat pediment, to throw off the rain, with simple mouldings; the profile sections are flattened on the face; the sides invariably taper; the simpler have a relief panel of two or three figures, showing the farewell shaking of hands, with often the faithful dog looking on; nothing can be more pathetic. The more important have sculptured figures in high relief, often two-thirds life size. The sculpture comes boldly in front of the side pilasters. The whole thing gives the idea of the design and execution being by the same artist. I do not think they are "Art and Craft" productions. We are much indebted to Dr. Murray, of the British Museum, for bringing out of the basement and dark stores an interesting collection of these monuments. He has placed them in a good light, in a separate room, at the end of the Parthenon Gallery. South Kensington has some good casts, which might, for educational purposes, be added to. The Greek sarcophagi were always refined, and are well worth study. The museums have usually obtained those that are richly detailed and filled with sculpture, but simple moulded ones, like the one at Gergenti, I think show better the Greeks' skill in subtlety of detail. The Romans at the first worked on Greek lines, but later got into a bold and unrefined type of work, especially in their sarcophagi and altar form of monument. But, like the Greeks, their small sarcophagi, and urns for funeral ashes, are of great variety, beautiful in form, and, as marble work, exquisitely wrought. The British and Soane Museums contain excellent collections. The Byzantines made sarcophagi of enormous dimensions in porphyry and Verde Antico. They were large enough to take the deceased in full robes; the designs were simple in detail to suit the coloured material. The Verona tombs of the Scaligers of later date are much on the same Etruscan lines.

Christian Monuments.

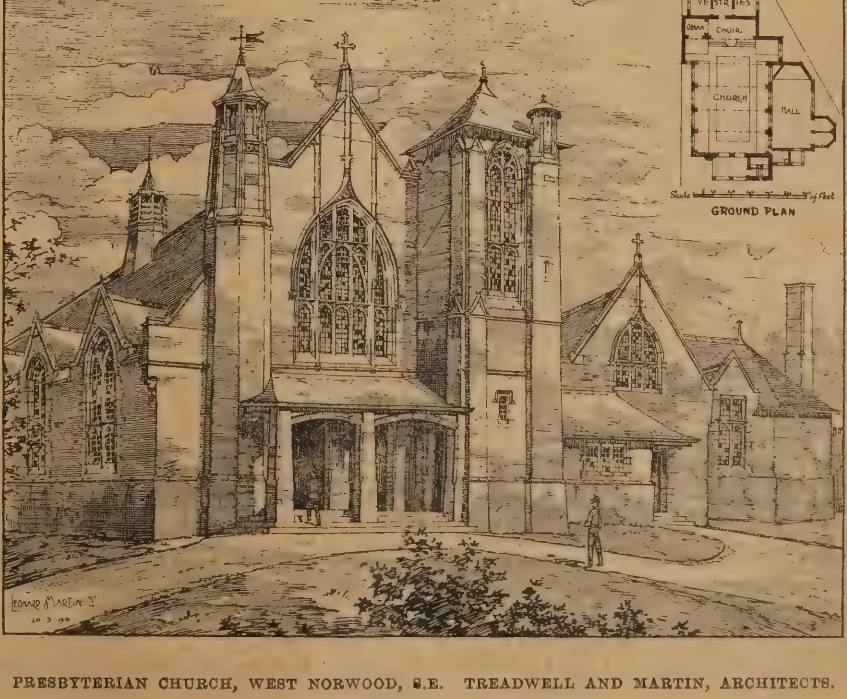
How interesting most of the cathedrals and old churches of this country and the Continent are, owing to the Christian monuments they contain! Many of these buildings are real museums, the monuments giving the history, national, parochial and architectural. Unfortunately, owing to church restoration, we have lost many, while others have been skied where they cannot be seen. The want in many of our cold-looking church interiors is colour. This could be very much helped by coloured marble monuments. How cold most of the white monuments in St. Paul's Cathedral look, many of which are very costly, but how little they add in way of colour! Contrast the sculptured ones with the Parthenon sculptures that we now know had colour pattern on them, or the beautiful works of Donatella and others in Italy, where gold and delicate colour are freely used. But we need not go abroad for colour precedent, when all our grand monuments in Westminster Abbey, from Henry III. down to James I., are full of colour. For modern work in sculpture, Rosso Antico, Giallo Antico, and Black produce good work, especially for reliefs. The Romans and Florentines have left us numerous examples in most coloured marbles. There ought to be an effort made to get back memorials into our churches, for it is sad to know that a person who has been a constant worshipper in a church, who has taken interest in parish affairs, and done good in various ways, should at his decease have no simple record placed to his memory in his church. He is buried in some distant cemetery amongst thousands of others who have piled over them masses of marble or granite void of merit in design. The friends of the deceased feel bound to erect what they call an imposing monument or it will never be noticed. Now, would it not be better, instead of placing a costly pile in the cemetery (where it is frequently not seen until the next interment), to erect over the grave a simple record in durable material and place on the church walls a small but artistic monument—I say small, because the church walls can only hold a certain number? If the memorial is to a man entitled to arms, then give him his arms and a short inscription; or it may be a small panel of sculpture, portrait, or anything appropriate with colour. By this means we enrich the church and record the deceased; but little can be done until the clergy can fully appreciate its importance; and if they give permission—not, say, to the artist—it must be in this style or that to suit the church or match some poor one already there.

Jointing.

Masonry jointing for built work is the proper method, but when marble has to be applied to iron construction, as in the covering of stanchions and girders, special methods have to be adopted, the things to guard against being expansion and vibration. In wall surfacing with marble slabs, vertical angle joints, with a mitre quarter of an inch square check, answer very well; and in strongly-marked marble mouldings going round a tablet, or even small opening, the ordinary picture frame mitre is the best for effect. In the fixing of slab work it is best to leave a small open space at the back, and use bronze clamps with a projecting notch to prevent the slabs being knocked inwards. In the jointing of chimney-piece work heat expansion and contraction in some cases has to be provided for. I find when a piece of marble 1ft. in length is heated up to 230 deg. Fahr. it expands about one-thirtieth of an inch; at 300 deg. Fahr. one-sixteenth; and up to red heat one-eight; but in each case on cooling it only contracts half of the expansion.

Chimney-pieces.

For skill in chimney-piece construction we must go back to early Monastic times. Then builders found out that a long lintel in one stone could not resist breaking when over their large wood fires. To obviate this they jointed their "heads," using some form or other of wavy or stepped joint. And when



PRESBYTERIAN CHURCH, WEST NORWOOD, S.E. TREADWELL AND MARTIN, ARCHITECTS.

marble is similarly exposed to a great heat this is the only safe method of jointing. North Italy, in the provinces embracing the cities of Genoa, Florence, Venice, and Milan, was the country for early chimney-pieces, dating from 1400 to 1600. Venice, owing to its local building material, being Istrian or Verona marbles, "was always a marble-working city;" in addition to these they brought from Greece, along with their coloured columns, blocks of white. Istrian stone or marble, which is hard, and receives the most delicate chisellings, was the favourite material. The designs, which are Renaissance, mostly consisted of rectangular projecting canopies, with architrave, frieze and cornice supported by corbels well built into the wall, under which are pilasters or ornamental columns with caps and bases. Most of the chimney-pieces are beautiful in design and well executed. The "antique-mongers" of Florence and Venice have grabbed them whenever they had a chance, and they copy and make "new old" ones to the fullest extent by staining and smoking over wood-shaving fires until it will almost defy any expert to say if they are new or old. So I advise you when buying these chimney-pieces to purchase them on their merit and not as antiquities; then you are safe. Belgium, which is a marble country, has produced many good canopied chimney-pieces. The most famous is the grand one in black marble at Bruges. France is perhaps the richest country for good chimney-pieces in every style and date; they are found in every old palace, château, and castle; there is a series of simple ones in the rooms of the Louvre in Paris, one in Egyptian porphyry, another in lapis lazuli, another in Rosso Antico, and so on. These have ormolu mouldings. The refined Adam's ones take a lot of beating, either in design, execution, or economy of good material. The original drawings of many of these are in the Soane Museum. A bold "ovolo" moulding in coloured marble all round the fireplace opening is always safe. In conclusion, I will say, in designing use as few colours as possible in your work, and the nearer you keep to one the better.

THE DISCUSSION.

Dr. A. S. Murray, in proposing a vote of thanks to Mr. Brindley, thought there was one little contentious matter in the paper, and that was in regard to the colour of the Parthenon. A year or two ago a young American student examined the architrave of the Parthenon very carefully and also examined the sculpture in the British Museum, and he came to the conclusion that both had been covered with a thin translucent size or coating of crushed marble, which had the effect of taking the roughness off the marble, and also enabled the decorators when painting on the patterns along the architrave to paint with great rapidity and beauty. The only way he (the speaker) could reconcile these theories with Mr. Brindley's was that the size had been made from marble having iron in its composition.

Mr. Bolton, in seconding the vote of thanks, considered the most satisfactory manner in which to treat marble pavements was in geometric designs.

Mr. Fellowes-Prynne could not agree with Mr. Brindley as to the need of keeping to one colour throughout in the decoration of churches; it was the glorious diversity of colour in Saint Mark's at Venice which made it so sublime.

The vote of thanks was then passed with acclamation, and in reply Mr. Brindley said he quite agreed with Dr. Murray and the American student that the Parthenon sculptures had been coloured. In reply to a question by Mr. Andrew Oliver, he said the only ancient tools used in working the stone that had been found were Roman ones of steel. He was afraid there were not many marbles which would retain their colour in the open air; Irish green, verde antico, and magnesian reds and purples did. Green magnesian marble was not destroyed by the atmosphere of London, and it did not much harm the magnesian stones. He did not wish to be understood to say that one colour should be used, but only that they should keep as near to one colour as they could. Young men liked to use as many colours as they could, which resulted in a loss of breadth. Marble could never be got to go together on the ordinary pigment colour scale on account of the great variation in each piece, and they could not be tried in small pieces.

Correspondence.

LEPER WINDOWS.

To the Editor of THE BUILDERS' JOURNAL.

WALTHAMSTOW.

SIR,—From the note in a recent issue of your journal it would appear that Mr. St. John Hope has originated the Sanctus bell theory for the use of these much debated features in our English churches, but reference to the pages of "The Antiquary" will show that it was propounded and successfully substantiated by Mr. C. E. Ponting, F.S.A., a well-known authority on architectural archæology, in a series of letters (illustrated by drawings of typical low side windows), which appeared in that publication some ten years ago. But is not Mr. St. John Hope in error in saying that the bell could be rung *outside?* Many of the low side windows I have seen were provided with iron grilles, which would effectually prevent this, and in one case which I call to mind (Lyford, Berks) the opening is only 7½in. wide, and at the back of a deep splay, which would have the same effect.—Yours truly, H. M.

"GARDEN CITY:" MR. HOWARD'S REPLY.

GARDEN CITY ASSOCIATION,
11, NEW COURT, CAREY STREET, W.C.

SIR,—Permit me to write a few lines in reply to the letter of Mr. Strange in your last issue. The ground plan of "Garden City" as projected by me in "To-morrow," is really only suggestive; in some situations (as on the sea-coast) it would be quite unsuitable, in others quite impracticable. But it supplies, I think, a useful basis for discussion; and surely a careful consideration of the chief ends to be secured in wise city building is much needed. The opinions of architects are, therefore, of great value, and it is a hopeful sign when the president of the R.I.B.A. draws attention to the necessity of concerted yet individual design in street architecture (see p. 224 of your last issue). Mr. Strange is evidently possessed with the same idea, which you had forseen would certainly commend itself to the whole profession.

With Mr. Strange's letter before me it is with some hesitation that I confess that curved street lines have often appeared to me very beautiful. And those who are responsible for the widening of our main London thoroughfares seem to share the same feeling. For I observe that in connection with the new street from Holborn to the Strand it is proposed to strike a bold curve from east to west. That some inconvenience may be experienced in the case of crescents of a short radius may be quite true, especially if the houses are not detached; but Mr. Strange will, on reflection, probably admit that this difficulty entirely disappears when the circle, of which the curve is an arc, is a large one.

Again, it seems to me that "endless smoke, dirt, and smell" are by no means necessarily associated with factories and workshops. It is, indeed, extremely probable that in "Garden City," where everything would be up-to-date, and to which, therefore, public attention must be largely drawn, manufacturers would see it to be to their interest to erect beautiful airy buildings and to introduce (where furnaces were necessary) the most approved smoke-consuming apparatus. Indeed, the community would demand this, and that in its position of ground landlord. Mr. Strange's description of a beleagured garden city, as he sees it, would do justice to the most imaginative of our war artists; but, having disposed of the smoke—loud noise is not customary even now—its factories and workshops, far from being objects of reproach, might be extremely interesting—all the more so because Beauty and Utility would go hand in hand. Emerson asks a more pertinent question, and gives the the true reply:—"Is not the selfish and even cruel aspect which belongs to our great mechanical works—to mills, railways, and machinery—the effect of the mercenary impulses which these works obey? When science is learned in love and its powers are wielded by love, they will appear the supplements and continuations of the material creation."

The advantages which arise from placing the factories, &c., in the outer ring appear to me to be enormous. (1) In whichever direction the wind blows, the smoke from one half of the circle would pass right away from the town; and the more objectionable, or least unobjectionable factories, might be so placed that the prevailing wind would have that effect. (2) All the materials for manufacture, the products of manufacture, and the waste from manufacture could be dealt with without passing through the town. (3) All the factories &c., can be connected by railway, and thus the advantages of concentration secured without its usually attendant disadvantages. I do not think Mr. Strange has realised the perfect quiet which might pervade the residential parts of a city if all its main industries were thus carried on in the outskirts, or how near the people may be to their work and to their recreative spaces, while yet in close contact with the large outside world.

Mr. Strange is, I think, in error when he says that the expansion of a town must necessarily be from the centre outwards. This is certainly usual, but as certainly is not necessary; it is mainly the result of individualistic town-building, and is attended with the gravest inconveniences. The nucleus of a town is generally its places of manufacture, and these should certainly not be in central positions, when all the evils which Mr. Strange has spoken of in connection with them must pervade the whole town. A better, because a healthier, mode of growth, I believe, would be in concentric rings or arcs—the factories forming the outer ring, the homes of the people next, the parks and chief public buildings central—the whole surrounded by an agricultural domain, which should not be to any considerable extent encroached upon, further growth taking place by leaping over the surrounding agricultural estate—as explained by me in your issue of October 25th. (This method of growth is analogous to that known in zoology as gemmation, as "when a foraminifer, consisting of a little sphere of sarcode, develops a second one like the first, then a third one like the second, till quite a little group of these little globes has been formed, after which the whole are surrounded by a complex shell"—Nicholson.)

I confess I cannot share Mr. Strange's view that "in order that each house may get its maximum of sunlight, the streets should run as far as convenient in the direction of north and south." To push this idea far would involve, it seems to me, a long, narrow city—length without breadth. Nor is it at all necessary. I have seen very pretty effects produced by houses built with their fronts at right angles with the street, and in a city of ample space every home might, I fancy, be flooded with all attainable sunlight, irrespective of the direction in which the street ran, by a suitable but harmonious departure from street line.

It would greatly assist criticism, and lead to good constructive results, if Mr. Strange or other correspondents would do as I have done—draw a ground plan of a city which might be built on any fairly level stretch of ground; for the essential principles which should determine the relative positions of factories, shops, railways, houses, schools, &c., ought, I think, to be capable of clear statement, and thus the infinite variety which we all love to see in architecture, as in every other art, may be gathered up into a beautiful and noble harmony.—Yours faithfully,

EBENEZER HOWARD.

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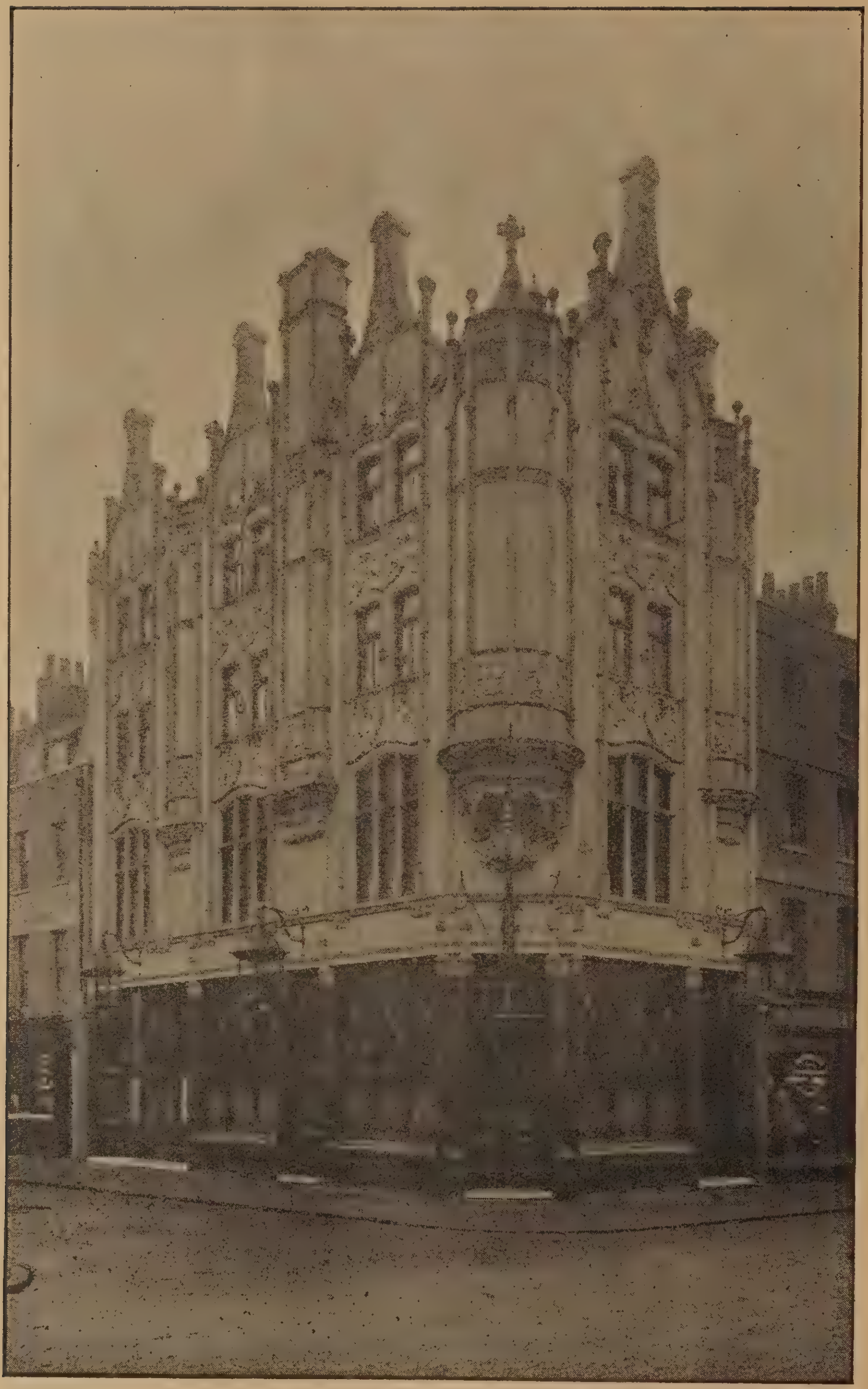

"THE RISING SUN," TOTTENHAM COURT ROAD, W. TREADWELL AND MARTIN, ARCHITECTS.

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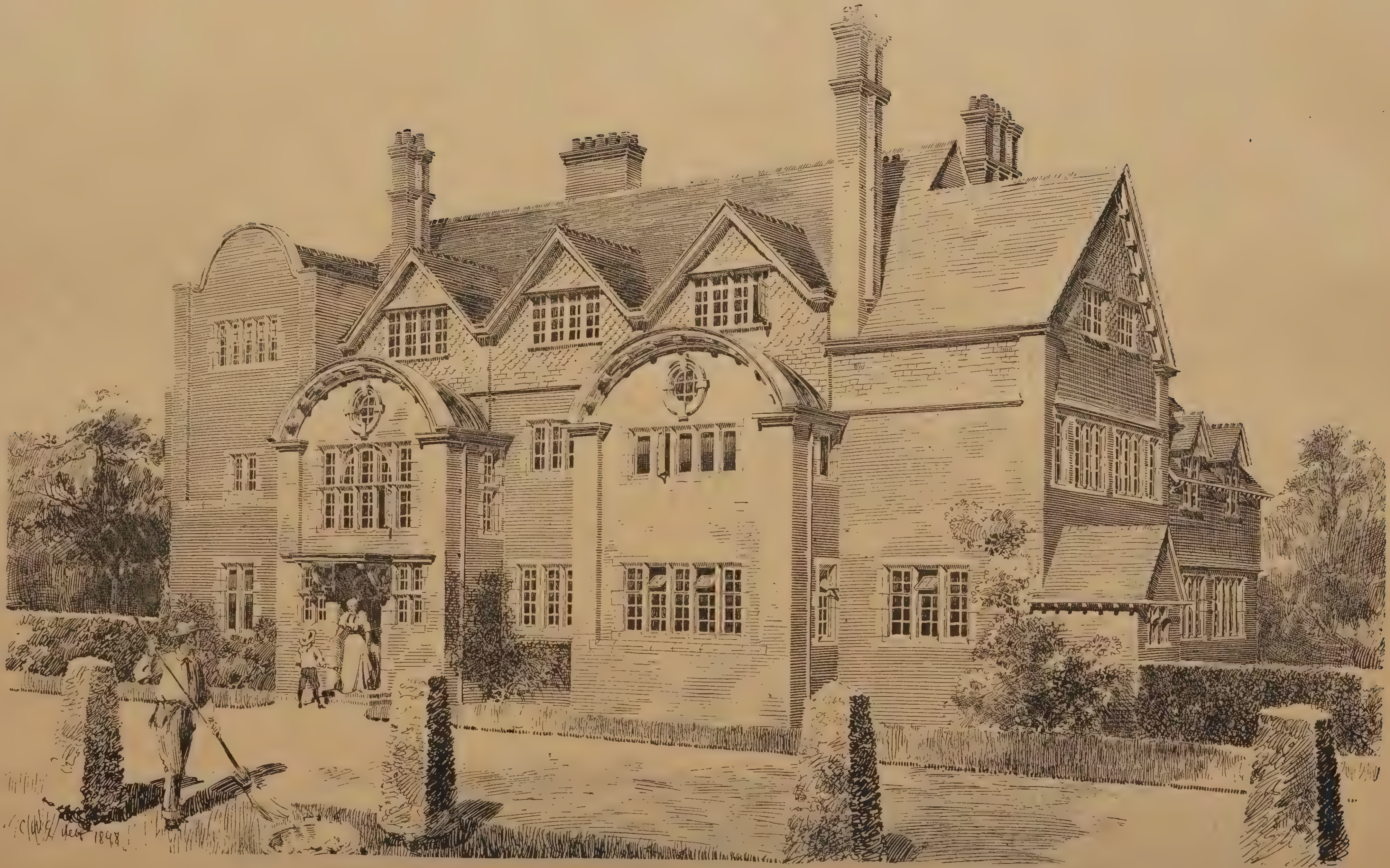

HOUSE AT BECKENHAM, FOR MR. W. A. BEWRY. Francis Hooper, F.R.I.B.A., Architect.

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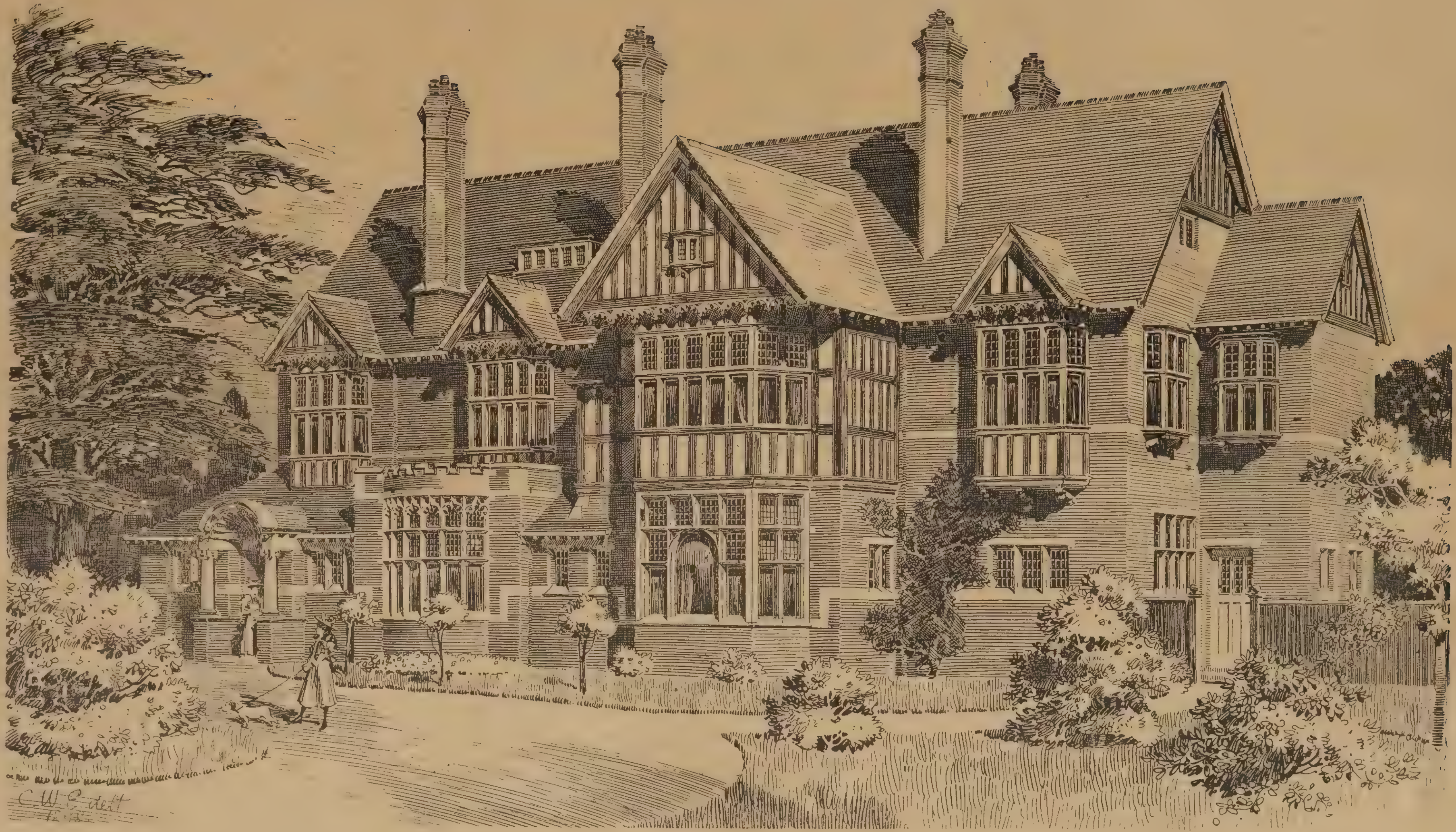

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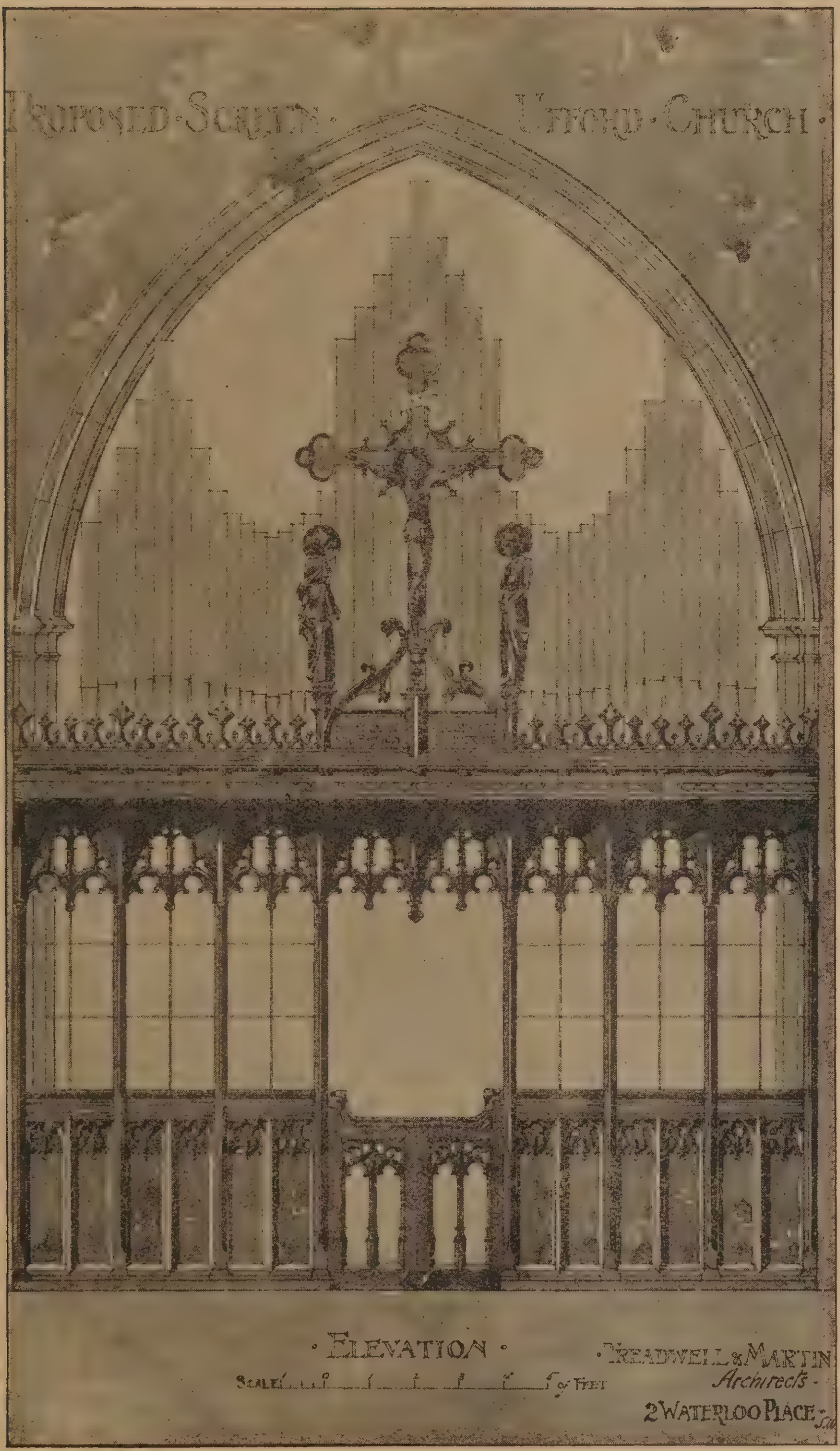

ROOD SCREEN, CHURCH OF ST. MARY THE VIRGIN, UFFORD, SUFFOLK. TREADWELL AND MARTIN, ARCHITECTS.

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R.I.B.A.

EXCAVATIONS IN CYPRUS IN 1896.

BY A. S. MURRAY, F.S.A.

THE second meeting of the session of the Royal Institute of British Architects was held on Monday evening, when the president, Mr. William Emerson, occupied the chair. After the minutes of the last meeting had been confirmed, Mr. Alexander Graham rose to express the regret of the Institute at the deaths of Sir Thomas N. Deane, of Dublin, and Mr. T. J. Flockton, of Sheffield. Among the many designs of the former was that for the library and museum at Oxford, which, besides being good architecture, was one of those great works that came under the influence of Ruskin's teaching. In conjunction with Mr. Woodward, Sir Thomas had competed for the Law Courts, and was also one of the competitors for the Imperial Institute. With regard to Mr. Flockton, he was the embodiment of Sheffield, for he had built half the city.

Dr. A. S. Murray, F.S.A., then gave his paper on "Excavations in Cyprus in 1896." The district where these have been carried out is best known to classical students from the extensive ruins of the Græco-Roman city of Salamis which lie along the seashore. It had been thought that the lower strata contained remains of a much older settlement, which would confirm the tradition that a band of Greeks returning from the war of Troy, under their leader Teucer, had settled there and built a city, naming it after their native island of Salamis. But no such remains were found. More inland, however, were several underground tombs, of construction peculiar to the Mycenæan age—such remains as might be expected of the original Greek colonists. As the settlers would have kept to the coast, the present inland situation of the remains was explained by the fact that an extensive tract of marshy land through which the river Pediæos flows, had once been a fine bay, at the head of which, on a rocky slope, the Greek Colony was established. Between this slope and the river, when Dr. Murray's party arrived, was a stretch of tilled fields worked by the people of a neighbouring village. On the face of the fields there was no sign whatever of ancient civilisation.

An Accidental Discovery.

An accident led to important discoveries. An ox in ploughing put its foot into a hole. At night the ploughman returned to the spot and found underneath a fine tomb of the Mycenæan period. The secret leaking out, Dr. Murray, who was just then starting for Cyprus, decided on further investigation, which resulted in the discovery of about 100 tombs, all of the Mycenæan age. This they claimed to be the burning ground of the original Greek settlers. Traces existed of previous rifling of the tombs in Roman and Mediæval days. Notwithstanding this, the objects in gold discovered almost equalled in quantity those obtained by Dr. Schliemann at Mycenæ, and were fully as important in quality, while the ivory carvings were of far greater value than his, and the pottery was more abundant and of greater interest. The author dated them at about 800 B.C., or even a century earlier. Numerous objects were found which had been imported directly from Egypt, others from Phœnicia exhibiting the mixture of Egyptian and Assyrian art for which the Phœnicians were famous, and others in which a purely Hellenic spirit was recognised, sometimes acting upon and modifying Oriental conceptions, at other times introducing entirely new conceptions as well as new technical resources. In the author's view this new

Hellenic Element

had reached Cyprus from the adjacent coast of Asia Minor, whence came the earliest Greek poetry, the earliest philosophy, the earliest painting. One of two reliefs on an ivory mirror handle represented a man slaying a gryphon—a familiar subject in Phœnician works, particularly among the antiquities found by Layard at Nineveh, dating about 800 B.C. The conception was obviously Assyrian in its origin, but there was also a breadth and style in the gryphon, and a keen sense of the creature's suffering which was finer in observation than anything known in Assyrian or Egyptian art. The other relief was a lion attacking a bull—again a frequent conception in Phœnician art. But in no case was the conception worked out in the ingenious manner here displayed. The artistic power and the just observation of animal life exhibited in these reliefs were premonitory of Greek genius. An ivory casket was another example. Its lid was divided into squares for the game of draughts on the same principle as an Egyptian draught-board; but the art of the reliefs on the sides was not Egyptian. It corresponded to what is known as Hittite art, the remains of which are found in Northern Asia and in Asia Minor. The prevailing element of the subject depicted was Assyrian, but on to that was engrafted a certain rude observation of actual men and animals, unlike anything Assyrian. The dawn of a true Greek artistic spirit was also exhibited in some porcelain drinking vessels. One or two were prototypes of similar Greek vases of the sixth century B.C. Among

The Bronzes Found

were a pair of finely-made greaves. As bronze greaves were not known in Homer's time, these antiquities were consequently later than the Homeric poems. A curious cubical bronze stand showing on each of its four sides the heads of two women looking out of a window seemed to be characteristically Palestinian, and might be taken as an illustration of the bronze stands or vases which Hiram made for King Solomon. On one part of the site were found bronze utensils, shovels, tongs, field implements, the pans of a balance, and some bronze vases which had been crushed together as if ready for melting. A heavy ingot of bronze, such as was exported for melting purposes, pointed to these being the remains of a foundry. In one tomb were examples of pottery belonging apparently to the most primitive age, side by side with the most developed stage of Mycenæan industry. These older shapes, the author concluded, had survived for the common purposes of daily life. The gold ornaments discovered consisted mostly of thin fillets or diadems on which designs were beaten out from moulds, the same mould being repeated over and over again on the same fillet. An Egyptian pectoral, inlaid with paste, of orange, blue, and white colour, and some

Gold Fibulæ

or perona, used by Greek women for fastening their dress on the shoulders, afforded additional evidence in support of the date the author assigned to the antiquities. A number of Egyptian scarabs were found, including one bearing the name of the Queen of Amenophis III. (c. 1450 B.C.), and another of the much later Orsokon dynasty of Egyptian kings, dating from the ninth dynasty. Discussing the presence of these two scarabs in a set of tombs which, from their general contents, could not have covered a period of much more than a century, the author contended that they could not both be contemporary with the kings whose names they bore. It was a matter of history that Amenophis III. became a Greek hero under the name of Memnon, and scarabs bearing his name were reproduced in comparatively late times for export among the Greeks. Turning to the decorative patterns painted on vases and beaten upon gold, these were interesting as carrying us back to the origins of

Industrial Art in Greece.

Nothing was more striking than to find representations of animal forms of the most extraordinary naturalism side by side with the most primitive exhibitions of decorative skill. There were illustrations of the cuttlefish, a favourite subject on pottery of the Mycenæan kind. To this day the cuttlefish is an article of food among the poorer people of Greece, and doubtless it was so in primitive times. Hence its being copied for decorative purposes. As, however, there was more of pattern than of naturalism in the form depicted, it was reasonable to suppose that a previous familiarity with spiral patterns evolved in technical processes had formed a basis of positive knowledge, from which those early designers advanced towards the more speculative copying from nature. Discussing the spiral pattern on the gold ornaments and pottery, the author showed the difference in the treatment of this pattern on the oldest, Dipylon, pottery of Athens, and that on the Mycenæan specimens. Spiral patterns from among the many sculptured stones of Scotland were shown as evidence of the community of artistic instinct between the people of the Mycenæan age and the Celts of Europe—a point now becoming generally recognised, but which the author had been well abused for suggesting at the time of Dr. Schliemann's discovery. As far as the excavations showed, the goldsmith seemed more at home in plant life than the vase-painter. The rosette and the palmette were equally common. In one instance there was a double palmette of striking resemblance to a pattern hitherto supposed characteristic of Greek vases of the sixth century B C. In another instance there was a complication of palmettes and spirals, almost suggesting a Corinthian capital. There were constant suggestions of the Ionic capital, but no sign of the Doric. There was an excellent example of a guilloche pattern incised on an ivory vase. From the curious and almost bizarre blending of art revealed by the relics, the author inferred that the whole series belonged to a period when the eastern Mediterranean was the scene of constant struggles for supremacy on sea among rival Greek or semi-Greek peoples. The results of the excavations, Dr. Murray added, will shortly be published by the British Museum in a book upon which he has been a good deal engaged since 1896.

THE DISCUSSION.

Mr. J. L. Myres congratulated Dr. Murray on the most important discoveries he had made in Cyprus, which, he pointed out, well filled the gap existing between the period of Mycenæan civilisation and that of the earliest stages of Hellenic civilisation. Dr. Murray had mentioned a number of features which indicated that the Mycenæan artists in Cyprus had already passed under the influence of Egyptian art. That is to say we were dealing at Enkomi with a somewhat late prolongation of the Mycenæan Age in the Levant. The great value of the Enkomi excavations was that they had produced a mass of first-class material for the study of that transitional art.

Professor Elsey Smith described the tombs he had seen at Paphos as being sunk in the earth, not of masonry, though some had doors composed of slabs of stone, and were approached by a flight of steps. After a few remarks by Mr. Hugh Stannus, Mr. Beresford Pite, and the chairman, a vote of thanks to the lecturer was carried unanimously. Dr. Murray briefly replied, and the meeting then terminated.

London County Council.—The proposal to construct a new tunnel under the Thames, to connect the districts of Rotherhithe and Shadwell (which would cost £2,500,000), was the chief matter discussed at the meeting of the Council held on November 14th. Eventually it was decided to go on with the work. The General Purposes Committee recommended that no action should be taken with the view to purchase No. 17, Fleet Street, commonly known as Wolsey's Palace, but an amendment to refer back was carried. The proposal to construct, in connection with the great Westminster scheme, a double line of tramways in Millbank Street, on the underground system of electric traction, was not carried, owing to the majority in favour of it being insufficient.

MODEL ANSWERS TO EXAMINATION QUESTIONS.

Answers to Questions set in the Examination held by the Society of Architects in April, 1899.

BY G. A. T. MIDDLETON AND R. W. CARDEN, ASSOCIATES R.I.B.A.

(Continued from page 196, No. CCXLVII.)

VII.—CONTRACTS.

1.—*Describe shortly the documents usually prepared for, and used in, a building contract.*

The documents included under a building contract consist of (*a*) drawings, general and detail, (*b*) specification, (*c*) general conditions, (*d*) contract form, and sometimes bill of quantities.

(*a*) The drawings are usually (1) a block plan, to a small scale, in order to show the position of the buildings, boundary walls, &c., upon the site; (2) elevations of all sides, plans of each floor (with roof and foundation plans in the best work) and two or more sections, these all drawn to a scale of 8ft. to 1in., and fully figured so that the contractor may have no opportunity for making mistakes; (3) detail drawings to a scale of 2ft. to 1in. with mouldings, &c., full size, so that the contractor may know exactly what he has undertaken to do. In practice it is unusual for *all* the details to be got out by the time of signing the contract; in this case a ½in. detail of part of the main front and of the roof, &c., would be prepared and included among the contract drawings.

(*b*) The specification may be considered as a report upon the drawings, with a description as to the method in which the building is to be erected and of what materials it is to consist. It is obvious that many things—for instance, "four coats of oil colour" and similar details—could not be in any way represented upon ⅛in. scale drawings, and these must perforce be embodied in the specification. The drawings and specification must agree in every way, and as much of the work as possible should be described in both classes of documents. It is still more important that what is omitted on the drawings should be found in the specification, and *vice versâ*. In the specification will be found:—The class and manufacture of bricks, lime, &c., for brickwork, with method of mixing mortars and concrete; laying of bricks, forming of arches, &c., and similar minute instructions for all trades.

(*c*) The general conditions should also agree in every particular with the drawings and specification. They include instructions with regard to:—Execution (to be according to drawings, &c.); commencement and completion; setting out and corrections; quality of materials and workmanship; variations, delays, maintenance; rate of payment; insurance; arbitration, and costs thereof, &c.

(*d*) The contract form is a legal agreement on the part of the contractor to execute the works in question, in accordance with *a*, *b*, and *c*, within a specified time and for a specified sum of money, known as the "consideration," which the employer agrees to pay. This form must be signed by both parties before witnesses, and stamped with a 6d. agreement stamp within fourteen days of its execution.

(*e*) The bill of quantities consists of a detailed statement of the amount of each material required for the erection of the building—as, for instance, "thirty-seven rods of reduced stock brickwork in mortar (as previously described) in footings, walls, &c.," or "200ft. cube fir framed in roof." The bill is prepared as a guide for the contractor on which he may base his estimate.

2.—(i.) *A certain amount of drainage works are included in some building operations which you are superintending as architect. You have been careful enough to insert a clause in the conditions to the effect that no trench is to be filled in by the contractor until the section of pipe in it has been tested. In spite of this precaution you find that at one of your periodical visits a certain section has been filled in before test, and without your orders. Discuss the case shortly: (a) from the legal point of view; (b) from the point of view of expediency.*

(ii.) *Rightly or wrongly, you do not insist upon the trench being reopened, but when the question of certificate for this portion of the work arises the contractor claims for 110 cubic yards of excavation, return fill and ram, &c. Would you certify for this amount? Length of drain between manholes, 60yds. Surface levels above ordnance datum at manholes respectively 150ft. and 151ft. 6in. Invert levels above ordnance datum at manholes respectively 144ft. and 145ft. 6in. Diameter pipe 6in. Pipes laid on P.C. concrete equal three times diameter in width. The trench is the normal width at the surface. (Note.—Calculations should be given.)*

(*ia.*) From the legal point of view the contractor has violated his contract in closing the trench, and the architect would be acting well within his rights—indeed, it would be his duty—to order the trench to be reopened in order that the drain might be examined and properly tested. Should the contractor refuse to open the trench, and neglect to do so within a given time after due notice has been served, the architect is at liberty to employ some other firm to open it, the cost to be borne by the contractor or deducted by the architect from the certificate.

(*ib.*) Under the head of expediency the question may be viewed in many lights. It may be a case in which the work must necessarily be pushed forward with the greatest urgency, and then the reopening, inspection, and closing of a trench would involve the loss of much valuable time. Under these circumstances there are a fresh set of conditions to be considered. The work may be of such a nature that it could be tested for alignment and fall by flashing with lamps from manhole to manhole; though, of course, the jointing and bedding of the pipes would not, by this means, be proved to be satisfactorily carried out. If, under these circumstances, the architect deemed it imprudent to have the trenches opened on the chance of the contractor having scamped his work, and when the whole work is ready to be tested, the water test should be applied in a very thorough manner, with as great a head of water as possible, and allowed to stand for twice the usual time. Should the drains not withstand the test, it would be imperative to have the suspected section opened up—provided, always, that the leakage was not obviously accounted for by some other defective point in the work. In another case the decision of the architect as to whether the trench shall or shall not be opened might depend entirely upon the known character of the contractor; for supposing the builder to be a man who has been employed for many years by the architect—let him be a man who, say, for twenty years, has carried out thousands of pounds' worth of work with the most immaculate rectitude—then it would seem that the architect has strong justification in allowing the work to pass as being correct, except that it is exceedingly improbable that a contractor of such integrity would commit a breach of contract, and fill in the trench before inspection, so that this case need hardly be considered.

Moral influence has also a bearing on the subject. If the contractor be disposed towards scamping his work, and if he begins to exhibit symptoms of rascality in the early stages of carrying out a contract by an act of such a description as that under discussion, and if the architect does not cause the trench to be opened, and thereby condones the offence, a precedent is established for the contractor, and the moral power of the architect becomes considerably lessened. Whereas if, on the other hand, the architect firmly takes up his stand by the contract and has the trench re-opened *nolens volens*, the contractor will speedily conclude that honest methods are the only ones to be employed in his dealings with *this* architect at all events. The next point of view to be considered merges into the second part of the question: that inasmuch as the architect has not viewed the trench he cannot be certain that the amount of excavation taken in the quantities has been duly performed. The amount claimed seems to be large, the excavation being 180ft. long, 6ft. 6in. deep (adding 6in. for the concrete), and 2ft. 6in. wide at the surface, and 1ft. 6in. at bottom, average 2ft. wide = 2340 cube feet, or 86⅔ yards "excavate and part return fill and ram." Now, if the architect has passed the trench without having it reopened, it may be taken for granted that he assumes the whole work to have been properly carried out, and therefore it follows that the contractor has a right to be paid for this amount, of 86⅔ yards, while there is no evidence, actual or presumptive, to warrant his claim for 110 yards.

3. *Shortly after you have succeeded to the business of another architect, a builder's account comes in for certificate for a work that is proceeding on a measurement contract. You check this account from your predecessor's measurement books, which appear to be duly initialled by the clerk of works and by the contractor's agent, as required by the conditions of contract, but you cannot make the quantities as regards some of the underground work, as claimed by the contractor, agree with the quantities as per measurement books. You make an appointment with the builder to talk the matter over, at which he promptly repudiates his agent's initials, on the ground that the person who initialled the books was not appointed by him for that purpose. Discuss the case shortly. (a) What would you do if you subsequently find among your predecessor's papers a letter from the builder appointing the man in question as his agent for the purpose of taking measurements in respect of the work in question? (b) What would you do if you cannot find such a letter?*

The solution of this difficulty is simple; for, even if the contractor denies having appointed the man who initialled the book, he clearly was bound by his contract to have appointed somebody to do so, and the neglect of this is to his own detriment. We should accordingly assume our predecessor's measurements to be in every way correct and should certify only for the amount they set forth. Every means should, of course, be taken to prove that the man was the contractor's agent, and if the man could be communicated with it would be a simple matter to ask him to produce any documentary evidence he may have. Failing proof of this kind, and if the difference between the measurements of the works to be paid for involves a large sum, it might be possible for an arrangement to be made with the contractor to the effect that the work should be opened up and measured again by agents of both parties to the contract, the party proved to be wrong bearing the cost of extra excavation and filling in to same. In case (*a*) there would be absolutely no doubt whatever as to the correctness of the books, and we should certify accordingly. The discussion of case (*b*) will be found above.

4. *Shortly after a client of yours has accepted, on your advice, the tender of a certain builder, you discover that both the builder and the client are rascals. (a) Explain, shortly, your general line of conduct towards each of them; (b) State, shortly, what precautions you would take for your own protection as regards your dealings with them.*

This question (which was voluntary) is scarcely answerable, so much depending upon events and circumstances as they arise. One can only suggest that the architect should rigidly hold the balance between the contractor-rascal on the one side and the building-owner-rascal on the other; that he should keep strict watch over the builder, and carefully supervise all materials and workmanship, give and receive all orders for extras, variations, &c., in writing, having them stamped even if considered necessary, and generally observe the utmost caution in dealing with both of the rogues.

THE GOTHIC REVIVAL.

By HALSEY RICARDO.

A LECTURE with this title, the third of a series in connection with the Arts and Crafts Exhibition Society, was delivered by Mr. Halsey Ricardo at the New Gallery, Regent Street, W., on Thursday evening last. He began by saying that in the history of building the idea of harking back, for reproduction, to some past time first occurred at the end of the fifteenth century, till then there had been no actual break in the process of growth. Unlike as mediæval work was to that of classic times, it followed the same principles, for it was entirely the outcome of natural conditions. The Romans in their need for aqueducts, baths, &c., invented new types of buildings, each specially adapted to its uses, and the same occurred during the twelfth, thirteenth, and fourteenth centuries in unbroken descent. It was true that there was a break in the architecture of the fourteenth century, due to the visitation of the Black Death, but the general line of growth was the same. The introduction of classic traditions under the revival of learning had at first but little noticeable effect on the old traditions, but its nature was not that of a growth or a graft, but parasitical.

Till then art was made for the people and shared by them, and all classes of men put hands to their work; those who had not the skill to execute or carve the actual work quarried or hauled the blocks of stone or did what manual labour they were fitted for, and though the cathedral was substantially the work of the Masons' Guild, all co-operated in the task of erecting the building, every affectation and self-consciousness being excluded.

The Renaissance was not popular; it was not universal art, it was not any man's art, but was the product of individuals. A band of amateurs and antiquaries formulated the definitions of "correct" art. The reins were now slackening in the hands of the Guilds, and while the craftsmen were learning the new language and the new technique the world lost interest in traditions it could not understand. The study of such philosophers as Plato and Aristotle showed that the Pagans were not ignorant, and their forms of art obtained sway with the educated classes, but for the people classic art had no gospel. Though the art was adopted by Popes and cardinals, when inquiring into the lives of these patrons it would be difficult to discover a more irreligious set of men. This art, while claiming so much polish, in opposition to the savage Gothic, was inhuman and unreal, and was the cloak for foul lust. To the people it became an inexplicable quantity, which only those who were rich enough could ever hope to enjoy. The Guilds of building and craftsmanship generally were taken over *en bloc* as a going concern, but under a new management. At first the masters were not consistent in their ideals, but under the guidance of the sculptor-architects progress was still made.

This new movement did not at once overwhelm the activity of the Guilds, but it checked them sorely; it was not for them now to make new discoveries, but to do as they were told. The responsibility of the action lay no longer with them, but with their directors. Gradually their vitality failed. For a time the fund of collected tradition of ages remained, and such architects as Inigo Jones and Sir Christopher Wren had it to draw from. The knowledge which contact with materials gives to the designer gradually faded away, and the designer became more and more an amateur.

In the attempt to get "pure" styles reproductions of original examples were made; these attempts to make a Palladian palace serve all purposes was an impossible task and the marvel was that so much in the shape of success was obtained. Still, there were places in the country where the old traditions have remained in the building of houses and cottages to the present day. The great outburst of church building, due to the Great Fire and Queen Anne's Bounty, produced buildings typical of the age, showing the great chasm that yawned between the populace and the nobility, and since the time of Wren, and his followers, the lamp of architecture has burnt more and more dimly.

But during the last years of the eighteenth century the people awoke from their apathy to the desire for more freedom, expressing itself in the reform of Parliament, the abolition of the slave trade, and other measures. The rights of man and the sympathy of man for man dated from this period. The laying of roads and making of canals in the country, and the use of steam increased the prosperity of the nation in the main, but the lot of the poor grew harder and harder and bread became dearer. The times were so out of joint that to many it seemed there was a risk of all existing institutions being done away with, and men looked to past ages to find a simpler and healthier state of things, and religious feeling spread far and wide. Enthusiasm now sprang up, and the outlook on life was changed.

In architecture Gothic was, at first, taken up as a sentimental fashion. A deeper feeling soon arose. The work of Welby Pugin is preserved because of its passionate sincerity and vitality. The fashion of the day, due to romantic literature affecting emotional but shallow natures, however, is shown in works, for instance, by Sir Jeffery Wyattville. The Classic Renaissance had recalled the work of past ages with some amount of success, and it was thought that there was no reason why architects should not have a greater success with Gothic. Gothic, however, was a living art based on the needs and conditions of the times; it was the outcome of truth, and was couched in a form which all could understand and enjoy.

At the time when Gothic was in development, Europe was aflame with religious zeal. The work of that time showed that the executants enjoyed doing it. The worker knew how to do honour to his design; you must appeal to a man's heart, to bid him use his dexterity as a means, not an end. The work is replete with human passions which we have all felt. The rich were not so far removed from the poor; and within the church portals all class distinctions between men were hushed. It was sincere, but its sincerity was rigid and could not adapt itself to the changes which were coming. The Reformation was at hand, and found England acquiescent. Cathedrals began to be raised by lay-builders, and not by church workmen. For a time things went on without disclosing much difference outwardly; the Guilds represented a wide and great fund to draw from, and it has taken three centuries to exhaust it. But the Gothic Renaissance found no fund of tradition as the early Renaissance had done; like a cone spinning on its apex, it had no stability. The attempt to clothe the present age with the garment of a past age was a revolution like that of an inverted cone, and nothing but the quick alterations of successive fashions could keep the cone balanced. To make up for the absence of tradition many books and specimens were taken from all countries, and the old buildings were restored or trimmed down to suit the ideas of the form most in vogue at the time. The fashion of building in the Gothic style took to such an extent that when the Houses of Parliament had to be rebuilt it was felt, nationally, that they should be built in this style. Buildings were erected as closely to known examples as the architects' employers would permit their needs to be squared into the requirements of a past age, Pugin arose, the most capable, learned, and sincere man of his time, but he was forced to rely wholly upon himself to get his work executed. He got his own workmen, and for a time there was a dream of tradition to help him, but even with this help the life in his work burnt dimly, and he had to live in the past. He had to persuade his employers that, besides Gothic being a national style, it was cheaper; and what man could do he did, but the task was superhuman. The power of his influence lay in his passion; the substance of what he had to say woke up men's minds. A great burst of church building sprang up, and with it a great burst of church restoration. The history of the building was disregarded, and conjectural attempts were made to show it as it stood originally. Whilst, therefore, new churches were being erected in the Gothic style, their models were being destroyed. The Revival swept away much that might have been preserved, and put in its place a forgery. This destruction roused opposition from the first from thoughtful archæologists, such as Carter and Emmett. Mr. J. T. Emmett had started work as a Gothic architect, but gave it up as impossible to gain its ideal. From independent sources, however, a voice loud and clear arose, and it rang with such burning eloquence that those who were its enemies could scarcely shut their ears close enough to escape its message. It based itself on high authority, and spoke as one who knew, as one who had the cause of Right only to advocate, as one from whom all personal element was eliminated. England has never been the same since that voice arose, and men were drawn in by its influence. Mr. Ricardo here read an extract from Ruskin's letter to Sir Henry Acland, written on January 20th, 1859, with reference to the Oxford Museum, which was to be an ideal building and the hope of architecture. In this letter Ruskin pointed out clearly that it was not right to suppose that after lying dead for two centuries the system of Gothic building could be successfully revived at a first trial, nor to suppose that present-day workmen could be quickly produced on a level with those who inherited the instinct of their craft through many generations. A return to quieter and simple art, said the lecturer, was indeed necessary if we were to found an architecture of our own—which we *must*, for building must ever go on. To-day the architect rushed over continents with his sketch book, and returned from his travels with fresh troubles for the workmen.

In looking at the work of G. E. Street, the lectures could not help thinking that his pen was somewhat his enemy. He had built grand houses, and, though dwelling for the most part—unconsciously in fairyland, his work showed a desire to be actual and commonsense; but his capable hand could not supply all that was asked of it, and in its impetuous production carried its owner beyond the land of actuality into fiction. William Burges also dwelt in fairyland—he wrote "Ivanhoe" and "The Talisman" in stone—his work was full of fun and reflected the happy side of life; of the deeper passions of humanity his work shows little trace.

The only other man named by the lecturer was Mr. Butterfield, to whom he ascribed qualities that would make his work endure. His attitude was frank loyalty to fact; he had studied as widely as Pugin, and with a patience far deeper; no haste mars his work. When he built a church he did not build it for a past age, but studied modern requirements. He was always sincere, and this sincerity separates his works from those of other men. In all that he did, one is conscious of a reserve power, which some erroneously call austerity. In much of his work, though the effect is supreme, the means would seem strangely inadequate. Life is not a trifling matter, and only those who assert it on these terms can expect to get anything good out of it. Butterfield had a message to deliver, and his buildings show this message; but he accepted no help from the craftsman, and it is his individuality alone which preserves his work.

Art, whether good or bad, is man's language to his brother man. It may be real or sham, and it is our business to reject the sham. This is not always a simple matter to determine, but sincerity is a quality hard to assume. The whole of past architecture is open for us to study and as an example. The Gothic Revival for the most part was an attempt to study it from the top downwards and not from the bottom upwards.

At the Church of Chalfont St. Giles, Bucks, a costly set of oak choir stalls have been provided, seated angels being placed at the ends instead of "poppy-heads." Milton's cottage is at Chalfont St. Giles.

Bricks and Mortar.

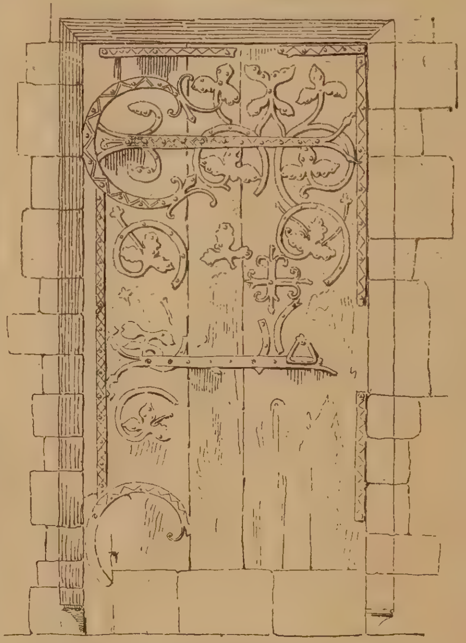
Aphorism for the Week.

> *"In the older days of Art*
> *Builders wrought with greatest care*
> *Each minute and unseen part;*
> *For the Gods are everywhere."*
>
> —Longfellow.

Our Centre Plates. The house at Beckenham for Mr. R. Murray Hyslop has recently been completed on the Kelsey Manor Estate by Messrs. H. Copeland and Son, contractors, Beckenham, Kent. The stonework was executed by Messrs. Champ, of Penge; the heating by Messrs. Killick and Cochran, of Liverpool; the iron casements by Messrs. Pearse, of Kennington Lane; the enriched ceilings by the Veronese Co., Norfolk Street, Strand; the electric wiring by Messrs. Clarke, of Sloane Street; the mosaic floors by Messrs. B. Ward, of Westminster; the lavatories, etc., by Messrs. Jennings, of Lambeth; the grates by Messrs. Bratt Colbran, of Mortimer Street, W.; the leaded glazing by Messrs. Plarse and Messrs. Simpson, of St. Martin's Lane. The grounds were laid out under the direction of Mr. H. E. Milner, of Westminster. Mr. Beney's house at Beckenham is also on the Kelsey Manor Estate. The view is taken from the north-east corner. The general contractors are Messrs. H. Copeland and Son, by whom the work is being carefully carried out. The stone work is being done by Messrs. Champ, of Penge; the heating and hot water engineering by Messrs. Killick and Cochran, of Liverpool; the electric wiring by Messrs. Peacock, of Clerkenwell, E.C.; the coal and luggage lift by Messrs. Smith and Stevens; the iron casements by Messrs. Crittall, of Braintree; and the laying out of the ground is in the hands of Mr. H. E. Milner, of Westminster. The architect of both houses is Mr. Francis Hooper, F.R.I.B.A., of Norfolk Street, Strand, W.C.

A Famous London Square. Kensington Square is a place of great associations. The names of Pope, Addison, Macaulay, and Thackeray are connected with what was perhaps the first-built house there—the old Greyhound; but this is now replaced with a building of red and yellow brick, with stone dressings. At the corner opposite, says a writer in the "Daily Telegraph," is the house in which Thackeray, in "Esmond," lodged Lord Castlewood, and in which he made the Pretender hide; it was in the cottage belonging to the house (now No. 16, Young Street) that the great writer produced that immortal work, "Vanity Fair." At another house in the square Talleyrand resided in his exile, while the late Nassau Senior, the famous political economist, came to live at No. 32 early in the century. One of his neighbours was James Mill (the father of John Stuart Mill), while close at hand lived John Richard Green, the historian. The names of the Duchesse de Mazarine and the Earl of Shrewsbury are also connected with Kensington Square. The Duchess was one of Charles the Second's favourites, who bestowed on her a pension of £6,000 a year. Kensington was right out in the country at the end of the seventeenth century, when William III. bought Nottingham House and transformed it into Kensington Palace. For many people there is a nameless and indefinable charm about the domestic architecture of this period. The unpretentious character of the design, the unobtrusive decoration, severe and simple, the varying sky-line, the trim little forecourts, with wrought iron gates opposite, chastely moulded doorways, the effectiveness of the warm red-brick dressings gleaming out of the mass of brown stock, crowned by a roof of red tiles or green-tinted slates; all combine to produce an effect of well-ordered comfort and homelike simplicity that is not found to the same degree in any other order of domestic architecture. Those who remember Kensington Square before the improver began his handiwork, will remember it as a place that seemed to be pre-eminently the home of quiet respectability and leisurely independence.

Eastwood Church, Essex. Eastwood Church, near Rochford, is an interesting little village church, and was restored in a judicious manner a few years ago by Mr. William White, F.S.A. The illustration on this page, showing the ironwork on a door on the north side of the church, is taken from a measured drawing by Mr. John Hebb, F.R.I.B.A. The ironwork appears to be of two different dates. Mr. J. Starkie Gardner, in his useful little manual on "Ironwork from the Earliest Times to the Eve of the Mediæval Period," one of the South Kensington Museum Art Handbooks published by the Committee of Council on Education, gives an illustration of the ironwork on a door on the south side of this church (p. 54). In referring to these two doors, Mr. Starkie Gardner remarks:—"In one we have crescent hinges without a central strap, ending in scrolls, and diapered in the manner of the earliest examples, faced by corresponding detached crescents, with fish-shaped straps between them. These and other straps, as well as the binding to the door, are frilled with scrolls as at Willingale (Spain, near Ongar). The second door [that figured in our illustration] is similar, but the binding has no frilling. As in the case of Leicester and St. Albans, there are fourteenth century additions to the latter, this time in the form of a scroll design with vine leaves cut out of sheet iron and nailed to the door. The crescent hinges with detached straps on the door in the north aisle of Canterbury Cathedral are very similar in fashion to those at Eastwood, and were probably utilised from an older doorway." The hinge of the door on the south side of Eastwood Church has an inscription in Gothic characters which is now nearly obliterated; the inscription is in Wright's "Essex," II., 600, where the following description of Eastwood parish occurs:—"This parish is said to be named from its situation eastward from the woods and parks of Rayleigh and Thundersley. In Edward the Confessor's time the manor belonged to the father of Suene, Earl of Essex, to the latter of whom it was granted by the Conqueror at the time of the survey. It is in length nearly four miles and in breadth one; the village is distant from Rochford two, and from London forty miles. . . . . On one of the door-hinges of the neat little church in this village there is the following inscription in very curious old characters:—'Pax regat intrantes, eadem regat egridientes.'"



EASTWOOD CHURCH, ESSEX: SOUTH PORCH.
DRAWN BY JOHN HEBB, F.R.I.B.A.

Street Lighting. The results of an inquiry made by the proprietors of "The Municipal Journal" into the Welsbach incandescent system for street lighting, come, they say, as a surprise, and the most surprising thing they found was that municipalities with their own electricity works were adopting the newer gas system for the lighting of their streets. From a pamphlet, which bears the rather exaggerated title, "Revolution in Public Lighting," and contains a reprint of articles that have appeared in "The Municipal Journal," we take a few extracts:—"The old drawback to incandescent lighting for public thoroughfares, which arose from the effect of wind and vibration on the mantles, has been overcome. Improvements have been made with the mantle of such a nature that, given a proper lantern, all trouble ceases. The lamps can be made to stand the test of the wind of a sea storm, as they do at Ramsgate, or the vibration of traffic in crowded streets, as they do at Liverpool. One thing seems to be clearly established by our inquiry, and that is that incandescent lighting is of very little use in the old lanterns." Despite the pages of tables comparing the experience of corporate towns with incandescent and ordinary gas lamps, and despite the eulogy of the Welsbach system, we do not think that this will be the "conquering competitor" of the electric light, for though the latter generally proves to be the dearer system it is free from many faults common to all forms of lighting by gas, and offers more possibilities for producing an ideal light—especially for streets.

The Helen Faucit Memorial. The inhabitants of Stratford-on-Avon who were present at last week's meeting at the Town Hall exhibited a strange lack of appreciation of a generous offer. Sir Theodore Martin, K.C.B., has offered to present to the parish church a new pulpit in memory of his late wife (Helen Faucit), an addition which is to cost £1,000. As there seemed to be a great difference of opinion as to the best and most suitable position for the pulpit, this meeting was held to consider the question and inform Sir Theodore of the wishes of the people on the subject. Sir Arthur Hodgson said that for a mere matter of 14ft.—the distance between the two suggested sites—the offer had been half rejected, and, after some discussion, he suggested that the site of the pulpit should be left entirely to the donor and to the architect (Mr. Bodley). The people would, however, have none of this, and unanimously voted for their own plans. To say the least, this was hardly courteous.

Arts and Crafts. Every movement has its adherents and its opponents, its zealous advocates and its sincere, captious, or cynical critics, and the Arts and Crafts movement is no exception to the general rule. The "Daily Chronicle" has recently been expressing its opinions on the subject, and says that, though the exhibition is an interesting one, carefully arranged by a body of earnest men who evidently have their subject very much at heart, it very much doubts that the exhibition has any real influence on national art. The writer deplores that, since the introduction of machinery, the work of to-day is devoid of that sign-manual which the old workers put on their productions, and that it has no spontaneous feeling of the people. "Therefore," he says, "it is nonsense for the critics of arts and crafts exhibitions to talk as though the movements such exhibitions represent in concrete form were going to effect a revival that can only be effected through a change of economic conditions. . . . . Each Arts and Crafts Exhibition makes the fact more clear that the English revival of artistic handicraft exists only among the *précieux*, and that their taste is administered to not by the industrial classes, but by dilettanti." With so many contending voices around him, where is the workman to find a basis? If one side affirms this view as the correct one, and this ideal as the true one, and the other side denies them, it makes it indeed hard for the honest, intelligent worker to decide which is the right path to take; and it must be remembered that it is in him that the revivalists centre their hope in attempting to elevate the craftsman and his craft.

FULHAM PUBLIC BATHS COMPETITION.

THE drawings submitted in this competition were on view to the public at the Town Hall, Fulham, during last week. They consist of some twenty-nine designs shown upon upwards of eighty drawings. The site for the baths and washhouses is at Melmoth Place, Walham Green, and its area is about 51,978 square feet, being a narrow strip of land between Melmoth Place and Hartismere Road, the former being the more important thoroughfare. The sides of the site are bounded by buildings and back gardens, a private road entrance only being retained from Hartismere Road. It will thus be seen that the competition was one in which the architectural treatment of the exterior was confined to the Melmoth Place frontage, and as in many designs, including the first premiated, this frontage is given up (with the exception of a narrow width retained for entrances) for commercial purposes of shops, the competition becomes one of planning pure and simple. Many of the competitors have recognised this commercial aspect of the scheme; others, unfortunately with good plans in many instances, have stultified themselves by bringing the baths to the Melmoth Place frontage, the treatment of which they have included in the scheme.

In the first premiated design by Mr. H. Dighton Pearson, A.R.I B.A., 8, Arvin's Road, Teddington, space is left at either side of the entrances from Melmoth Place for shops, the centre block containing superintendent's office, pay box and refreshment room with entrances for either sex, on the first floor the board room, &c., and superintendent's house on the floors over. The author covers the entire site on the ground floor with the exception above mentioned, the entrances to the various apartments are well arranged, and the men's corridors to the first and second-class swimming baths are separately entered from the hall.

The ladies' swimming bath is placed behind their slipper baths nearest Melmoth Place, the men's first-class swimming and slipper baths adjoin and are entered by a separate corridor from the hall, whilst the men's second class swimming and slipper baths are entered from a separate corridor along the left-hand boundary of the site. A gallery runs round the first-class swimming bath and is entered from the corridor, with an exit at the opposite end into the second-class corridor. Club and performer's rooms are placed between the two men's swimming baths. The laundries are well placed. The establishment laundry is entered at the end of the second-class men's corridor and communicates with the public ironing room by a pass door. The public laundry is entered from Hartismere Road; the plan of this department is particularly well worked out in respect of convenient practical working. The whole of the building is top lighted with the exception of the sanitary accommodation, which is arranged round lighting areas. In the basement is placed the boiler house, with coals in a good position, and subways for service pipes to swimming and slipper baths.

The second premiated design is by Mr. Henry Drury, Craigleith, Kersfield Road, Putney Hill. Unlike the selected design, the author has provided a lighting area along the right hand side of site; separate entrances are provided for men and women from Melmoth Place. The corridors, however, are not so direct, a single corridor giving access to men's first and second-class swimming baths. The staircase to the gallery which surrounds the first-class bath is entered from this corridor. The public washhouse is placed at the Hartismere Road end of the site; the establishment laundry, however, is located in the basement and does not appear very accessible for soiled linen. The board room, as in the first selected design, is placed on the first floor, over the ticket office, which, however, is not quite so well arranged, and the author has omitted to give any communication for the staff between the public baths and washhouses on the ground floor. The elevation is treated with a gable and bay window to board room, but the second-class women's slipper baths coming to the front leave a gap in the street elevation which is commercially extravagant. The drawings are neat and carefully prepared.

The third premiated design, shown on four strainers, numbers 47 to 50, are by Mr. T. W. Aldwinckle, 1, Victoria Street, Westminster. The author of this design leaves space for two residential shops and two lock-up shops in Melmoth Place, the board room and superintendent's quarters being built over the latter, and the entrances in the centre. The ladies' swimming bath is brought nearer the front, and the slipper baths are placed at the side and beyond, the men's slipper baths being between the same and the first-class swimming bath. The plan is simple, with a long corridor down the side of the site to the public washhouse at the back, the establishment laundry being placed between this and the second-class swimming bath. In this instance, also, the author leaves an area at the side of the site for purposes of light, into which an emergency exit from the gallery surrounding the men's second-class bath delivers. The details of the scheme appear well worked out on the good set of drawings submitted.

Design No. 40-41 shows the front portion of the building as a detached block, with entrance roads on either side, which gives access to a court behind, from which are entered the ladies' baths. The right hand side of the site is treated as an open space, from which entrances are provided to the various departments—a scheme which does not commend itself on account of the expense of administration. No. 42-44 brings the women's baths to the front, with a central corridor to the men's baths, the slipper baths being on the left, the second-class swimming bath being on the right, and the first-class at the end of the corridor. The establishment laundry is not well placed, and the staff inter-communication is defective; the elevations are not well grouped. 45-46, with a better elevation, is needlessly extravagant in corridors, which are continued from back to front of site, for both sexes. 51-54 shows the public laundry in the middle of the site, entered from Melmoth Place, while the plan also has other defects. The elevations are designed in a quiet, unostentatious manner. 59-61 has a good elevation, but a poor plan. 63-65 recesses the centre of Melmoth Place front, the wings of which are given up for commercial purposes. 66-67 brings the refreshment room to the front, while 68-70, with a good plan, sets the whole building back from the frontage with a quadrangle, thus utilising the whole of Melmoth Place for commercial purposes. 71-74 occupies the whole frontage for the baths, with the exception of five lock-up shops on the ground floor. The slipper baths are well arranged, but the author has provided an entrance to the second-class swimming bath from Hartismere Road.

No. 75 has a bad plan, with the public washhouse on Melmoth Place. 76-78 gives up the entire Melmoth Place frontage for the baths, but separate first and second-class men's corridors. 1 and 2 groups the slipper baths, in the centre of the site, with the ladies' swimming bath, the men's first-class bath being at the Melmoth Place end, and the second-class adjoining the public wash-house at the Hartismere Road end; space is left for shops on one side. 3-7, with a very laboured set of drawings, has a poor plan. 8-9 also has an internal courtyard behind proposed shops, the slipper baths are grouped at the Melmoth Place end, then the ladies' swimming bath, first-class men's swimming bath, second-class men's swimming bath, the public laundry being at the Hartismere Road end, while space is left at the side for future extension. The establishment laundry, however, is placed in the basement. 10-12 has a good plan, with separate corridors and well arranged slipper baths; although this is certainly one of the best schemes submitted, the elevation is very poor. 13-15 is not so economical in arrangement as the last, but it has good points. The building, however, is brought forward to the Melmoth Place front. 16-17, with a plan of good points, adopts the separate corridor system for each class from the entrance hall, which is, however, too cramped for the purpose, and the refreshment room is badly placed for such an arrangement. The elevations are commercial. 20-22 also gives first and second-class men's corridors, the latter being continued through to the Hartismere Road entrance. 23-24 has made the laundry a separate detached building, except by a communicating passage in the basement, otherwise the plan has good points, although not arranged on commercial lines; the Melmoth Road elevation is characteristic of the author. 25-26 has one of the best elevations but a poor plan, while 27-28 occupies the whole of Melmoth Place frontage for the baths, with a courtyard, otherwise the plan has some good features. 29-30 is painstaking, and provides separate accommodation for "sweeps and dirty boys," but in other respects the plan is one of the poorest. 31-33 with a good plan fails in giving the commercial value to Melmoth Place frontage, while 37-39 is extravagant and defective in plan, although the commercial spirit is recognised in Melmoth Place front.

The cost of the scheme is between £30,000 and £40,000, and although fully recognising the merits of many of the plans submitted, we think Mr. Baggallay, the assessor, has selected the plan which most nearly meets the various circumstances of the case.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

CONSTRUCTION EXAMINATION.

London, W.—F. G. C. writes:—"Having noticed in your columns the question as to what would be the best books for Building Construction Honours, Part II., it has occurred to me that it might prove of interest to state to you that I, having obtained one of the only two medals awarded in Part II. of the Honours this year, studied the subject wholly from Mitchell's Advanced and Honours Building Construction. I may also add that my colleague who obtained the other medal used the same work in his studies."

R.E. SURVEYOR, CIVIL STAFF.

G. R. writes:—"Would you kindly let me know what would be the best books to use in working up for the exam. of Assistant Surveyor Royal Engineer Civil Staff?"

The books to work up for this examination are "Notes in Building Construction," Vols. 1 to 4; Seddon's "Builders' Work"; Wray's "Theory of Constructions"; Col. Moore's "Sanitary Engineering"; Leaning's "Quantities"; Leanings "Set of Contract Documents"; and especially the War Office Schedules, namely, "Schedules of Contract for Works and Repairs to Buildings of the War Department in the Ordnance Factories and Manufacturing Districts" (Harrison and Sons, St. Martins Lane, 16s. 9d.).

HENRY ADAMS.

BUILDING CONSTRUCTION HONOURS STAGE.

J. F. writes:—"Which are the best books to study for the Honours Stage in Building Construction; also, where can I obtain copies of papers set at various examinations?"

Supposing that the candidate has already passed first-class in the advanced stage, he should study Vols. 3 and 4 of "Notes in Building Construction" (Longmans, 21s. and 18s.), and "Modern Architecture" (Crosby Lockwood, 6s.) As an introduction to Vol 4 of the notes, he may read "Adams' Strains in Ironwork" (Spon, 5s.). Copies of previous examination papers may be obtained at South Kensington Museum; or through Messrs. Chapman and Hall, 11, Henrietta Street, Covent Garden, London, W.C.

HENRY ADAMS.

PREVENTING CONDENSATION.

Kirkcaldy.—Des writes :—"I have a large linen factory to erect, with weaving shed roofs, the boarding of which is to be exposed and painted inside similar to others in the locality. Unfortunately, in the existing roofs the condensation drops and causes serious damage and annoyance. I should be glad to know of a remedy for this. Would powdered cork dusted on the wet paint do, similar to that used in steamships? The Factory Act demands that these roofs shall be painted periodically, and if so, would not the subsequent painting spoil the absorptive quality of the cork dust? Perhaps you can suggest some other remedy, but the roof *must* be boarded."

Condensation occurs when heated air comes in contact with a colder body, and more freely when the colder body in non-absorptive. If the roof *must* be boarded, and the boarding must be painted—that is oil painted—it is difficult to suggest anything that will be a complete cure. Cork dust sprinkled upon the newly applied paint would certainly prove a remedy for the time being, but if the boarding has to be periodically repainted the cork dust, by its absorption of paint, would not only be rendered inoperative as an absorbent of moisture, but would also seriously increase the cost of the painting. Something might be done by interposing a bad conductor between the boarding and the outer air, and a 2in. layer of silicate cotton might materially assist in overcoming the trouble; but if the terms "paint" may be construed as sufficiently elastic to include distemper (tempra paint), washable or ordinary, the replacement of a shiny, impervious surface by a dull absorbent one wonld probably effect a cure. H. E.

RIGHTS OF LIGHT AND AIR.

Newcastle.—P. and B. write :—"A built a wash-house right up against B's kitchen window, and its chimney is below the sill of the bedroom window (first floor). B's house has been built about twenty-five years. What remedy has B, who has not consented to it? Can he knock it down or take action for damages."

If B has had the uninterrupted enjoyment of light through his kitchen window over A's premises for twenty-five years, he has acquired a right of light under the Prescription Act, 1832, and he might obtain a mandatory injunction to compel A to remove the obstruction from the kitchen window. It does not appear that any prescriptive right has been infringed in respect of B's bedroom window. There is no prescriptive right to air over A's premises generally; but the smoke from A's chimney might possibly amount to a nuisance. Certainly B would have no right to knock the chimney down. G. H. B.

CIVIL SERVICE APPOINTMENTS.

Shipton.—Anxious writes :—"Will you please state the difference between civil engineers and assistant surveyors in the Civil Service."

The difference in the work of civil engineers and assistant surveyors in the Civil Service is very marked, but the difference between the respective examinations is not so wide. For assistant civil engineer, H.M. Admiralty, the examination is in the following subjects :—Handwriting and spelling, algebra (including quadratic equations), practical geometry (plane and solid), plane trigonometry, graphic statics, chemistry and mineralogy, heat, electricity and magnetism, hydrostatics, hydrodynamics and hydraulics, levelling and surveying (including the use and adjustment of the theodolite and level), preparing bills of quantities, estimates, specifications and professional practice, general building construction (including the strength, uses and properties of building materials, building plant, shoring and scaffolding, calculations of strains in arches, beams and framed structures), sanitary engineering, drawing and design of engineering works (including the construction of railways, roads, harbours, docks, bridges, and breakwaters), architectural drawing (including design and ornament). For assistant surveyor, Royal Engineer Civil Staff, the examination will consist of two parts, and will be in the following subjects, viz :—Part I. Preliminary. Handwriting and orthography, English composition (as tested by writing letters from rough notes), arithmetic (including vulgar and decimal fractions). Part II. Competitive. One of the following at the option of the candidate :—(*a*) architectural drawing, (*b*) engineering drawing, (*c*) preparation of working drawings for details of builders' work. Theory of construction, strength and quality of materials, and description of workmanship, tools and plant. Analysis of prices, measurement and estimate of builder's work, including taking off quantities from drawings and preparing the abstracts and bills of quantities. Sanitary engineering. In addition to the above six subjects a candidate may take up any of the following optional subjects :—Euclid (the first three books), algebra, including quadratic equations, plane trigonometry, geometrical drawing and freehand sketches in outline; chemistry and mineralogy relating to building materials. For second-class assistant surveyor in the Office of Her Majesty's Works, the examination is in the following subjects :—Part I. Preliminary. Handwriting, orthography, arithmetic (including vulgar and decimal fractions). Part II. Competitive. Drawing and design of architectural works, details of construction in foundations, masonry, brickwork, carpentry, ironwork, joinery, plumbers' and sanitary work; rudimentary calculations of strength and applications of materials of construction; measurement of quantities in building works and estimates of cost; specifications for building works; sanitary engineering; practical geometry; algebra, including quadratic equations; rudimentary mechanics; use of surveying instruments; any one modern language. For assistant surveyor in the department of the Director of Engineering and Architectural Works, Admiralty, the examination is in the following subjects :—English composition (so far as regards the ability to write a good letter); mensuration; constructive and working drawings; book-keeping; practical measuring (oral); bills of quantities for, and measurement of artificer's work, and its valuation; composition and properties of building materials; land surveying and levelling, and the elements of trigonometry; algebra, including quadratic equations. The grouping of the subjects may vary in future examinations, but the scope remains about the same. Prospective candidates should watch the advertisement columns of the professional papers and apply to the secretary of the Civil Service Commission for particulars as soon as any examination is announced.

HENRY ADAMS.

Institution of Civil Engineers.—At the meeting held on November 14th Mr. H. H. Dalrymple-Hay, M.I.C.E., read a paper on the construction and equipment of the Waterloo and City Railway, which is one and a half miles long, and consists of two iron tunnels of about 12ft. 6in. diameter. Mr. Bernard M. Jenkin, A.M.I.C.E., described the electrical equipment of the line, the second underground railway that has been built to be worked electrically.

The Arts and Crafts Movement.—In reference to the report of his lecture published in our issue for November 8th, Mr. Walter Crane writes to us as follows :—"The mention of the influence of Scott's writings was rather with the view of showing certain tendencies *favourable* to the later Morrisean revival in art and literature, not as antithetic thereto. Again, there is an obvious mistake in the mention of the Royal Academy, the foundation of which dates from the last century chiefly as a guild of painters. The Arts and Crafts Exhibition Movement, as I stated, really had its origin in the agitation of 1886 for a national exhibition of all the arts, but which petered out in proposals for the mere reform of the Royal Academy, on which the Arts and Crafts men in that movement decided to form their independent society."

Professional Practice.

Bristol.—The Jubilee Convalescent Home which Her Majesty the Queen opened last Wednesday is not a new building, but a boys' boarding school (known as "Waynflete") adapted for its new requirements. The Home stands in its own grounds of about three acres on the border of Durdham Down, and the necessary alterations have been carried out under the supervision of the honorary architect, Mr. W. L. Bernard, who originally designed the building. The only external alteration required was the provision of an entrance on the front or north side, the floor of which is in mosaic. The Home comprises basement, ground floor, and two storeys above, and accommodation is provided for eighty patients. On each floor a long corridor runs from one end of the premises to the other, and into these the whole of the various departments open. The first floor is approached by three sets of stairs, and opening on to the long corridor are dormitories, servants' rooms, nurses' rooms, lavatories and bathrooms, and the chapel, the latter being a handsome apartment, with carved oak panels fitted into the walls. On the second floor are bathrooms. The whole of the plastering was entrusted to the Adamant Co., of Birmingham, who have used their Birmingham waterproof cement for the dados of all the bathrooms and lavatories. Steam heating, with improved radiators, has been installed by Messrs. John Williams and Sons, Queen Street, Cardiff, and the regulators are completely under control in each ward or room. Laundry arrangements are also by the same firm. A fine turret clock has been given to the building by Messrs. Kemp Bros., of Union Street, and many tradesmen have contributed to the equipment of the establishment. It may be mentioned that the doors of the building were thrown open by the Queen touching a jewelled electric button concealed in a solid gold paper weight 5in. long. Since Her Majesty last visited Bristol in 1830, the city has grown from 755 acres to 13,568 acres, its population from 59,000 to 320,000, and its rateable value from less than £200,000 to considerably more than £1,500,000.

Nottingham.—The new Nottingham Central Station, jointly owned by the Great Northern and Great Central Railway Companies, is now rapidly approaching completion. The nature and scope of the work involved the closest application of engineering and architectural skill, and the outlay of vast expenditure, approximating probably to a million pounds. The actual extent of the station frontage is 250ft, and the building will rise to a considerable height. The elevation has been designed in the Renaissance style, and is being built partly of Darley Dale stone and partly of Nottingham pressed bricks. The main feature of the front is the tower, 22ft. square, which rises in the centre to a height of about 100ft. At each end of the elevation there are two very imposing wings, with pilasters on the ground floor and triple cylindrical columns on the first floor, whilst the booking hall, which is 104ft. long, 66ft. wide, and 35ft. high, will be lighted by means of four large semi-circular headed windows with stone mullions and jambs. A number of administrative offices are being provided on the first floor, and these will be reached by means of a balcony running round the booking hall at a height of about 18ft. or 19ft. Adjoining the booking hall is a very large cloak room, 50ft. by 40ft. The largest of the basements is that under the booking hall, measuring 125ft. by 66ft., and the floor of the latter apartment is supported by steel stanchions, plate girders, steel joists, and curved plates. The main luggage subway is 14ft. wide by 13ft. 6in. high, and the walls are of glazed brick. All the drainage and roof water from the station will be dealt with in underground passages connected with the main subway by means of circular culverts, 3ft. in diameter, in which will also be placed the gas and water pipes and electric cables. Though not so wide as the famous station at New

Street, Birmingham, the new Nottingham Central Station covers a larger area, the total area of the site being over twelve acres, and its length 2100ft., or three-eights of a mile; it measures 390ft. at its widest point. The roof, which is entirely of glass supported on steel principals is divided into three spans, those on either side measuring 63ft. 9in., and that over the main lines 84ft. 3in. Both to the north and the south end also there are awnings extending some 222ft. over the bays, and the main roof, which is 420ft. long, has glass wind screens at each end. All the walls in the station proper are faced with glazed bricks, with dressings of glazed vitrified terracotta. The walls of the dining and refreshment rooms are lined with Faience tiles. The floors are to be of ceramic mosaic, and the fittings of walnut. The main platforms (68ft. wide) can be reached from the booking hall by means of a steel footbridge 24ft. wide, and by the public footbridge from Glasshouse Street to Windsor Street. By an ingenious device the hand-rails on the roof are constructed so as to serve as water carriers; also to facilitate cleansing operations. The whole of the offices and buildings will be lighted by electricity. The entire work is under Mr. Edward Parry's, M.I.C.E., direct supervision, and he has been ably assisted by Mr. F. W. Bidder and Mr. A. E. Lambert, who have charge of the engineering and architectural work respectively, whilst Mr. A. A. Barker is the resident engineer. Mr. Henry Lovatt, of Wolverhampton, is the contractor, the excavators of the site and the large bridges for Parliament Street and York Street, with the retaining walls, permanent way, &c., having been carried out by Messrs. Logan and Hemingway.

Keystones.

Glasgow's First Suburban Theatre has just been built at Govan.

An International Art Congress is to be held next year in connection with the Paris Exhibition. The German Emperor has allowed the exhibition in the German Pavilion of the unique specimens of French art preserved in the Palace of Potsdam.

Sir Richard Moon died last week in his eighty-six year. He was chairman of the London and North-Western Railway Company from 1861 to 1891, and was created a baronet at the Queen's Jubilee in 1887 for his great work in railway enterprise in this country.

The British Fire Prevention Committee send us a copy of No. 27 of their publications, dealing with partitions, and state that last week some French floors, partitions and girder coverings were tested, when several foreign Government representatives were present. The results will be issued in due course.

The collection of Burne-Jones' Drawings at the British Museum has been considerably enriched by Lady Burne-Jones, who has presented to the Trustees a portfolio containing about 200 beautiful drawings, many being in coloured chalks, executed by her husband as designs for stained-glass windows and mosaic work.

Big Liverpool Fire.—A fire broke out last week at the timber yard of Messrs. Henry Quayle and Sons, Liverpool. The flames were got under, but sparks fell into Messrs. Grayson's timber stores and the yard of the Liverpool Creosoting Company, both places being gutted. Woodwork fittings for troopships for the Cape were destroyed, the damage being estimated at £100,000.

Sanitary Inspectors' Diploma.—The Education Department has approved the local examinations held by the Examinations Board of the National Union of Teachers as qualifying successful candidates to sit for the diploma of sanitary inspector. Holders of the diploma, the examinations for which are under the supervision of the Sanitary Inspectors' Examination Board, are eligible for appointment as sanitary inspectors under the Public Health Act (London), 1891.

A new Board School at Hackney Wick, N.E., has been opened.

One of the largest London fire stations is now being built at Maida Hill, W.

Ham Church, Surrey, is to have a chancel added to it.

Dr. Samuel Johnson, medical officer of health for Stoke-on-Trent, is dead.

We have received the 1898-9 (Forty-third) Report of the Vestry of the Parish of Chelsea.

A new Conservative Club at Nuneaton was opened on Saturday. Its cost is about £6,000.

The Bristol Society of Artists has presented to the Queen a collection of sketches made by its members.

A Fourteen-storey House in Paris (which is an innovation there) is being built in the Rue Mont Thaber.

A new lock on the Thames, 175ft. long between the gates and 20ft. wide, is being constructed at Shepperton to replace the existing one.

Dissolution of Partnership.—The firm of C. and L. Ower, architects and civil engineers, Dundee, has been dissolved by mutual consent.

The Guild Hall, Newtownards, was opened on Friday. Messrs. Young and M'Kenzie are the architects, and the building has cost £2,000.

A new East window in Gray's Inn Chapel, London, has five lights devoted to five Archbishops—Becket, Whitgift, Laud, Juxon, and Wake.

For building new hospitals at Leeds, the City Council have decided to make application to the Local Government Board for power to borrow £300,000.

A new County Infirmary at Omagh, just completed, has been built by Mr. J. Cothoun, of Londonderry, from the designs of Mr. Owen, of Dublin, at a cost of £13,000.

The County Museum at St. Albans, which has been built at a cost of about £1,700, was opened last Wednesday. It is one of the first purely educational museums opened in England.

Burnley's New Sanatorium.—In the particulars given last week of this building, the name of the architect, Mr. F. S. Button, was inadvertently given as "Britton." We regret this.

"The Green Dragon," Highgate, N., is almost pulled down. It was one of the houses where the burlesque oath known as "swearing on the horns" was administered in the coaching days.

The Bronze Statue of Sir Sidney Waterlow, upon which Mr. Taubman is now engaged, is to be erected in Waterlow Park, Highgate, N., on a granite pedestal in front of Lauderdale House.

The Northern Architectural Association opened its fortieth session at Newcastle last Wednesday evening, when the president, Mr. William Glover, F.R.I.B.A., delivered his inaugural address.

New Birmingham Art School.—The new branch school of art in Moseley Road, built in connection with the municipal school from the designs of Mr. W. H. Bidlake, was opened on Saturday.

The Chair of Architecture and Building Construction at King's College, London, rendered vacant by the death of Professor Banister Fletcher, has now been filled by Mr. R. Elsey Smith, A.R.I.B.A.

A Rubens Exhibition at Brussels is proposed to be held next summer. It is the outcome of the success attending the Rembrandt Exhibition at Amsterdam in 1898, and the Van Dyck Exhibition at Antwerp this year.

The Growth of London.—London south of the Thames has increased, between 1891-6, at the rate of seventy-three per 1,000, and one parish which comprised 62,000 houses in the Jubilee year, 1887, had increased to 102,000 houses in 1897.

New Patents.

1898.—Ventilators, Fanlights, &c.—20,516. R. Adams, London, S.E. The ventilator is hinged at the bottom and carries at the top end a metal frame having a spring latch and a cushion that presses against a curved arm pivoted to the lintel or window frame. The ventilator is opened by pulling the latch downwards and closed by pushing it backwards. Several modifications are shown. The same invention includes levers for releasing panic bolts. One of these levers is enlarged at the upper end and has the word "Push" on it. By pressing this the bolts are released and the door is opened.

Tiles and Bricks.—24,294. R. Bennett, London. The waste material produced in the separation of kaolin from the free silica is ground, made plastic with water, moulded and fired. The following proportions are given: Waste material, fifty-five parts; ball clay, thirty-three parts; flint or china stone (granite or Cornwall stone) or both, twelve parts.

Saw Guards.—24,861. W. A. Webster, Preston. A canopy (consisting of two wood side cheeks fixed to a semi-circular metal frame) fits over the saw, and is carried by parallel bars pivoted to a bar that is adjustably secured to a standard. The canopy has anti-friction bowls, and is counter balanced.

Band Saws.—25,623. A. Ransome, London, S.W. This invention relates to horizontal band saws, such as are used for cutting logs. The driven pulley carrying the saw has inside and outside bearings, so that it may move away from the driving pulley to get the desired tension on the saw. By means of gearing and nuts the saw may be made to run in any desired position on the face of the pulley.

Door Bolts.—26,318. J. May, Bolton. The bolt is mounted in the usual way, but has a spring which tends to push it outwards. Extending through the door, with a knob on the outside, is a rod that is directly opposite the knob on the bolt when the latter has been pulled back into the side slot. After the door has been closed it is thus possible to push in the knob on the outside in order to press the bolt knob out of its slot, release the bolt, and lock the door.

Pipe Joints.—26,644. E. Putzeys, Brussels. The joint is filled with a packing of fusible composition, in which are embedded one or more electrical wires, through which a current can be sent to fuse the packing, and form a hermetical joint.

Stage Floors.—27,000. E. O. Sachs, London, W. The floor is supported by a trussed arch having vertical side legs which run in guides and are connected with wire ropes, some of which pass over guide pulleys and carry counterbalance weights. Other ropes pass to the drum of a winch. By this means the floor can be raised as desired, and held in place by any suitable locking gear, such as draw bolts.

Drawing Pens.—27,146-47. E. Hervais, Paris. Instead of the working edges being pointed, they are spatula shaped, with a curved edge. This enables lines of any thickness to be drawn without altering the adjusting screw, by merely inclining the pen a little. The second patent consists in forming the blades of drawing pens of round steel wire, inserted in a socket at one end and suitably shaped at the other. This arrangement cheapens the cost. As the blades are too delicate to receive an ordinary adjusting screw, a small clamp is employed instead.

1899.—Surveyors' Levels.—6,981. C. L. Hett, Brigg. Arranged in conjunction with a a telescope fitted with spider webs is an optical square (preferably in the form of a solid glass prism) carried by an oscillating pendulum hung on pivots. The optical axis of the telescope is thus kept parallel to and in the same plane as the axis of the pendulum. The spider webs are adjusted, the instrument is then set up, and a balance weight in the pendulum is moved until the reading is correct by a colimeter. This adjustment can be checked and corrected in the field.

Incandescent Gas Burners.—16,212. H. BURKEST, Berlin. The gas is made to impinge on a platinum ball with depending wires and is thus lighted. The ball is placed directly over the gas outlet, and is so arranged that it is kept cool by an air current.

Mortising Machines.—17,241. W. LANGNER, Breslau, Germany. The upright rotary cutter is driven by hand through gearing, and is mounted in a frame that can be fixed with hand screws on the edges of doors, window frames, &c. The cutter frame slides (being moved as desired by screws), and thus enables the slot to be made. The depth and length of the cut can be varied as required.

Ventilating Fans.—17,591. A. GANS, Urfahr-Linz, Austria. The fan casing is stationary, but the discharge nozzle can be turned so that the current of air is distributed over a larger or smaller area. The fan shaft is mounted in specially arranged trunnions to facilitate removal.

The following specifications were published on Saturday last, and are open to opposition until January 1st. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898—18,483, STEIGER, manufacture of cement. 22,267, McINTIRE, rotary engine applicable also for use as a pump. 22,272, WILLIAMSON, means for generating, purifying, storing, and distributing acetylene gas. 22,404, KASTENS, appliance for the protection of "French" and similar windows. 23,751, circular saw guard. 24,378, ENGELS, manufacture of fire and acid proof bricks, slabs, and other earthenware articles or structures. 24,577, TAYLOR, drop hammer bolt. 24,582, WILLOUGHBY, refuse destructors. 24,762, LAKE (*Campanato*), process for the decoration of articles of wood, metal, stone, glass, &c. 24,957, WOODWARD and COLLIER, process and apparatus for fettling, cutting off, scratching, and otherwise finishing off sanitary pipes and the like while in a plastic or semi-dry condition. 25,227, THUBRON, acetylene gas generators for lamp and other apparatus. 25,384, WHITAKER, steam derrick cranes and excavating apparatus. 25,662, CONSTABLE and SAWBRIDGE, locks and latches fitted with reversible latching bolts. 25,988, GWYNNE and SARGEANT, centrifugal pumps. 26,154, TSCHERNOFF, means for heating by electricity. 26,221, MISSIRE and MISSIRE, *née* MAGNIM, mantles for incandescent gas lighting. 26,572, MOORE, regulation of sliding window sashes in their frames. 26,592, MARCH and HAGGO, nail making machines. 26,613, BOWDEN, apparatus for heating and purifying water. 26,856, KAYSER, mantles for incandescent lighting. 26,923, YOUNG and YOUNG, hooks for cranes and other lifting machinery and appliances.

1899.—786, ALGAR, sash fasteners. 1,042, BACKHOUSE, connecting device for liquid conducting pipes. 3,081, WIGLEY, composition for rendering fabrics fireproof. 6,204, KILNER, furnaces for glass manufacture and other purposes. 6,460, STONE and WHITE, combination spray and jet nozzle for garden syringes, hose, pipes, pumps, &c. 10,151, STEINER, apparatus for generating acetylene gas. 10,798, WHEELER and EELLS, composition applicable as a substitute for wood and stone and for the moulding of hollow ware and the like. 11,135, WORSNOP, acetylene lamps. 11,208, SCHOLEFIELD, method of glazing roofs and structures. 14,377, OKES, covers for man, hand and other holes in vessels subject to internal pressure. 16,454, NICHOLS, apparatus for drying veneers and the like. 16,546, STROUD, wrenches. 17,049, PALMER, ventilation of sewers applicable for other ventilating purposes. 17,067, BUCHNER and SAMET, window blinds, curtains and apparatus for operating them. 17,195, CLARK (*Süddeutsche Metallwerke Schad Herbst and Co.*), acetylene lamps. 17,232, PROST, water heaters for baths. 17,450, RODECKER, window screens. 17,498, WATSON, dust shields for the corners of stairs and other places. 17,631, RICHARD and CAHEN, generation of gas having acetylene as a base and apparatus therefor. 17,648, PATTON and GRANT, fire extinguisher. 17,849, PATTISON, water heaters. 17,928, BURNS, smoke preventing apparatus for steam boiler and other furnaces. 18,342, KIESEL and WATZINA, preparing glass and the like for the production of designs thereon by etching. 18,378, ARNOLD, clamps for holding work to benches and the like. 18,379, ASHLEY, plug taps and valves. 18,388, GOSLING and IMPROVED PATENT FORCED DRAUGHT FURNACE SYNDICATE, Limited, device for equalising the forced draught for steam boiler destructor or other furnaces. 18,803, NEWTON (*Hellström*), combined cornice and curtain hanger. 19,095, WERNICKE, apparatus for wiping or cleaning the panes of shop windows, &c. 19,142, ROBERTS, drawing board rest. 19,379, KRÖHNKE, method of purifying water.

New Companies.

Grimsby Property Company, Limited.

This company was registered on November 10th by Waterlow and Sons, Limited, London Wall, E.C., with a capital of £10,000 in £1 shares, to acquire any real or personal property, and to carry on the business of builders, cabinet makers, joiners, licensed victuallers, market gardeners, &c. Henry Hewins and John C. Store are the first directors, and may retain office so long as they hold twenty shares each. Registered office, Cedar House, Abbey Park Road, Great Grimsby.

Granite Quarries Companies, Limited.

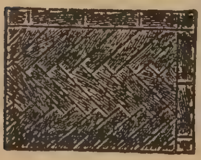
This company was registered on November 2nd by F. J. Leslie and Co., 15, George Street, Mansion House, E.C., with a capital of £3,000 in £1 shares, to acquire and work the Connaught Granite Quarries, at Fallmore, county Mayo, Ireland, and to carry on the business of granite and stone merchants, quarry owners, &c. The first directors (to number not less than two nor more than seven) are to be appointed by the subscribers. Qualification, £200. Remuneration as fixed by the company.

Manor House Estate Company, Limited.

This company was registered on November 4th by Kingsbury and Turner, 369, Brixton Road, S.W., with a capital of £5,000 in £1 shares, to acquire the Manor House Estate, Collier's Wood, Lower Tooting, Surrey, and to carry on the business of builders, contractors, stone, sand, brick, and hardware merchants, &c. The first directors (to number not less than three nor more than five) are to be appointed by the subscribers. Qualification, one share. Remuneration, £60 per annum, divisible.

T. and F. Caunt, Limited.

This company was registered on November 10th by F. Caunt, jun., 2, Devon Drive, Carrington, Notts, with twenty members, each liable for £1 in the event of winding up, to acquire and carry on all the businesses now carried on by Thomas Caunt, sen., Thomas Caunt, jun., and F. W. Caunt, as builders, joiners, and contractors, at Nottingham, and to acquire and deal with land, house, and other property. The first directors (to number not less than three nor more than seven) are Thomas Caunt, sen., Thomas Caunt, jun., and F. W. A. Caunt.



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COMING EVENTS.

Wednesday, November 22.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students evening.

SOCIETY OF ARTS.—D. E. Hutchins on "National Forestry." 8 p.m.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. W. A. Bond, M.A., M.D., D.P.H., on "Diseased Meat, with a Demonstration of Morbid Specimens collected from Meat Markets." 8 p.m.

EDINBURGH ARCHITECTURAL SOCIETY.—Debate on the "R.I.B.A." 8 p.m.

BIRMINGHAM AND DISTRICT CLERK OF WORKS AND BUILDERS' FORMAN'S ASSOCIATION.—Mr. J. C. Nichol on "Terra-Cotta." 8 p.m.

Thursday, November 23.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: the Bones and Muscles of the Trunk, and their Surface Forms."

LONDON INSTITUTION.—Mr. Stuart M. Vines, M.A., F.R.G.S., on "The Highest Andes" (illustrated). 6 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Ballot for the Election of Fellows. 8.30 p.m.

SOCIETY OF ARTS.—Meeting of Foreign and Colonial Section.

SOCIETY OF ARTS (Foreign and Colonial Section).—Mr. J. Ferguson on "Old and New Colombo." 4.30 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—(1) Mr. John Holliday on "The Cost of Steam Raising." (2) Mr. R. E. Crompton on "Influence of Cheap Fuels on the Cost of Electrical Energy." 8 p.m.

Friday, November 24.

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE.—Mr. Hirst on "Recent Developments of the Law relating to Drainage." III. 7 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. J. Miller Carr, on "Constructional Faience and Ceramic Mural Decoration." 6.45 p.m.

ARCHITECTURAL ASSOCIATION.—Sir Thomas Wardle, K.B., on "Art as Applied to the Weaving and Printing of Textile Fabrics." 7.30 p.m.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Discussion on "Glasgow Building Regulations," opened by Mr. R. W. Horn, A.R.I.B.A. 8 p.m.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. E. W. Hope, D.Sc., M.D., on "The Hygiene of Byres, Lairs, Cow Sheds, and Slaughter Houses, and all places where animals destined for the supply of food are kept, and the Hygiene of Markets, Dairies, and other places where food is stored, prepared, or exposed for sale and transported." 8 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Ordinary meeting at 8 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Lord Charles Beresford on "Openings for Mechanical Engineers in China." 8 p.m.

Saturday, November 25.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—(Newcastle-upon-Tyne.)—Council meeting at 1.30 p.m.

BIRMINGHAM AND DISTRICT CLERK OF WORKS AND BUILDERS' FOREMAN'S ASSOCIATION.—Visit to Council House, conducted by Councillor Lancaster, 3 p.m.

LONDON AND PROVINCIAL BUILDERS' FOREMEN'S ASSOCIATION (Memorial Hall, Farringdon-street, E.C.).—Mr. A. S. E. Ackermann, A.M.Inst.C.E., on "Thoroughness." 8.30 p.m.

Monday, November 27.

VICTORIA AND ALBERT MUSEUM (Lecture Theatre).—Mr. Hugh Stannus, F.R.I.B.A., on "The Historic Evolution of Applied Art—VIII. Greek Pre-Christian Art." 6 p.m.

PHILOSOPHICAL SOCIETY OF GLASGOW (Architectural Section).—"Stained Glass, Old and New, through the Lantern." 8 p.m.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 7 p.m.

SOCIETY OF ARTS (Cantor Lectures).—Mr. H. Hardinge Cunynghame on "Art Enamelling upon Metals."—II. 8 p.m.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—"Practical Methods of Stalling and Slaughtering Animals, Preserving and Storing Meat and other Foods." 8 p.m.

GLASGOW INSTITUTE OF ARCHITECTS.—Council meeting at 2 p.m.

Tuesday, November 28.

ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.—Mr. F. J. Bigger, M.R.I.A., on "The Antiquities of Inchcleraun in Lough Ree, co. Longford." Principal Rhys, LL.D., on "New Readings of the Drumloghan Ogam Stones." 8.15 p.m.

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Do. sheet, English, 6lb. per sq.ft. and upwards	do.	18	10	0	19	0	0
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Tin, Foreign	do.	129	10	0	130	0	0
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Zinc, sheets, English ...	do.	27	10	0	28	10	0
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Do. do. 2nd "	do.	10	10	0	12	0	0
Do. do. Unsorted "	do.	10	15	0	11	0	0
Do. do. White	do.	7	15	0	11	5	0
Do. Swedish	per P. Std.	12	0	0	16	15	0
Do. White Sea	do.	13	0	0	17	0	0
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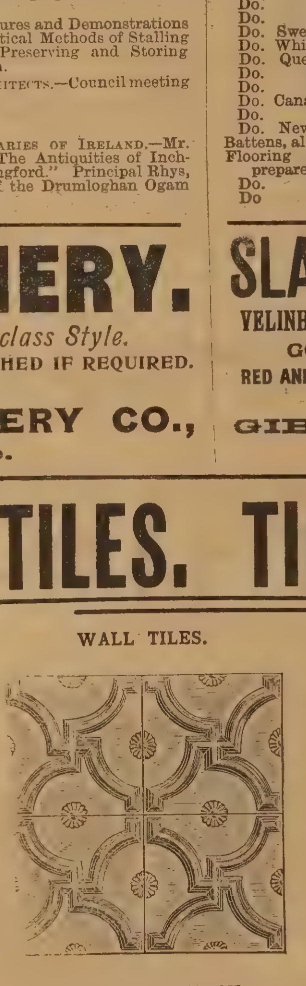

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Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks	do.	9 10 0	16 10 0
Wainscot, Riga (Baulk)	do.	3 15 0	5 15 0
Do. Odessa Crown	do.	3 15 0	5 15 0
Walnut, American	per cub. ft.	0 2 9	0 3 5

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

AMESBURY (Wilts).—For additions, &c., to the workhouse, for the Union Guardians. Messrs. John Harding and Son, architects, 58, High-street, Salisbury:—

Wort and Way	£1,551 0 0	E. Hale	£1,350 0 0
Vincent and Folland	1,395 0 0	W. Q. Cole, Amesbury*	1,255 2 8

* Accepted

BRACKNELL (Berks).—For pulling down present premises, and erecting five houses and shops, a cottage, and stabling, at High-street, Bracknell. Mr. A. E. Sidford, M.S.A., architect and surveyor, Wokingham, Berks:—

W. Wallis	£7,184	Bottrill and Son	£6,674
W. Watson	7,034	H. Charman	6,380
McCarthy E. Fitt	6,897	G. Brown	1,180
		J. B. Seward	5,933
Patman and Fotheringham	6,891	W. J. May, Bracknell*	5,781

* Accepted.

[Architect's estimate £5,725, at 7d. per cubic foot.]

GOSPORT AND ALVERSTOKE (Hants).—Cemetery works. For fencing, draining, and making paths in Ann's-hill-road, for the Alverstoke Burial Board. Mr. Harry A. F. Smith, architect, Star Chambers, High-street, Gosport:—

W. T. Dugan	£2,142 0	Lear and Son	£1,735
J. Croad	2,020 0	Lane and Son	1,690
Middleton and Co	1,977 10	C. M. Dash, Clarence-square, Gosport*	£1,679
E. Beaton	1,813 0		

*Accepted.

GOSPORT.—For the erection of new voluntary schools at Gosport, for the Gosport and Alverstoke School Council. Mr. Harry A. F. Smith, architect, Star Chambers, Gosport. Quantities by the architect:—

W. T. Dugan	£3,250	J. Croad	£2,890
Middleton and Co.	3,044	C. M. Dash	2,860
Light and Son	2,975	Lear and Son, Alverstoke*	2,720
Lane and Son	2,920		

* Accepted.

HARROW.—For the erection of manufacturing premises, for Messrs. Ingall, Parsons, Clive, and Co., Limited, of Birmingham and London. Mr. Owen P. Parsons, architect, 14, Temple-street, Birmingham:—

Colls and Son	£4,900	Smith and Son	£4,343
Clift Ford	4,755	S. G. Bird	4,296
A. and B. Hanson	4,556	C. Ansell	4,242
Thomas and Edge	4,498	W. H. Gibbs	4,150
Elkington, McKeveregan and Co.	4,448	Ferris Bros.	4,122
A. E. Wilson	4,396	Wingrove and Stanley, Northampton*	3,885

*Accepted.

LEICESTER.—For the erection of new wholesale markets, for the Corporation of Leicester. Mr. Walter Brand, architect, 16, Bishop-street, Leicester:—

Bentley and Co.	£41,773	Herbert and Sons	£32,395
H. Lovatt	38,700	Moss and Son	32,253
Shillitoe and Son	36,0 0	T. Herbert, Leicester*	32,050
Bowen and Sons	35,335		
Johnson and Son	32,839		

* Accepted.

LEICESTER.—For the erection of new printing works, for Messrs. W. Watts and Co. Mr. John P. Briggs, architect, Effingham House, Arundel-street, Strand, W.C. Quantities by Mr. James H. Swan, 8, Clifford's Inn, Temple Bar, E.C.:—

J. E. Johnson	£6,944	J. O. Jewsbury	£6,149
J. Chapman	6,231	Thos. Herbert*	6,075
H. Herbert	6,175		

* Accepted.

LONDON.—For the erection of cottage home for fifteen girls at Gordon House, for the London School Board. Mr. T. J. Bailey, architect:—

C. Wall	£3,024 0	Speechley & Smith	£2,307 0
Johnson and Co.	2,753 0	E. Triggs	2,276 0
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Lathey Bros.	2,439 0		
J. W. Brooking	2,423 0		

*Accepted.

LONDON.—For the erection of fifteen dwelling houses and shops, High-road, Chadwell Heath, for Mr. S. Leheup. Mr. Fred A. Ashton, architect, 177, Romford-road, Stratford, E.:—

W. G. Maddison	£12,157	J. and H. Cocks, Ltd.	£11,620
C. Chapman	11,947	A. E. Symes*	1 ,350

* Accepted.

LONDON.—For the re-building of 54, 55, and 56, St. Paul's churchyard, City, E.C., for Messrs. Henry Jones and Co. Mr. Eugene C. Beaumont, architect, 78, Fleet-street, E.C. Quantities by E. J. Gee:—

Kilby and Gayford	£3,577	Patman and Fotheringham	£2,381
Lascelles and Co.	3,296	Edwards and Medway*	2,657
H. Brown	2,897		

* Accepted.

LONDON.—For improvements to Penrose-street school, for the London School Board. Mr. T. J. Bailey, architect:—

Bulled and Co.	£6,963	J. Appleby	£5,833
Garrett and Son	6,950	J. and C. Bowyer	5,628
E. Triggs	6,200	W. Downs	5,545
J. Marsland	6,045	Smith and Sons, Ltd.*	5,513
C. Cox	5,899		

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LONDON.—For the erection of a new school at Holbeach-road, to accommodate 798 scholars. For the London School Board. Mr. T. J. Bailey, architect:—

Munday and Sons	£23,132	+ £270*
Kirk and Randall	22,092	+ 275
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Holliday and Greenwood	21,723	+ 290
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Stimpson and Co.	20,670	+ 210
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S. Hart	20,372	+ 150
Treasure and Son, London and Shrewsbury †	19,945	+ 215

* Additional, if walls of classrooms and halls are plastered.

† Accepted.

LONDON.—For the erection of four blocks of residential flats, Clapton-gardens, Clapton-square, E., for the Freehold and Leasehold Investment Company, Limited. Mr. Eugene C. Beaumont, architect, 78, Fleet-street, E.C. Quantities by the architects:—

Matthews	£12,086	H. M. Dove	£11,350
Brown	11,790	Grover*	11,342
Patman and Fotheringham	11,471		

* Accepted.

NEWCASTLE-UPON-TYNE.—For the rebuilding of the Percy Cottage Publichouse, shop, offices, &c., Percy-street, Newcastle-upon-Tyne, for John Stuart, Esq. Messrs. Pyle and Blackburn, architects, 15, Pilgrim-street, Newcastle. Quantities by Mr. G. Bell, 23, Westgate-road, Newcastle:—

T. Hutchinson	£3,675 8 3	W. Barton	£3,062 18 0
Kirk and Brown	3,461 12 8	N. W. Maughan	2,901 0 0
Middlemiss Bros.	3,385 0 0	S. F. Davidson	2,850 0 0
E. Weatherley	3,300 0 0	C. H. Manchlen	2,837 7 0
J. C. Hope	3,146 12 0	Amended tender*	2,822 17 0
J. & W. Lowry	3,100 0 0		

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OXFORD.—Accepted for converting No. 134, Cowley-road, Oxford, into banking premises for Messrs. Gillett and Co., bankers, Oxford. Mr. Herbert Quinton, architect and surveyor, 22, George-street, Oxford:—

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RISCA (Mon.)—For alterations and additions to the Wavnfawr Board Schools, for the Risca (Mon.) School Board. Mr. Geo. Rosser, Pontymister, near Newport, Mon., architects:—

Saxon Bros.	£138 15	Jos. Lewis, Pontymister* (accepted)	£120 0
John Pritchard	130 0		

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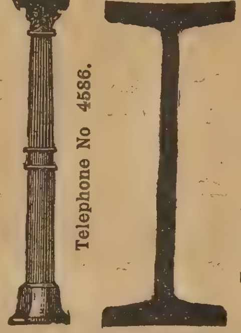

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J. Gethin	£4,960
J. Davies	4,870
Jenkins and Jones	4,750
J. T. Jones, Cefn, Ruabon *	£4,375

* Accepted.

TOTNES (Devon).—For the erection of a cottage hospital for nine beds. Mr. Edward Richards, architect, Manor Office, Torquay. Quantities by the architect :—

J. Smerdon ...	£2,410	0	0
J. W. McKellar	2,396	0	0
E. P. Bovey ...	2,390	0	0
W. Reeves	2,389	15	6
Vanstone and Mumford... ...	2,349	0	0
T. Brown	£2,343	0	0
W. A. Goss	2,310	0	0
S. Blatchford	2 300	0	0
R. F. Yeo	2,268	0	0
W. Smaridge ...	2,218	7	6
T. Brook, Totnes	2,000	0	0

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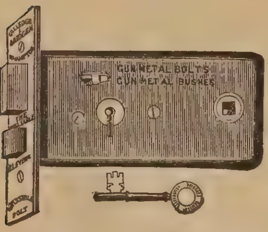

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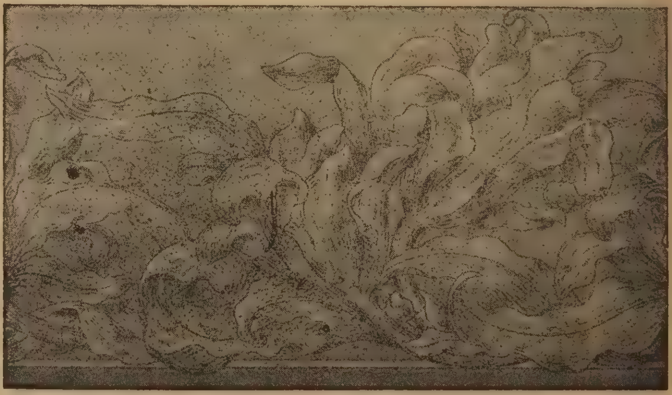

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VENTILATION AND WARMING.*

By KEITH D. YOUNG, F.R.I.B.A.

THE subjects of ventilation and warming which we are now to consider are so closely connected with each other that they cannot with propriety be treated separately. Ventilation or the systematic supply of pure air for breathing cannot be accomplished with any approach to success in cold weather unless it be combined with arrangements for warming. Conversely a room cannot be effectively warmed unless due provision be made for the supply of fresh air.

The vitiation of air is produced by several causes: (*a*) by the respiration of human beings and animals; (*b*) by combustion of coal gas, &c.; (*c*) by the decay of animal and vegetable organic matters; and (*d*) by certain processes of manufacture. In the act of breathing we inhale air at the rate of about seventeen respirations per minute, and at each respiration about 30·5 cubic inches of air passes in and out of the lungs.

It is important to note that respired air is raised in temperature to nearly that of the blood—98·4 F. The air which is exhaled from the lungs is robbed of about a fourth part of its oxygen, and an added amount of carbonic acid is substituted, it is considerably more moist, is higher in temperature, and is the carrier of a certain amount of more or less putrescible matter. It is this organic matter which forms the hurtful element in impure air; and because the presence of the organic impurities bears a definite relation to the excess of CO_2, it is customary to regard the latter as the measure or index of impurity.

Air is liable to be vitiated by combustion. The bituminous coal which we burn in our grates gives off three times its own weight of carbonic acid, besides sulphurous, acid and other gases. It also sends out soot, finely divided particles of carbon, and some steam. The products of combustion of coal gas in ordinary burners are carbonic acid, carbonic oxide, compounds of ammonias and of sulphur. Roughly speaking, every gas burner using gas at the rate of 3ft. per hour vitiates the air to the same degree as three men. It must not be forgotten that the escape of coal gas from leaky pipes or mains into houses is a very real source of danger.

Ventilation may be described as such a measure of renewal of air for breathing as will preserve a reasonable standard of purity without producing draughts. At the outset it is necessary to recognise the fact that it would be impossible to keep up such a movement of air in an inhabited room as takes place in the open air, and that it is therefore out of the question to maintain the same standard of purity. The average velocity of the air is said to be about 17ft. per second, and it rarely, in the calmest weather falls below 6ft. per second. It follows from this that, as Sir Douglas Galton points out, the quantity of air flowing over a man standing in the open in one hour would amount to 196,400 cubic feet, and this with a practically imperceptible wind. Since it is impossible to provide in a climate like ours for such an enormous volume of fresh air as would be necessary in order to keep the air of a room as fresh as that outside, it is necessary to adopt some standard of impurity as a maximum which must not be increased.

From a large number of experiments made by De Chaumont on the air of barrack rooms and wards of hospitals it was found that an addition of ·2 per 1000 of CO_2 to the ·4 per 1000 contained in normal air represented the permissible limit of impurity. The object of ventilation is, therefore, to prevent the standard of impurity exceeding ·6 per 1000 of CO_2. Since every adult at rest expires about ·6 CO_2 per cubic foot of air per hour, it needs but a very simple calculation to show that the amount of fresh air required per hour for an adult of either sex when at rest is 3000 cubic feet.

Systems of Ventilation.

It is convenient, though not strictly accurate, to divide methods of ventilation into two classes, one of which is called natural, the other mechanical or artificial ventilation. By natural ventilation I mean that in which the agencies employed are such as are to be met with in ordinary domestic buildings, windows, fireplaces with chimneys and ventilating gratings or openings such as do not require machinery to work them. We have seen that in theory an amount of 3000 cubic feet of air should be supplied per hour to every adult at rest. In our climate it is found that it is not practicable to effect a complete change of the air of a room at a greater rate than three times per hour without causing unpleasant draughts. It follows, therefore, that if every individual is to be equipped with 3000 cubic feet per hour he must be provided with room space of not less than 1000 cubic feet. It will be quite obvious to everyone that such an allowance, however desirable, is altogether impossible; and, indeed, it is not by any means so certain that this amount is either necessary or, in some circumstances, desirable.

If we lived in rooms which were so fashioned that walls, floors, doors, and windows were impervious and air-tight, it would be necessary to adopt some means of ventilation which would be powerful enough to supply the necessary amount of fresh air both for respiration and for combustion of fuel. But the conditions under which we live are very different to this. In addition to the amount of air passing through the spaces afforded by ill-fitting doors and windows a very considerable movement takes place also through the porous materials of walls and ceilings. What is it that causes a ceiling to become black like a gridiron, showing white lines where the joists occur? Simply that where there is nothing over the plaster to check the passage of air the plaster acts like a filter and intercepts the dust carried by the air.

Practical considerations therefore may and should be taken into account in fixing the amount of cubic space to be provided. It will be convenient here to see what is considered necessary in practice: In dormitories occupied by night only by adults or children in health, 300 cubic feet; in barrack rooms occupied by day and night, 600 cubic feet; in elementary schools, 150 cubic feet; in hospitals, from 800 to 2500 cubic feet. The foregoing are from official sources, and may be regarded as more or less of established authority. As to dwelling houses, there is no recognised official standard, but most authorities appear to agree in regarding 500 cubic feet per head as the minimum amount. If we exclude hospitals from our consideration, it will be seen from these figures that the standard of fresh air supply implied by no means reaches the theoretical amount of 3000 cubic feet per head per hour.

The Simplest Mode of Ventilating

a room is to open the windows. In cold weather it is found impracticable to do this, on account of the draughts; and a large majority of people not only close the windows of their bedrooms even in hot weather but shut down the registers of their fireplaces. It is therefore desirable in all dwelling rooms to provide openings for the passage of air independently of the windows and fireplaces.

All ventilation requires for its working three agencies: First, an inlet; second, an outlet; and third, a head or motive power. If one of these three be omitted there can be no ventilation. Head or motive power in natural ventilation may be regarded as a difference of air pressure between two sides of a column of air. This can be obtained either by the action of wind or by a difference in temperature between the outside and inside air. Wind acts either by perflation, as when a window is opened in a room on the side facing the wind and another window or a door is opened on the opposite side, or its action is that of aspiration or sucking, as when a wind passes horizontally over the mouth of a chimney or tube placed at right angles to its course; the effect of this is to reduce the pressure on the air in the shaft and so cause an up-current.

Air, when heated, expands and becomes lighter, and its expansion is in a known ratio to the heat applied. Independent air inlets should bear a due proportion to the outlets for each separate room. The area of any ordinary smoke flue is 81 square inches, and the velocity of the air therein with a fire burning may be taken as 600ft. per minute. This means an extraction of some 20,000 cubic feet of air per hour. To provide for a supply of fresh air equal to the amount extracted at a maximum rate of inflow of 5ft. per second, an opening of nearly 144in. in clear area would be required. The shaft through the wall should be splayed so that the area of the inner opening will be not less than double that of the external opening. By this means the velocity of the air current is considerably reduced, and the incoming air is dispersed over a larger surface. With all air inlets it is important to see that the provision for the admission of air is adequate to the size of the room.

Air Outlets.

To provide openings for the exit of air in an ordinary dwelling room with an open fireplace is, in my opinion, a mistake. The fire is a most efficient extraction shaft, and if other openings are provided they will either become unnecessary inlets, or, if provided with back pressure valves, will be useless. The only way in which an extract ventilator can be usefully employed as an adjunct to the chimney is to place it in the flue itself; and in such a case it must be provided with an efficient flap to prevent the escape of smoke. But it will always be found that if the ventilation of a room is deficient, it is better to increase or improve the air inlet than to add an extract shaft. This question of the provision of sufficient air for the combustion of fuel and for ventilation is, perhaps, the most important one, at any rate in ordinary domestic buildings.

There are many rooms which require to be ventilated independently of open fireplaces, and, of course, rooms with open fireplaces require ventilation at times when the fires are not alight. So long as open windows can be tolerated there is little or no difficulty in ventilating; but when the weather is too cold for this, and fires are, for one reason or another, not available, the difficulty of providing efficient ventilation becomes very great. The problem really resolves itself into how to admit fresh air in sufficient volume without it being perceptible to the inmates of the room.

The Tobin tube is one way of doing this, and, if rightly managed, is a very good one. It is not necessary to make the tube a very long one; indeed, the shorter it is, the better. The main object is to give the incoming air an upward direction, and to cause it to spread as much as possible. The simple expedient of fixing a deep board on the window sill and raising the lower sash a few inches, so that air can flow in between the upper and lower sashes, is quite as effectual, less costly, and less unsightly than a Tobin tube. But there always comes a time when neither windows nor inlet tubes can or, at any rate, will be kept open. And when this happens the resources of natural ventilation are exhausted and recourse must be had to mechanical and more costly contrivances.

Warming.

We must now turn our attention to the subject of warming. Warming may be accomplished by one of several methods:—By open grates, by close stoves, by hot-water pipes or coils either with or without fresh air, by steam, or by hot air produced in a central stove or battery of pipes and delivered through specially arranged ducts. In an open grate the heat rays pass through the air without perceptibly raising its temperature, and warm the walls, floors, and ceiling of the room and the furniture and persons present. These in turn in varying degrees radiate their heat, and so warm the air. The heat in hot-water or steam pipes is conducted from the water to the inner surface of the metal pipe, thence to the outer surface, and thence to the air which it warms by direct contact. In the third system, which for want of a better name is called indirect radiation, the air is delivered to the room ready warmed, and, as a rule, is either propelled into or sucked out of the room by fans or heated extraction shafts.

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* A paper read, on November 2nd, at the Carpenter's Hall, E.C.

The open fireplace is, and, I believe, will always remain, the universal means of warming for domestic purposes. As I have already pointed out, the heat rays from an open fire pass through the air without raising its temperature to a perceptible degree, and thus while our bodies are warmed we breathe air at normal temperature.

Fireplace Design.

The essential principle to be observed in the construction of an open fireplace is to obtain the greatest amount of heat from the smallest quantity of fuel with the least amount of smoke and the minimum production of cinders. In other words, the greatest possible efficiency combined with economy. Nearly one hundred years ago, Count Rumford pointed out the enormous waste of fuel in London, and the resultant fog and dirt. Since then, no one has done more to improve the construction of the domestic fireplace than Mr. Pridgen Teale, the distinguished surgeon of Leeds, and there is to-day no more economical or efficient fireplace than the one which bears his name.

The first thing to observe is that iron is the worst material for a fireplace and should enter into its construction as sparingly as possible. The back and sides should be of firebrick and the brick should lean over to the fire. The lean-over not only increases the power of absorbing heat from rising flame but the increased temperature in the firebrick raises the gases to combustion point which would otherwise pass up the chimney unconsumed and thus be lost. As a consequence of the lean-over back the grid on which the fire is laid must be deep. Mr. Teale fixes the depth at not less than 9in. for a small room, and not more than 11in. for a large one. The sides or covings should be vertical but inclined to one another as the sides of an equilateral triangle the apex of which would be behind the fireplace and the base in a line with the front. The working out of the inclination to be given to the sides was arrived at by several stages; but in the result it was based on the fact that the greatest amount of radiant heat is thrown off at right angles to the surface of the radiator. The inclination of the sides is such that the perpendicular line from the inner side of one coving just misses the outer margin of the opposite side. Mr. Teale advocates upright bars mainly from the point of view of appearance, because ashes cannot lodge on them. The space under the bars is to be closed by a metal shield called an "economiser," which cuts off the stream of air that usually rushes through the bottom of the fire, thus making the heated coal dependent for its combustion on the air passing over the front and the upper surface.

Before leaving the subject of open fires, I must refer to the grate having an air-chamber behind the fire, the object of which is to admit warmed fresh air into the room as an auxiliary to the radiant heat from the burning coal. Several kinds of grates on this principle have been devised, among the most successful being those designed by the late Sir Douglas Galton and the late Mr. D. O. Boyd. The Galton grate is made with an air-chamber behind the firebrick back of the grate, to which air is admitted from the outside, and from which a pipe ascends to a grating near the ceiling, whence the heated air emerges into the room. Boyd's grate also has a large air-chamber at the back, but the fresh warmed air is admitted to the room through a grated opening immediately over the fire grate. To my mind the defect in both these grates is the large amount of iron which enters into their construction, and which, while adding greatly to the available heating surface, gives an unpleasant dryness to the warm air. Another grave objection to the use of this kind of grate is that it involves the construction of air shafts, which, if not constantly examined and cleaned out, may become a source of danger. This is especially the case in hospitals where air trunks, whether accessible or not, are things to be avoided.

With regard to close stoves for domestic purposes it may be said they are not, and are never likely to be, much in vogue in this country. We must now consider the methods of

Warming by Hot Water or Steam,

which, in dwelling houses, are mainly used as an auxiliary to open fireplaces, and for warming such places as large halls and staircases, billiard rooms, etc. Hot water or steam has the advantage that, instead of many, there is only one fire to be attended to.

Hot-water heating may be divided into two classes—low pressure and high pressure. In low pressure hot-water work the system is open to the air, and is, therefore, subject to the normal pressure of the atmosphere. In the high pressure system the whole of the pipes are sealed, and the room for expansion of the water is provided within the system itself.

It is very necessary in dealing with any system of hot-water circulation, whether for warming or for domestic uses, to have a clear understanding of the power which produces the circulation. Everyone is familiar with the ordinary domestic hot-water system; a boiler at the back of the kitchen fire supplying hot water to a bath on the first floor. Most people are also aware that water expands when heated; and the result is that a great many people assume that hot water circulates because being lighter it rises to the top. The real cause is this: At the top of the house above the highest point of supply is a cistern whence cold water is conveyed direct to the boiler or cylinder, as the case may be. This descending pipe is a column of cold water which by its greater weight overbalances the column of hot water ascending to the bath and so keeps the circulation going. It is the expansion of the water in the boiler plus the downward pressure of the cold water which causes the movement.

Hot-water warming may be employed either with or without the admission of fresh air. If no fresh air is admitted in connection with the coils or pipes, the ratio of heating surface should be 12ft. linear of 4in. pipe to every 1000ft. of cubic space. If fresh air be admitted over the coils or pipes, this amount should be increased by one-third. This rule is, of course, subject to variation; in rooms, for example, with a very large proportion of glass the amount of pipe would have to be increased. However the pipes are arranged, whether in long lines or grouped in coils or radiators, care should always be taken to ensure that there is plenty of room for cleaning all round.

The following is an important practical point affecting the construction of boilers and cylinders. The weight of a column of water is approximately ½lb. to the square inch of surface; therefore, by every foot of height by which the distance between the cold-water cistern and the boiler is increased, the pressure on the latter is increased by ½lb.

The system known as

High Pressure

need not detain us long. It consists of a coil of small iron pipes built into a furnace, a pipe from the upper part of the coil being continued round the room or building to be warmed and returned into the lower part of the coil. The pipes are very strong, but of very small bore. An expansion pipe is fixed at the highest part of the apparatus, and the whole of the pipes, after being filled with water, with the exception of the expansion pipe, are hermetically sealed. The water in the pipes when heated expands, and would, if it were not for the space left in the expansion pipe, burst the pipes. There being no escape for the steam, the temperature can be raised very considerably above 212deg. Fahr., the boiling point of water. The system cannot be regarded as a safe one, and it is open to the further objection that the intense heat generated in the pipes has a deleterious and unpleasant effect on the air.

Steam heating is not so much in favour in this country as it is in the United States, and, indeed, it is not so well suited to the purposes of direct radiation as hot water. It may, however, be used with advantage in cases where exhaust or waste steam is readily available, or, with careful safeguards against waste, may be used economically with live steam. At the Derbyshire Royal Infirmary steam coils are used in the wards to supplement in case of need the open fireplaces. Each coil is formed of three hinged leaves, made of copper pipes and enclosed in a carefully made iron closet fixed under a window. Gratings in the outer wall admit fresh air to the coil and a horizontal opening at the window-sill level admits the fresh warmed air to the ward. The object of making the coil in three folds is that 33, or 66, per cent. of the heat can be turned off or on at will, and the object of hinging the folds is to allow each one to be swung out separately for cleansing.

So far then for warming by direct radiation. We now have to consider the methods of

Warming by Hot Air,

and in connection with this part of our subject it will be convenient to consider also methods of artificial or forced ventilation.

Warming by hot air may be carried out in several ways. The source of heat may either be a stove or furnace, coils of hot-water pipes, or steam pipes. The heated air may either be propelled into the various rooms by mechanical force or it may be drawn into them by the action of fans or other agencies that suck the air out. In all cases there must be some mechanical force exerted to produce the requisite movement. Some years ago, two medical men at Liverpool turned their attention to the subject of warming and ventilating domestic houses; and though they explicitly affirmed that they recommended the warming of the incoming air and *not* warming a house by hot air entirely, their example led to the construction of a few houses which depended for their supply of warmth entirely on hot air. A house was erected at Chiswick soon after the publication of Dr. Hayward's little book in which the heat for every part was supplied from a furnace in the basement through trunks formed in the walls. The extraction flues were all connected into a shaft surrounding the iron smoke flue from the kitchen range. All windows were hermetically closed and there were no fireplaces. The warmth of the iron flue-pipe produced the necessary up-current in the extraction shaft so long as the kitchen fire was going. When it had been out some time and the flue pipe got cold, its extracting power must have been considerably lowered. I cannot conceive a more objectionable mode of building, and it is not surprising to learn that after four years' occupation it was found desirable to make the windows to open, and to provide open fireplaces in the rooms.

Heating Large Buildings.

When considering the warming and ventilating of large halls, schoolrooms, churches, and the like, it becomes clear that the conditions demand an altogether different treatment from that suitable to domestic buildings.

In a concert hall, for example, although owing to the height of the room, the cubic space per head may be fairly abundant, yet the audience are so closely packed together on the floor that the vitiation of air is as great as if the cubic space were as low in proportion as the floor space. Everybody has felt at times the intensely oppressive feeling of the air in a lofty church which is crowded with people on the floor level but has a vast empty space above. In such a building it is absolutely impossible to obtain effective ventilation without some powerful mechanical means of moving the air frequently and thoroughly.

Methods of Moving Air.

Air may be moved either by aspiration or sucking out or by propulsion or driving in, or by a combination of both methods. If aspiration or extraction be employed the force or motive power is placed in the outlets for foul air. If propulsion, then the motive power is placed in the inlets for fresh air. In the ventilation of the House of Commons both methods are employed. The air is drawn in from the river front by large fans and passed through cotton wool filters before it is warmed or cooled, as the case may be, preparatory to being admitted to the House; and the vitiated air is drawn off by an up-cast shaft in the clock tower, at the base of which is a large fire to induce the upward current.

In the new General Hospital at Birmingham the propulsion, or what is called the "Plenum," system is used. The air is drawn into the main inlet by powerful fans; after passing through a jute screen which is kept watered by a constantly running series of jets it enters the main trunk and passes through the various distributing trunks to the several wards and rooms. The windows are all hermetically closed and there are no fireplaces; the air, therefore, must perforce pass out at the openings provided for the purpose. Although this system has been very largely advertised by its advocates as something quite new, facts do not warrant such an assumption. Five and thirty years ago the Lariboisière Hospital in Paris was warmed and ventilated in two ways. One half of the wards were treated on the propulsion system and the other half on the aspiration or extraction system. And the result of the practical working of the two systems was considerably in favour of the propulsion system. The system consists in forcing fresh air by means of a fan driven by steam power into the wards, the vitiated air being driven out through vertical shafts arranged for the purpose. To all intents and purposes this is what is now called the Plenum system. The application of such a system as this, however carefully contrived, to the wards of a hospital is, in my judgment, a mistake, and a mistake that may be followed by very grave consequences.

Quite apart from the fact that warming by hot air is neither natural nor pleasant, the adoption of such a system, involving, as it does, the absolute closing of all windows, and the construction of long channels and shafts for the conveyance of the air, is entirely opposed to all that experience has taught us in hospital hygiene. Neither is there any solid foundation of fact to show that what is called natural ventilation has failed in such a way as to call for its abolition. On the contrary, there is abundant evidence to prove that the results obtained in hospitals ventilated by natural means are better than in those provided with mechanical appliances and with sealed windows.

There are parts of hospitals, however, which cannot be thoroughly ventilated without the help of mechanical means of moving the air, and in such cases the Plenum system is most valuable. In an operation room, for example, where a large number of students are crowded into a comparatively small area, and where it is essential to change the air thoroughly in a very short space of time, powerful means must be adopted for moving the air. At the operation theatre at

The Middlesex Hospital

the motive power is compressed air ejected into both inlet and outlet shafts through specially constructed nozzles. The fresh air is admitted in the basement through a jute screen, kept moistened by a water spray, into the filter chamber, where it passes through a series of layers of cotton wool; from here it enters the coil chamber, where it is in cold weather warmed by passing over hot-water pipes, and thence passes to the theatre and the anæsthetic room. The action of the compressed air in escaping from the nozzle is to form what is called an air cone. The compressed air enters the small annular space and escapes through the aperture in the periphery or mouth of the nozzle. The effect of this is that the air in front of the nozzle is driven forward with the force imparted to it by the released compressed air, and a partial vacuum is formed behind which is quickly filled up with incoming air. A regular flow of air which can be regulated to a nicety is thus established in the tube. The vitiated air is extracted at two points, the main outlet being at one corner of the theatre in the highest part, and a smaller one over the sinks in the recess, which is only about half the height of the theatre. The actual working of this system is that the air of the theatre can be changed completely ten and a half times per hour without any perceptible draught. Air nozzles are fixed both in the outlets *and* inlets in order that in certain conditions of the atmosphere the force of the incoming air may be assisted by that of the extraction shaft, but as a rule force is used only in the inlet shafts. It has been found possible to operate for many hours continuously in the thickest London fogs with a perfectly clear air in the theatre. In the anæsthetic room, which is very small and lighted only by a sky-light, the air is changed fourteen times in the hour.

The main difficulty to be got over in using compressed air is the noise produced by the escape into the tube. Various devices have been tried, but it is at present not possible to suppress it altogether. I may say, however, that at the Middlesex Hospital the noise has been so reduced that it is not noticed. By increasing the number of nozzles in a tube the output of air can be increased, and by experiment it has been found that three nozzles grouped together in the centre of a horizontal tube give better results than the same number placed at intervals. If, for any reason, it is not possible to use compressed air for the purpose, the same effect can be obtained by the use of steam jets.

Fan Propulsion.

As I have already indicated, motive power can be supplied by means of fans worked either by steam power, by a gas engine, or by an electric motor: and there are many places where a fan can be used where neither compressed air nor steam can be applied. It should, however, be noted that while with the very best form of fan made some proportion of the force is lost by friction, practically the whole of the force is utilised with an air or steam nozzle. A further advantage of the jet system is that the whole of the apparatus is controllable from the engine-room, and that the working parts are of a much simpler and more lasting nature than those in use where a fan is employed.

Surveying and Sanitary Notes.

The Road Repairing Nuisance.—In consequence of this nuisance Dr. J. Fletcher Little, a member of the Marylebone Vestry, will move a resolution that a subway for pipes, wires, &c., shall be made from Tottenham Court Road along Oxford Street and Edgware Road to Chapel Street.

The Surveyors' Institution.—The first ordinary general meeting of the session was held on Monday in last week, when Mr. Thomas Miller Rickman, the president, occupied the chair. In the course of his opening address he suggested the division of the fellowship examination into a preliminary and a final, the former confined to book work and the latter to practice pure and simple. The surveyor's knowledge should be of a wider and more general, if less profound, character than was necessary in some of the more specialised professions. The *status* of the members of the profession had very greatly improved during the last fifty years, and the profession itself had risen in public estimation. To building and measuring surveyors the present state of the skilled labour market was a matter of anxiety. The most acute symptoms of the crisis in the building trades naturally occurred in the metropolis, but the effects would be felt before long both in the quantity and quality of the skilled labour available for building operations in the country districts, which London was sucking dry. The country workshop was now the only nursery of the London building artisan, for it was in the country alone that he found the opportunity of apprenticeship to his craft. The tendency of the time was towards the absorption of the masters in separate trades, and the aggregation of work in the hands of the capitalist employer, who found it to his interest to substitute mechanical for hand processes in every possible way. As regards the men, in every organised calling there was a tendency towards restricting the numbers of those that entered it. He feared that the average quality of the work had declined, and it was here that the decline of the apprenticeship system made itself felt. There was hope that the masters would see the necessity of laying aside their objections to the presence of apprentices in their shops, and would come to some agreement with the men as to an increase in the number of young hands to be introduced, in order to keep the trade alive and prevent it from degenerating as regards quality of work. The revival of the apprenticeship system must come from within, not from without.

Purifying Sewage.—In their report to the Manchester City Corporation Messrs. Baldwin Latham, Percy F. Frankland, and W. H. Perkin, jun., say that an inspection of numerous sewage works has convinced them that there are but three methods of sewage treatment. Sewage could either be disposed of without purification, separated into its constituent elements by precipitation, or destroyed by being resolved into simple and inoffensive materials. They express themselves in favour of the last method, which, in their opinion, is the only one in which any purification proper takes place. They also state that the employment of bacteria in some shape or form is the only practical means available for the purification of sewage. An examination of the land at Davyhulme shows that 125 acres are available for the purpose of treating the sewage by bacterial processes. In order to anticipate the difficulties of the future, as well as to make certitude doubly sure, experiments have been made with the refuse of trade effluents as yet not coupled up with the sewage system of Manchester, and it is found that their effect on the purification processs by bacterial agency "is not likely to be of a serious character." The main conclusions of the experts are "that the bacterial system is the system best adapted for the purification of the sewage of Manchester," and "that any doubts which may have arisen in the first instance as to its suitability, owing to the presence in Manchester sewage of much manufacturing refuse, have, through the convincing results of our experimental enquiry, been entirely banished." The experts also report that "with regard to the amount of sewage which can be purified by a given bed without the latter being over-taxed, our prolonged experimental enquiry has shown that each bed may safely receive four fillings in the twenty-four hours, provided that the sewage has undergone the preliminary subsidence and septic preparation in tanks, and that the bed is accorded about one day's rest in every week. In the event of a bed having been unduly taxed, its efficiency is only temporarily impaired, and can be restored by a few days' repose." The experts advise that sixty acres of bacteria beds should be constructed on the double contact system, and they estimate that this area will be sufficient to purify thirty million gallons of sewage per day. The average dry weather flow of Manchester is about twenty-four million gallons. That a sufficient margin has been allowed for the treatment of storm water and for other contingencies will be apparent after careful consideration of the entire report. One fact is pre-eminently worthy of quotation in this connection. It is found by experiment that the double contact system—that is to say, the method of treating the tank effluent in two bacteria beds—is found to produce a filtrate so pure as to be considerably above the standard fixed by the Mersey and Irwell Joint Board. It is also found that if the filtrate of a first contact bed be mixed with that of the second the resulting effluent conforms to the requirements of the standard. The value of this discovery cannot be over estimated, inasmuch as it indicates that the demands of the experts are, if anything, considerably over rather than under the mark.

NARROW LONDON.

ON Wednesday evening last the Society of Arts opened its 146th session, Sir Frederick Bramwell presiding. As Sir John Wolfe Barry was unable to be present, his paper, of which the following is a summary, was read by the secretary, Sir Henry Trueman Wood.

The daily influx of inhabitants from the outskirts of London to the central parts was, to a great extent, the creation of the last thirty or forty years, and it was no unreasonable estimate to suppose that 960,000 people enter and leave London daily by railways alone, and that the number of roadway vehicles has trebled in the last twenty-seven years. Considering what it was to-day, it might well be asked what would be the traffic thrown on our streets in the next thirty years, when it has been estimated there will be a population of 12,000,000. The County Council's officers estimated the total cost of the new street between Holborn and the Strand at £4,862,000, and the immediate selling value of the new frontages and surplus land at £4,088,000, showing a net commercial loss of £774,000. The great thoroughfare, 125ft. wide from west to east of London, which he advocated, would, with subsidiary connections, be 5½ miles in length, and, yard for yard, would compare favourably with the Holborn-Strand scheme. The nett cost, assuming that the ground-rents were sold at once, would be £5,750,000, and if the ground-rents were retained for sixty years, the street could be made without any ultimate financial burden on the ratepayers. He then dealt with his proposal for crossing the great streams of traffic at different parts. At Hyde Park Corner the west and east traffic would pass under the stream going north and south by means of a broad sunken road, leaving the Knightsbridge road on the north side, and rejoining Piccadilly on the south side. A strip of land of an area of 3·1 acres would be required from Hyde Park and from the Green Park, and practically no buildings would be affected. At Piccadilly Circus the work would be much more difficult and expensive. The north and south traffic would cross under the west and east traffic by means of a central sunken road descending from the north end of the Regent Street quadrant opposite Vigo Street, passing under Piccadilly Circus, and emerging in the Haymarket, the portion under Piccadilly Circus and Coventry Street being in tunnel for a length of some 180 yards. At Ludgate Hill the north and south traffic would be crossed over the east and west stream by means of a low viaduct and bridge leaving New Bridge Street on the west side and joining Farringdon Street on its west side. The natural way of dealing with this crossing would be to form a bridge from Fleet Street to Ludgate Hill, but the railway bridge across the latter made it practically impossible. At Oxford Street and the south end of Tottenham Court Road, the west and east traffic would cross over Tottenham Court Road on the north side of Oxford Street. At Wellington Street, Strand, the crossing ought to form part of the present scheme of the London County Council for their great new street if it was to be a really successful work. The gradient of Wellington Street clearly indicated that the north and south traffic should cross over the Strand. The crossing street would ascend from the corner of Tavistock Street and Wellington Street by easy gradients, keeping to the west side of the latter street, and descend by a grade of one in thirty to rejoin Wellington Street at the north end of Waterloo Bridge. At the passing of the north approach of Southwark Bridge over Upper Thames Street, the crossing street would continue the level of the north end of Southwark Bridge and would be parallel to and to the east of Queen Street, descending to rejoin the existing level at the corner of Cannon Street and Queen Street. The annual saving to the inhabitants of London by improved means of communication Sir John estimated at £2,154,000. His figures showed that in one hour more vehicles and pedestrians passed a given spot in the Strand than in Cheapside or Piccadilly.

Masters and Men.

The Cheshire Joiners have been granted an advance in wages to 8d. per hour.

The Strike at the Simplon Tunnel Works came to an end last Monday, without the men's demand having been granted.

Carters' Strike in Edinburgh.—The fifty carters in the employment of Mr. D. Y. Abbey, of Leith Walk, have come out on strike for an advance of 1s. per week. Their present wage is 22s. for driving a single horse and 24s. per week for driving a pair of horses.

Dispute between the Bricklayers and Plasterers.—There is likely to be friction between the Operative Bricklayers' Society and the Plasterers' Union. Voting papers have recently been sent out by the Council of the Bricklayers' Society asking the opinion of their members upon the question of the repeated attempts which have been made by the plasterers to secure for themselves work which has hitherto been claimed by the bricklayers, this work being floor and wall tiling, including hearths, stoves, &c. The Council naturally strongly object to this action of the plasterers, and word these voting papers evidently with the intention of biasing the members' opinions. It seems to us that this is fighting about work which strictly belongs to neither trade, for only a tile-fixer is properly capable of doing it. If strife occurs it will be most deplorable, for the great loss will not fall upon these two unions, but on the employers whom one or other will strike against. Such internecine strifes are suicidal, and we would suggest that as the work in question is of such a nature that a good workman, whom we should call a "tile-fixer," of either calling is equally capable of doing the work in dispute, it should be permissible for a member of either society, at the discretion of the general foreman, to carry out such work.

Conciliation for the Building Trades.—The Amalgamated Society of Carpenters and Joiners have decided by 8,748 votes against 3,965 in favour of the national scheme of conciliation of the building trades. The proposals embodying this scheme were formulated at a meeting of employers and employed which was held in London on July 27th last. At this meeting representatives attended from the National Association of Master Builders of Great Britain and Ireland, and thirteen of the various trade unions connected with the building industries. The chief lines of the proposed plan are as follows: A board of conciliation is to be established, the objects of which shall be to adjust by conciliatory means all questions relating to hours of labour, rates of wages and working rules generally, that from time to time arise, and may be referred to it by either employers or employees; and by mediation prevent strikes and lock-outs; and assist in the settlement of disputes that may take place in the building trades. This central board is to be composed of thirty members, half of whom are to represent the employers and the remaining half the work people. Local societies are also to be formed for the purpose of settling small disputes. An important section of the scheme is contained in the third rule, which reads as follows:—"In the event of a question arising between the trade societies with reference to demarcation of work, or in the event of any dispute arising between the members of a society or societies and the employers, and failing a settlement between the disputants locally, the question at issue shall be referred to the district committee; and, should this body fail to agree, the matter shall be referred to the central board, and, failing a decision on their part, the matter shall be laid before a board of disinterested referees, whose decision shall be binding on both sides. In all cases work shall go on without stoppage, pending a settlement. The committee to deal with the demarcation of work shall consist of three representatives of each trade affected, and three master builders.

Builders' Notes.

The hope of getting work on the Paris Exhibition buildings is, says the "Labour Gazette," a vain one, and workmen should not risk the journey.

Alleged Unlawful Erections.—At the South Western Police Court Mr. Garrett recently gave an important decision on a summons which the London County Council had issued against the Wandsworth and Putney Gas Company for unlawfully erecting a building which was within 20ft. of the highway. The point in the case was whether the common law over-ruled the private Acts of the company. The gas company was incorporated under three Acts, in one of which they were specifically "empowered to erect such buildings as they thought fit" on certain land scheduled in the Act. Accordingly, they had erected a new purifying house on the edge of their property. Mr. Daldy (for the Council) argued that despite the private Act the company were in the same position as a private landowner, and were amenable to the provisions of the Building Act. Lord Robert Cecil (for the gas company) contended that the private Act gave the company a specific exemption and cited several decided cases in support of his contention. Witnesses were called to prove that it was absolutely necessary for the supply of gas that the purifiers should be erected. Mr. Garrett, in giving his judgment, said he found as a fact that the new building was necessary in the sense that the company would be prejudiced in the supply of gas if they were not allowed to utilise the whole of their space. He dismissed the summons and ordered the payment of £10 10s. costs.

A Clacton Building Dispute.—At the Colchester County Court recently Mr. J. W. Martin, an auctioneer and surveyor carrying on business at Clacton-on-Sea, sought to recover from Mr. G. C. Ward, a London solicitor's clerk, £12 12s. paid on his behalf; as a counter-claim the defendant alleged damages to the amount of £30 19s. 1d. At the beginning of last year the defendant purchased a plot of land at Clacton, on which then stood two villas, and with the intention of having these reconstructed into a temperance hotel, he consulted the plaintiff, who afterwards prepared plans and the work proceeded. The plaintiff's claim of twelve guineas was for a pavement light he had put in at the request of the defendant. With regard to the counter-claim, the Clacton Urban District Council have a by-law which provides that every new domestic building shall possess in the rear an open space varying in size according to the height of the building. The point was whether the converted villas constituted a new domestic building. If it was not a new building, then the by-law did not apply at all, but the plaintiff contended that it was a new building, and he accordingly prepared and submitted plans to Mr. Robinson, the surveyor to the District Council, which provided for an air space of 20ft. at the rear. Defendant, however objected, on the ground that it was an old building, and directed plaintiff to prepare new plans. These plans showed 15ft. air space at the rear, and were approved by the Council, but subsequently it was ascertained that the builder, instead of leaving a space of 15ft. had only left 14ft. 3in., and the work had to be recommenced. At this juncture, Mr. Robinson declared that the building was not in accordance with the plans approved by the Council. This disclosed an amazing muddle in Mr. Robinson's office. The old block plan originally prepared by the plaintiff showing 20ft. air space, and the new section plan, showing 15ft. air space, seemed to have been pinned together by a subordinate in the office, and were actually produced by Mr. Robinson in subsequent police-court proceedings as the plans approved by the Council. Defendant denied having authorised plaintiff to obtain the pavement light on his behalf. Judgment was given for plaintiff on the claim with costs, and the counter-claim was adjourned until December 19th.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		BUILDING—		
Nov.	24	London, N.—Construction of Culvert	Wood Green Urban District Council ...	C. J. Gunyon, Surveyor, Town Hall, Wood Green, N.
,,	24	Southerndown, Wales—Rebuilding Hotel	....	Linton & Barker, Architects, Westgate-chmbrs, Newport.
,,	24	West Ham—Entrance Gates, &c., at Cemetery	Burial Board	M. Russell, 43, Broadway, Stratford, E.
,,	24	Skipton—Isolation Hospital	Rural District Council	G. E. Bolshaw, 189, Lord-street, Southport.
,,	25	Barry, Glamorgan—Alterations, &c., to School	County Council	T. M. Franklen, County Offices, Westgate-street, Cardiff.
,,	25	Blackburn—Buildings at Gasworks	Gas Committee	S. R. Ogden, Municipal Offices, Victoria-street, Blackburn.
,,	25	Bodmin—Additions to Infant School	School Board	W. J. Jenkins, Architect, Bodmin.
,,	25	Edinburgh—Alteration, &c., to School	School Board...	R. Wilson, 3, Queen-street, Edinburgh.
,,	25	Elgin—Villas	....	C. C. Doig, Architect, Elgin.
,,	25	Great Houghton, Barnsley—Stores, &c.	British Co-operative Society Limited ...	A. B. Linford, Architect, Carlton Villa, Wombwell.
,,	25	Plymouth—Destructor Buildings	Corporation	J. Paton, Engineer, Town Hall, Plymouth.
,,	25	Swindon—Stables, Coach House, &c.	....	W. H. Read, Architect, Corn Exchange, Swindon.
,,	27	Cirencester—Class Rooms at Grammar School	....	Vale & Kingsford, Bldg. Surveyors, Barton-st., Gloucester.
,,	27	Otley—Seventeen Houses	Leeds Industrial Co-operative Soc. Ltd.	Fairbank and Wall, 3, Manor-square, Otley.
,,	27	East Ham—Caretaker's Residence	School Board...	R. L. Curtis, 120, London Wall, E.C.
,,	27	Londonderry—Enclosure Walls, &c.	Corporation	City Surveyor, Guildhall, Londonderry.
,,	28	Brynmawr, Wales—Synagogue...	....	J. Isaacs, Pawnbroker, Bailey-street, Brynmawr.
,,	29	Kidderminster—Abutments, &c., to Two Bridges ...	Town Council...	A. Comber, Borough Engineer, Town Hall, Kidderminster.
,,	29	Gateshead—Additions to Higher Grade School... ...	School Board...	Oliver, Leeson & Wood, Architects, Mosley-st., Newcastle.
,,	29	Yardley—Boundary Wall and Entrance Gates	Burial Board	W. H. Lloyd, 38, Bennett's-hill, Birmingham.
,,	30	Lossiemouth, Scotland—Church Works	....	J. H. Glennie, Sec. New Established Church, Lossiemouth.
,,	30	Gedney, Lincs.—School...	School Board	R. H. H. Hand, Architect, Spalding.
,,	30	Halifax—Public Hall, Clubrooms, &c.	Liberal Club Company Limited	J. F. Walsh and G. Nicholas, Yorks. and Lancs. Back-chambers, Halifax.
,,	30	Penzance—Dry for China Clay	....	R. Godfrey, Civil Engineer, Penzance.
,,	30	Rotherham—Baths	Corporation	J. Platts, Architect, Rotherham.
Dec.	1	Idle, near Bradford—Brick Kiln	Blake Hill Quarry Company	W. J. Beall, 23, Bank street, Bradford.
,,	1	Otterbourne, Hants.—Workmen's Cottages	.. ..	Colson, Farrow, and Nisbett, 45, Jewry-street, Manchester.
,,	1	Wakefield—Additions to Cathedral	....	C. Leatham, Walsham How Memorial Fund, Wakefield.
,,	1	Alresford—Vagrant Wards, &c.	Union Guardians	W. H. Moss, Clerk, Workhouse, Alresford, Hants.
,,	2	Canterbury—Cricket Pavilion...	Kent County Cricket Club	W. J. Jennings, 4, St. Margaret's street, Canterbury.
,,	2	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
,,	4	Ilford—Retort House, Roof, &c.	Gas Company...	Engineer, Gas Works, Ilford.
,,	4	Horsham—School...	School Board	W. Buck, Architect, North-street, Horsham.
,,	5	Norwich—Isolation Hospital Extensions	Corporation	A. E. Collins, City Engineer, Guildhall, Norwich.
,,	5	Cowes, I. of W.—Police Station	I. of W. County Council	F. Newman, County Surveyor, St. Thomas-street, Ryde.
,,	5	Bexley—Infants' School	School Board	J. Ladds, 7, Doughty-street, Mecklenburgh-square, W.C.
,,	6	Sheffield—Stables, Cart Sheds, &c.	Highways and Sewerage Committee ...	C. F. Wike, City Surveyor, Town Hall, Sheffield.
,,	6	Cardiff—Operating Room at Infirmary	....	E. Seward, Architect, Queen's-chambers, Cardiff.
		ENGINEERING—		
Nov.	24	Pontefract—Electric Lighting of Workhouse, &c. ...	Guardians	G. R. Peers, 96, Deansgate, Manchester.
,,	24	Celbridge, Ireland—Pump Well	Rural District Council No. 2	F. Shortt, Clerk, Workhouse, Celbridge.
,,	25	Bakewell—Sewerage Works	Rural District Council	Sterling and Swann, Town Hall, Chapel-en-le-Frith.
,,	25	Glasgow—Landing-stages &c., for Steamboats	Corporation	J. M. Gale, 45, John-street, Glasgow.
,,	25	Burnham-on-Crouch—Sinking Well	Urban District Council	L. Dilliway, Clerk to Council, Burnham-on-Crouch.
,,	25	East Ham—Tramways	Urban District Council	W. C. Ullmann, The Limes, White Post-lane, East Ham.
,,	27	Bredbury—Gas Engines, &c.	Urban District Council	J. W. Bain, Clerk, School Brow, Bredbury.
,,	27	Felsted, Essex—Electrical Plant	School Governors	O'Gorman & Cozens-Hardy, 66, Victoria-st., Westminster.
,,	29	Kidderminster—Two Steel Girder Bridges	Town Council...	A. Comber, Borough Engineer, Town Hall, Kidderminster.
,,	29	Blackpool—Widening Promenade, &c.	Corporation	J. Wolstenholme, Borough Engineer, Town Hall, Blackpool.
,,	29	Knottingley—Sludge-Pressing Machinery, &c.	Urban District Council	Richardson and Le Maitre, 5, Central Bank-chambers, Leeds.
,,	30	Edinburgh—Talla Reservoir	Water Trustees	J. Wilson, 72A, George-street, Edinburgh.
,,	30	Dornoch, Scotland—Light Railway	Highland Railway Company	W. Roberts, Company's Engineer-in-Chief, Inverness.
,,	30	Port Elizabeth—Railway	....	General Manager of Railways, Capetown.
Dec.	2	East Kirkby, Notts.—Waterworks	Urban District Council	W. H. Radford, Engineer, Angel-row, Nottingham.
,,	4	East Dereham—Gas Engine, &c.	Urban District Council	B. H. Vores, Clerk, Theatre-street, East Dereham.
,,	5	South Mimms, Middlesex—Bridge Culvert	County Council	H. T. Wakelam, County Engineer, Guildhall, Westminster.
,,	6	Mallow—Waterworks	District Council	M. Regan, Clerk, Council Room, Mallow.
,,	12	London, N.E.—Refuse Destructors...	Hackney Vestry	R. Hammond, 64, Victoria-street, Westminster, S.W.
,,	20	Fishguard and Rosslare—Railways	Railways and Harbours Company ...	Sir B. Baker, 2, Queen-sq.-place, Queen Anne's-mansions, S.W.
		IRON AND STEEL—		
Nov.	25	Newcastle-upon-Tyne—Stores	Tyne Improvement Commissioners ...	Commissioner's Engineers, Berwick-street, Newcastle.
,,	25	Dublin—Railway Stores	Gt. Northern Rly. Co. (Ireland)... ...	General Stores Depot, Dundalk.
,,	25	Glasgow—Steel Rails	Corporation	J. Young, 88, Renfield-street, Glasgow.
,,	27	Dublin—Railway Stores	Gt. Southern & Western Rly. (Ireland)	Storekeeper, General Stores, Inchicore, Dublin.
Dec.	1	Warrington—Railway Stores	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
,,	2	East Kirkby, Notts.—Cast-iron Pipes	Urban District Council	W. H. Radford, Engineer, Angel-row, Nottingham.
,,	2	Manchester—Tramway Rails, &c.	Tramways Committee	J. M. M'Elroy, Secretary, Town Hall, Manchester.
,,	4	Wimbledon—Unclimbable Fence	Urban District Council	C. H. Cooper, Council Offices, The Broadway, Wimbledon.
,,	4	Swansea—Stores, &c.	Harbour Trustees	Engineer, Harbour Offices, Swansea.
,,	5	Dublin—Railway Stores...	Midland Great Western Railway Co. ...	General Stores Department, Broadstone Station, Dublin.
Jan.	6	Roscommon, Ireland—Water Mains...	District Council	C. Mulvaney, Engineer, Roscommon.
		ROADS AND CARTAGE—		
Nov.	24	Harwich—Street Works	Town Council...	H. Ditcham, 7, West-street, Harwich.
,,	25	Colchester—Levelling, &c.	Roads and Drainage Committee	H. Goodyear, Borough Surveyor, Colchester.
,,	25	Plymouth—Paving	Corporation	J. Paton, Borough Surveyor, Municipal Offices, Plymouth.
,,	28	Lewisham, S.E.—Kerbing and Tarpaving	Board of Works	Surveyor, Lewisham Town Hall, Catford, S.E.
,,	28	West Ham, E.—Making-up Streets	Corporation	J. G. Morley, Borough Engineer, Town Hall, West Ham, E.
,,	28	West Hartlepool—Materials	Corporation	J. W. Brown, Borough Engineer, Hartlepool.
Dec.	2	Worcester—Stone, Gravel, &c.	Corporation	T. Caink, City Engineer, Guildhall, Worcester.
,,	3	Chingford—Street Improvements	Urban District Council	W. Stair, 14, The Parade, Chingford.
,,	9	Worcester—Horse Hire, &c.	Corporation	T. Caink, City Engineer, Guildhall, Worcester.
,,	12	Cleethorpes, Grimsby—Road Works	Urban District Council	E. Rushton, Surveyor, Poplar-road, Cleethorpes.
		SANITARY—		
Nov.	25	Audenshaw, Lancs.—Removal of Night Soil, &c. ...	Urban District Council	T. Chorlton, Clerk, 2, Guide-lane, Audenshaw.
,,	28	Grange-over-Sands—Sewerage Works, &c.	Urban District Council	J. H. Ward, Surveyor, Council Offices, Grange-over-Sands.
,,	28	Upton-upon-Severn—Sewers, &c.	Rural District Council	G. H. T. Foster, Clerk, Public Offices, Upton-upon Severn.
,,	29	Sutton, Surrey—Sewers, &c.	Urban District Council	C. C. Smith, Surveyor, Public Offices, Sutton.
Dec.	2	Newcastle-upon-Tyne—Collection of Refuse	Sanitary Committee	City Engineer, Town Hall, Newcastle-upon-Tyne.
,,	4	Bournemouth—Sewers	....	F. W. Lacey, Engineer, Municipal Offices, Bournemouth.
,,	4	Leatherhead—Sewerage Works	Urban District Council	F. Beesley, 11, Victoria-street, Westminster.
,,	4	Hendon, N.W.—Sewerage Works	Urban District Council	S. S. Grimley, Public Offices, The Burroughs, Hendon.
,,	6	Morecambe—Sewerage Works	Urban District Council	Beesley, Son & Nichols, 11, Victoria-st., Westminster, S.W.
,,	9	Cheltenham—Sewerage Works	Corporation	Borough Surveyor, Municipal Offices, Cheltenham.
,,	11	Fulwood, Preston, Lancs.—Sewers, &c.	Urban District Council	W. Taylor, Engineer, Council Offices, Fulwood, Preston.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Nov.	25	Rye, Sussex—Sewerage Scheme	£25, £10	T. J. Smith, Clerk to Rural D. Council, Flushing House, Rye.
,,	30	St. Agnes, Cornwall—Water Scheme	£25	J. Angwin, Clerk to Parochial Committee, St. Agnes.
,,	30	Island of New Providence, Bahamas, West Indies—Public Market.	£40, £10, £5	Civil Engineer to Board of Public Works, Nassau, Bahamas, *viâ* New York.
Dec.	1	Bury, Lancs.—Infectious Diseases Hospital	£100, £50, £25...	Borough Engineer, Corporation Offices, Bury.
,,	1	Roanoke, Va., U.S.A.—Brick and Stone R.C. Church ...	....	J. J. Garry, Roanoke, Va., United States.
,,	15	Lymm—Council Chamber and Offices	£25, £15...	W. Mullard, Clerk to Urban District Council, Lymm.
Jan.	31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.
Mar.	12	Belfast—Assembly Hall...	£100, £50, £25...	W. D. Eakin, 12, May-street, Belfast.

Property and Land Sales.

FREEHOLD BUILDING LAND to be LET on LEASE, or SOLD in PLOTS; fronting on main road, and close to golf links and Highgate Woods near Muswell Hill and East Finchley Stations. Liberal advances if required to responsible Builders.—For plans and particulars apply to Mr. George H. Paine, Architect and Surveyor, 6, Stoke Newington Road, N. 11

By direction of Messrs. Dawson and Co., who are removing to Mendip and Durham Wharves, in consequence of their premises being required by the Vestry.

WEATHERALL and GREEN will SELL by AUCTION at Falcon Wharf, Battersea, on MONDAY, NOVEMBER 27th, 1899, at TWELVE o'clock precisely the surplus STOCK of BUILDING MATERIALS, comprising stock and facing bricks, slates, ridge, hip, and roofing tiles, quarries, sinks, chimney pots, drain pipes, gully, and other sanitary goods, forge and anvil, travelling steam crane and railway, and sundry office fixtures and fittings.—Catalogues on the premises, and of the Auctioneers, 22, Chancery-lane. 1

To Architects, Builders, and Investors. — City of London.—To be Let on Building Lease, with option to buy the freehold, very valuable building sites in the new centre of commerce formed by the thoroughfare known as Lloyd's-avenue, leading from Fenchurch-street to Crutched-friars, where already important plots have been disposed of and are now in course of development.

MESSRS. JONES, LANG, AND CO., are instructed to offer by AUCTION, at the Mart, E.C., on THURSDAY, NOVEMBER 30th, 1899, at TWO o'clock, in Lots, to be let on Building Lease for 80 years, the very important and valuable BUILDING LAND, in Lloyd's-avenue, Fenchurch-street, City of London, ripe for immediate development, as follows:—

Plot of land, frontage 80ft. to Lloyd's-avenue, area 8,160ft.

Plot of land, frontage 60ft. to Lloyd's-avenue, area 13,240.

Plot of land, frontage 60ft. to Lloyd's-avenue, area 9,270ft.

Plot of land, frontage 57ft. to Lloyd's avenue, area 5,350ft.

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Messrs.

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Thursday, Nov. 23
Thursday, Dec. 7
Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

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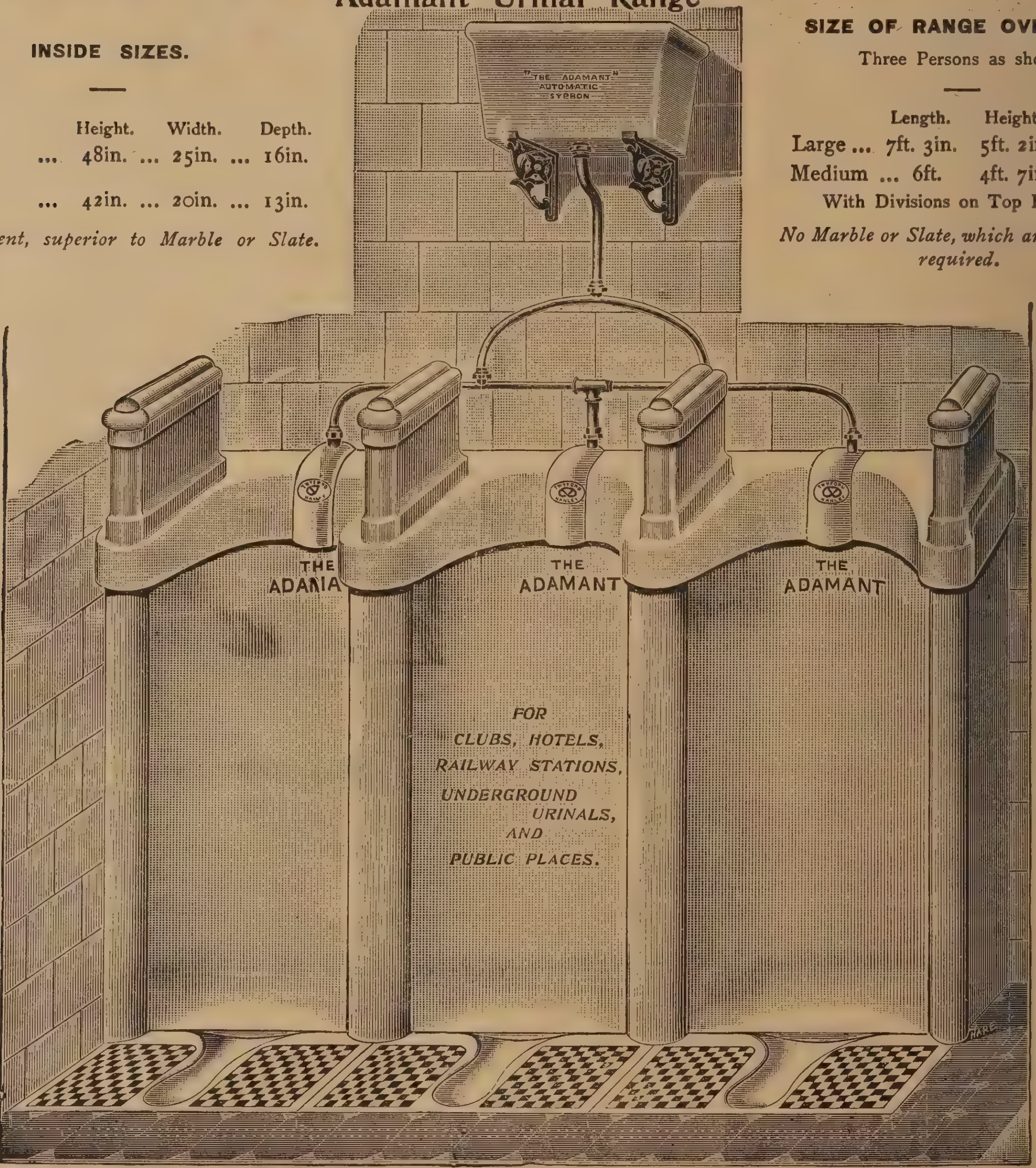
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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS.

NOVEMBER 29, 1899.
No. CCLI.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

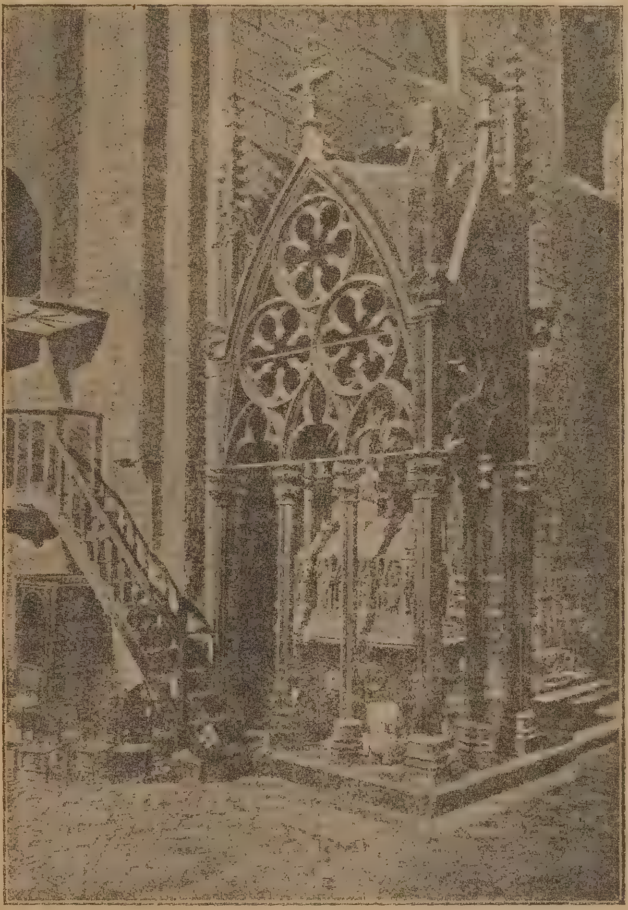
An Architectural Causerie.

The Cupolas of London. THE pride of London is the great cupola of St. Paul's. It dominates the ancient city, enters into every view, and refuses to be hidden even by the vast modern buildings which have arisen all about it. The situation is unrivalled—the summit of a small steep hill—and emphasizes it to the utmost. In spite of its size, lightness and grace are its chief characteristics; in these it excels St. Peter's at Rome, which suggested the design, and it is further distinguished from it by a magnificent ring of columns, standing out as vertical lines of light against a dark recessed background. Its construction is exceptional; it is vertically triple; an inner vaulted dome of brickwork covers the centre of the church, and is the one seen from within; above this rises a *cone* of brick, which carries the lantern, with its "golden gallery," ball, and cross; outside all is the external dome. It is of wood, covered with lead.

The other churches, rebuilt after the Fire, exhibit many combinations of tower and spire, but, with the exception of St. Stephen's, Walbrook, no dome; and London in the larger modern sense possesses but a very limited number of cupolas. In this it again contrasts with Rome, which is a city of domes; there are more than 350 churches, most of them domed. Of the other cupolas of London two alone are of any importance. One is at Bethlehem Hospital; it rises over the centre of a long façade with an immense garden in front; seen from the South-Western Railway, near Vauxhall, it suggests a little St. Paul's. The other is the cupola of University College, in Gower Street. The architect was Wilkins, a man who was badly treated in his day, whilst his reputation has suffered as much as that of Nash from hostile criticism. His college courtyard in Gower Street is spacious, the portico dignified, and the great stairs leading up to it very ingeniously disposed, though here, as in all cases where a dome rises over a portico, there is a certain sense of conflict between the two features for supremacy. The modern use of cupolas has not been at all happy. There is one rising over the new Admiralty buildings which resembles a distorted Mansard roof, and is perfectly amazing in its ugliness. Another spoils the view of Regent Street, and two more add bulk without beauty to the foot of the Haymarket. Cupolas should be used, where they are wanted, as a great central feature from without, or to cover a hall within; innumerable smaller examples are now rising in London, but, for the most part, they are wanting in grace, and inappropriate to their position. Nothing more effective, however, can be imagined, in towns, than cupolas, provided they be not "stuck on," but arise naturally from the design.

J. C. P.

Royal Tombs at Santas Creus. THE two monasteries of Poblet and Santas Creus, near Tarragona, were a veritable Campo Santo, in which most of the monarchs and nobles of Aragon and Catalonia had their burial places. The sepulchres of those who were buried at Poblet were violated in the revolutionary troubles of 1836, and their bones, having been scattered about the monastery grounds, were piously collected by Don Antonio Serret, the vicar of Espluga, the nearest parish, at considerable risk to himself, and, after reburial in his church for a time, now rest in the beautiful cloister of the cathedral at Tarragona and in the chapel of Corpus Christi: while the body of the great King James I., "El Conquistador," so called from his successful campaigns against the Moors, whereby Valencia and the Balearic Isles were wrested from them and added to his kingdom of Aragon, now occupies a tomb brought from Poblet, but not originally his, against the western wall of the *coro* in the nave of that building.


TOMB OF PEDRO III. OF ARAGON IN THE CHURCH OF THE MONASTERY OF SANTAS CREUS.

The remains of those who were buried at Santas Creus escaped the indignities offered to their companions in arms, and the tombs still contain their tenants. In the cloisters are numerous sarcophagi belonging to the great nobles, but the most noticeable monuments are the two which stand against the piers in the transepts of the church, one on each side of the nave. These are the sepulchres of the two kings—Don Pedro III., son of James I. of Aragon, and his son Don James II. We illustrate the former, which stands on the left and is a work of the end of the thirteenth century. The actual coffin is of red porphyry, and is said to have been a bath in the palace of the Moorish king of Majorca, though others say that it came from Sicily, a trophy of war brought by the great admiral Roger de Lauria. It rests on figures of crouching lions, and is covered with a well sculptured lid enriched with figures beneath canopies, the whole conceived in the manner of a shrine. The canopy beneath which it stands rests upon ten slender shafts of a speckled marble, the name of which escapes me, with carved caps, and consists of traceried circles fitted beneath the curve of an enclosing arch, while pinnacles rise from the corners, at the base of which the symbols of the Evangelists protrude like gargoyles.

The other tomb (of Don Pedro's son, James II.) is richer, but not so satisfactory, and the sepulchre itself is Renaissance in style, having been erected in the early part of the fourteenth century. The style of the sculpture of the canopies would be said to be a century later if occurring in England, and it is remarkable how extremely early Spain felt the influence of the Renaissance. The order for the making of this tomb is dated 1312, two years after the death of the Queen, and the King was buried by her side in 1327, a period when both France and England were in the full swing of Gothic developement and Germany had scarcely emerged from the Romanesque.

The epitaph to Don Pedro is worth quoting as showing what sort of men they were who fought the chivalrous and warlike Moors, and gradually pressed them back to the straits which they had crossed in the eighth century under the victorious commander Tarik, whose name still forms part of the name by which we know them. "Peter, whom this slab covers, subdued nations and kingdoms and cast down the powerful. He occasioned much noise, he realised all his designs, he made his soldiers bold and magnanimous, he who was first in war, now humbly lies here. Unalterable in his purposes, true in speech, loyal in his promises was he and valiant in arms. Governing strongly for equal justice to all he was praised by them, but his vigour of character was above all praise; he adored Christ by the way of repentance whence he received happiness. King of Aragon, Count and Duke of Barcelona, he died the 11th November in the year 1285. May the merciful Virgin Mary be his patroness and instructor."

F. H. J.

Taxing Works of Art.

The question of the Pacca Edict (a law demanding that a duty of 20 per cent. shall be paid on all objects of art exported from the Papal States) is interesting when viewed from an international standpoint. Whilst making no comment, I will simply limit myself to facts with regard to the recent action of the Italian Government in this matter, which will, I think, create a certain amount of surprise. The Diplomatic Corps at the Court of the King of Italy have frequently protested against the application of the 10 per cent. tax established by Article 14 of the Pacca Edict, April 7th, 1820, on objects of art exported by the representatives of foreign States. They sustain their right of exemption from this tax by virtue of the extent established in their favour in the preliminary dispositions of the customs tariffs. The members of the Diplomatic Corps opined that payment for the right to export objects of art should be included under the head of customs dues, from which ambassadors, and other foreign ministers, are exempt, not only with regard to goods they re-export, but also those which they have acquired during the term of their mission. The present Ministry have replied, however, that a distinction must be made between the customs tariff of 1 per cent. paid by exporters of objects of art at the frontier of the Italian provinces and the tax of 20 per cent. imposed by the Pacca Edict in the ex-pontifical provinces, which tax admits of no exception. The controversy which has been going on since 1885 has resulted in the question being taken up by the Minister of Foreign Affairs, who has, in turn, placed the matter before the Council of State. The decision of this Council at the sitting of January 1st last was as follows:—"That the tax of 20 per cent. imposed by Article 14 of the Pacca Edict, 7th April, 1820, shall be levied on all the goods therein indicated upon leaving the State, though they may belong to the members of the Diplomatic Corps."

Another cause of lively protest is the tax fixed upon objects of modern art of 2·50 lire (2s.) on goods valued at 2687·50 (£107 10s.) and under; and of 12·50 lire (10s.) if the value exceeds that amount. This tax was imposed in the ex-pontifical provinces by Pius IX. in his notification dated August 16th, 1848. The Minister of Foreign Affairs, in order to put an end to the dispute, had recourse a second time to the Council of State, enquiring if the maintenance of this latter tax be legitimate in view of the present condition of artistic legislation. The Council of State, however, at the sitting of February 16th last, was of the opinion "that the tax imposed on objects of art exported from the provinces forming part of the ex-pontifical states, in accordance with the notification of August 16th, 1848, has not been abolished, and, consequently, must still remain in force." This decision concerns also the tax on ancient objects prescribed by the same notification, of 12·50 lire (10s.) if the value exceeds 268·79 lire (£10 15s.), and 2·70 lire (2s. 2d.) if the value falls below that amount. An article on the Pacca Edict appeared in No. CCXVII.

Alfredo Melani.

On Reflection.

British Schools.

The British School at Athens has been so successful, and has proved itself of such utility, that it is now proposed to establish a similar school at Rome, a city whose associations and history make it eminently fitted to be the home of such an institution. The proposal is welcomed by the English residents in Rome, and has the cordial approval of Her Majesty's Ambassador to the Quirinal; it may be noted that Germany, France, Austria and America are already represented. As the Italian Government do not allow foreign representatives to make excavations, the school would be unable to do anything in this direction—which forms such a prominent feature of the sister school at Athens; but there is still a great field open to them in the regions of art, archæology and history. Next Spring it is proposed to issue an appeal for the two schools conjointly, for, in order to establish one at Rome, an initial outlay of £3,000 and an annual income of £1,000 would be required, as premises would need to be leased and, most probably, yearly studentships would be offered, as at Athens. Mr. Walter Leaf, of 6, Sussex Place, Regent's Park, N.W., is the honorary treasurer of the British school at Athens.

Commercial Art.

Art and Architecture are synonymous in object, and we therefore make no apology for referring in these columns to a question which, though brought forward in connection with a special work of art, has a very wide and important bearing. We refer to the controversy that has lately been going on in the columns of the "Times" about the late Sir John Millais' world-famous picture, "Bubbles." For those who have not read the various letters that have appeared it may be well to mention that the cause of the present dispute was the statement made by Mr. J. G. Millais, in the memoir he wrote of his father, that the latter had been very much annoyed by Messrs. Pears using his picture for advertising purposes. The picture was seen in Millais' studio by Sir William Ingram, who, being immediately charmed with it, bought it for the "Illustrated London News," by which paper it was used as a Christmas supplement, and enjoyed a very great popularity. Mr. Barratt (Pears' manager) says that he bought the picture from Sir William Ingram for £2,200, had a reproduction made of it, and showed a proof to Millais, who at once exclaimed: "That's magnificent," and later, after Mr. Barratt had mentioned the objection raised by artists that they ought not to paint for advertisers: "What nonsense. I will paint as many pictures for advertisements as you like to give me commissions for." Each side, of course, brings forward proofs, but as matters stand at present the question must remain a moot one, though from what has been stated we are ourselves inclined to believe that Millais did, at the time, favour the transaction. Putting aside, however, these particular facts, and using them only as a theme, what really should be the standpoint of the artist? Should he, under any circumstances, allow his works to be used for the purposes of advertisement? Great differences of opinion have always existed about this, and will probably remain; but (while not in any way wishing to advocate it as a common practice) surely in some cases an artist—or an architect for that matter—may sell his works to advertisers. Why are pictures painted at all? First, because the painter has a sense or inward feeling that compels him to put down on canvas, or paper, or what not a physical representation of what his mind has already conceived to be a reality. But there is another reason in the majority of cases, and one which must not be overlooked. The painter has to live, and to do so he must have money, and his pictures must therefore provide this for him Eminent painters have sold their works to pork packers and to retired grocers who were utterly devoid of any sense of true appreciation. What of these? Is this any worse than selling to an advertiser? For after all, though he buys for mercenary purposes, the public ultimately benefits. Posters and advertisements are now fixtures, and it were better that they should be beautiful rather than hideous. We see no objection in some cases to an artist—even a prominent artist—allowing his picture to be used in conjunction with an advertisement, and think that such a course would injure neither professional dignity (sometimes a supercilious element) nor the artistic ideal.

Architecture in America.

It is always interesting to know what one nation thinks of another, and also in what respect (or disrespect) the various ideas and works are held. For instance, it is interesting to hear what Herr Leopold Gmelin, the editor of "Kunst und Handwerk," has to say about the architecture of America. "The improved condition of Architecture in the United States since the close of the last decade has created a complete revolution in German professional architects regarding the status of America in this branch of Art." This he attributes to the fact that since 1882 a technical specialist has been attached to the German Embassy at Washington, whose reports have had great influence, and, particularly, to the Columbian Exhibition, which the president of the Royal Institute of British Architects recently described as "a work which was magnificent in effect, as all who saw it were agreed." Prior to 1873, the German architect regarded a trip to America for the purpose of architectural study as perfectly ridiculous, but now he thinks otherwise, and with regard to the "sky-scraper" Herr Gmelin says: "We may rejoice in the fact or deplore it accordingly as we incline to the mediæval or to the modern idea of life; but the fact remains that we have before us incontrovertible evidence of a most important cultural development." With this statement many will disagree, for though some of the larger buildings of America can and do demand our admiration, the prevalent style for ordinary houses is sadly incongruous and offending. The mixture of roofs, balconies arranged in most undesirable places, and, particularly, porches of hideous design—these do not tend to the production of a beautiful building. American architects have done much good work, no doubt, but they have also made a vast addition to the deplorable array of architectural abortions (to which our own architects have contributed largely), though the latter may have been everything that could be desired from a constructional point of view. As regards the sky-scraper, which is the outcome of scarcity of land coupled with high ground-rents in the cities, a long lease on the air may be a means of solving a difficult problem, but it does not lend itself to artistic building; and the result is that such buildings are altogether out of proportion and top-heavy. In conclusion we might refer to Mr. Hinkelduyn, the German technical attaché for many years at Washington, who designates American architecture as a happy union between internal utility and external effectiveness. We grant internal utility, but not the other factor.

DESIGNS FOR STAINED-GLASS WINDOWS.

By WILLIAM AIKMAN.

IN the design for the three-light window shown in the accompanying illustration, I have endeavoured to illustrate that at the foot of Christ's Cross all men meet as equals, and as He sacrificed all personal aggrandisement and shared His lot with all men, so must all men share their lot with Him. The soldier must for ever lay down his sword, the begger share his crust, the king his crown and sceptre, and the civic dignitary his office. The cross, which is material at the base where it touches the earth, becomes visionary higher up where it is lost in the brightness of the halo around Christ's head.

This halo is suggestive of the early morning sun, graduating in colour from white in the centre to rose colour in the doves, giving promise of the perfect day. The angels in the upper portion are recording the deeds of mankind on their apparently endless scroll. Growing out of the cross is the Tree of Life bearing its rich fruits, and around the top of the tree is the emerald rainbow, upon which the central recording angel is seated.

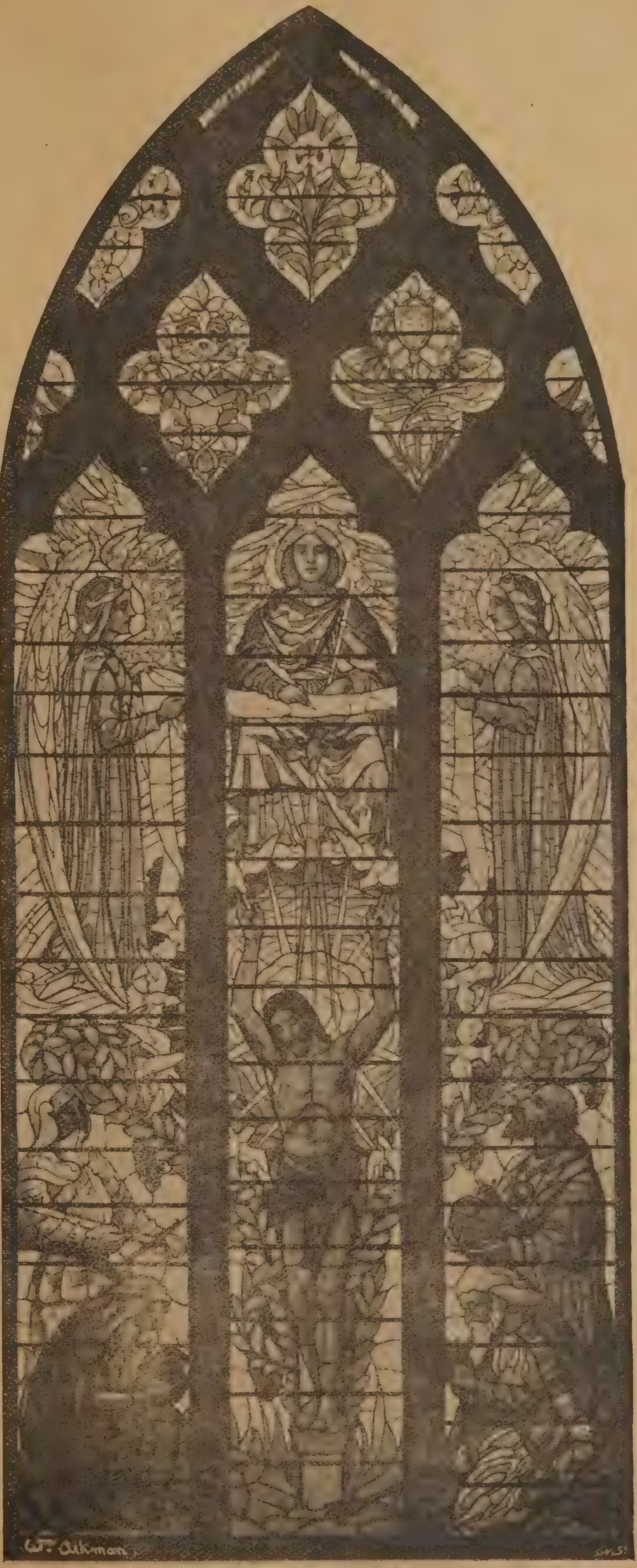
The subject of the two-light window is "The Queen of Sheba's visit to Solomon." In the left-hand light, Solomon is seen in the act of greeting the Queen from his great white throne, at the base of which are seated some of his councillors, while in the right-hand light the Queen is seen bowing to Solomon indicating the passage, "And behold the half was not told me" (Kings I., chapter 10, verse 7). The white throne is that referred to in the same chapter as being of ivory overlaid with gold and having the golden lions on each step. The Queen is surrounded by her attendants bearing her rich presents to Solomon.

The canopies, bases, and tracery are filled with a rich filigree of leaded ornament in place of the usual architectural detail; by this means I was able to carry the rich colour treatment over the whole window.

The "Moses at the Burning Bush" design is for a leaded glass window, the only painted portions being the flesh parts and the outline work on the tree.

I should now like to try to make clear what has always been my aim when designing for stained glass. The first purpose of a sketch for a window is to give a comprehensive idea of what the window will be like when executed, and although finish is not necessary, yet an amount sufficient to indicate little technical specialities peculiar to the designer is desirable. While making the design of the window in sympathy with the architecture of the building into which it is going, I hold that the modern material and appliances must not be over-ridden for the sake of imitative exactness of any given style or period. My observations of old glass tend to show that the craftsmen of the various periods made the most of the material and appliances they had instead of copying what had preceded them.

To paint elaborately one must use a rather flat and smooth-surfaced glass. Now, the finest glasses of modern manufacture are rough-surfaced, streaky, bubbly, and full of all manner of eccentric markings, thicknesses, and colours, which undoubtedly give great brilliancy and charm, but make them wholly unsuitable for imitative painting; and it is this very charming material that is always in my mind's eye when making a design for a window, and this knowledge of the material makes me trust so much to my leaded forms, so that the glass will require as little assistance from the paint as possible, although that little is often desirable. Then, even if the paint does come off, the window has lost only the least of its original charm.



"THE GREAT SACRIFICE": DESIGN FOR STAINED GLASS WINDOW. BY WILLIAM AIKMAN.

DISPUTED POINTS UNDER THE LONDON BUILDING ACT.

By GEORGE H. BLAGROVE,

Certificated Surveyor under the Act; Author of "Dangerous Structures," "Shoring and its Application," &c.

(Concluded from page 224, No. CCXLIX.)

VI.—EXEMPTIONS.

It would seem at first sight that Section 212, which exempts from the operation of the present Act all works to be carried out under contracts entered into before the passing of the Act, would become practically inoperative at a comparatively early date. In London most building contracts are entered into and completed within less than four or five years. But the interpretation of Section 212 depends upon what is deemed to be a contract within the meaning of that section. In the case of *Tanner* v. *Oldman*, it was held that the exemption applies not only to buildings to be erected under a contract with a builder according to definite plans and specifications, but also to buildings to be erected under an agreement for the development of a building estate. The principle here laid down gave a much wider scope to Section 212 than had been anticipated, and has enabled many buildings in the county of London to escape the restrictions of the Act of 1894.

The Question of Exemption and the Question of Use.

Under Section 201, numerous buildings and works are exempted from the operation of Parts VI. and VII. of the Act; but the exemption, in the majority of cases, will be found to depend upon the uses to which the respective buildings or works are applied. In the case of *Coole* v. *Lovegrove* it was held that a building erected by a canal company upon one of their wharves, and let by them to an institution for distributing firewood, was not "used for the purposes of the canal" within the meaning of Section 6 of the Metropolitan Building Act, 1855. That section, although repealed, is substantially re-enacted in Section 201 (8) of the Act of 1894.

Some buildings and works, not specifically mentioned in the Act of 1894, but exempted under private Acts from the operation of former Building Acts, are generally exempted also from the operation of the Act of 1894, under Section 218. The recent case of *London County Council* v. *The Crystal Palace Company* was a case in point. Section 21 of the Company's private Act, 1881, exempted the "main building, conservatories, and waterworks of the Company, and the conveniences and other works immediately connected therewith," from the operation of Part I. of the Metropolitan Building Act, 1855; and this exemption was held to be kept alive by Section 218 of the Act of 1894. The case was otherwise interesting from the question raised as to the meaning of the words "immediately connected therewith." It was held that, in order to claim the benefit of the exemption, the "conveniences or other works" need not be structurally attached to the main building or its conservatories or waterworks, but need only be closely appurtenant to them, or required for use as adjacent appendages. But it was also held that certain detached polo stables situate about a quarter of a mile from the main building could not rank as "other works immediately connected therewith." It is understood that this case will be the subject of an appeal.

Should Notice be given to the District Surveyor?

Some builders appear to be of opinion that it is not necessary to give notice to a district surveyor in respect of buildings and works specified under Section 201. This, however, by no means follows as a matter of course; for that Section exempts such works only from the operation of Parts VI. and VII. of the Act, whereas Section 145, which requires notice to be given before a "building, structure, or work" is begun, comes under Part XIII. Presumably a district surveyor could not require notice of any work in connection with bridges, piers, jetties, &c., nor in connection with public buildings, such as the Mansion House, Guildhall, or the City buildings of the Bank of England. But he could require notice in respect of domestic buildings under Part V.; and it is just conceivable that a building within the station premises of a railway company, inhabited by an official of the company, might abut upon a street, and so come within Section 41. But apart from any such conceivable case, there are instances under Section 201 of partial or conditional exemption, in which it would clearly be the duty of a district surveyor to see that the limits of the exemption were observed, or that its conditions were complied with.

For example, greenhouses, under (15), are exempted, if not attached to other buildings. But if a greenhouse is to be erected, the district surveyor must take cognisance of it so far as to satisfy himself that it is intended, *bonâ fide*, to be used as a greenhouse; and a written statement by way of notice affords documentary evidence of such intention. Also, the surveyor must see that the erection of the greenhouse does not contravene any other provision of the Act. It must not, for instance, be erected above the pavement level in the space required under Section 40, nor above the horizontal line in the space required under Section 41. Also, if it were erected within 4ft. of a party wall, the wall would, presumably, have to be raised, if necessary, above any part of the roof within that distance, in conformity with Section 59 (2); for although the greenhouse would be exempted from the operation of that Section, the party wall would not. Surely, if a district surveyor is to consider such points as the foregoing, he is entitled to demand a notice and to claim a fee. Greenhouses, if attached to other buildings, undoubtedly require notice, because they are

"MOSES AND THE BURNING BUSH": DESIGN FOR STAINED GLASS WINDOW. BY WILLIAM AIKMAN. (*See p.* 253.)

exempt only so far as the necessary woodwork of the sashes, doors and frames; and of course the district surveyor must see that no other woodwork is used in their construction.

Works Totally Exempt from the Act.

Some works not specifically mentioned in the Act are exempt from all its provisions; but many of these are difficult to define, and some of them have been subjects for dispute. For examples, in the case of *Venner* v. *M'Donell*, it was decided that movable seating, consisting of tiers of wooden platforms, erected in the Agricultural Hall, Islington, is not a "building, structure, or work," requiring notice to a district surveyor under Section 145. This is a case which should be very cautiously applied as a precedent, for the Court refused to define "structure" once for all in the Act, and dealt only with this particular case under Section 145.

In three cases certain works were held not to be "wooden structures or erections" requiring licences from the London County Council under Section 13 of the Metropolis Management and Building Acts Amendment Act, 1882; and as this Section has been substantially re-enacted in Section 84 of the London Building Act, these cases still have an interest for us. In *Hall* v. *Smallpiece* the exemption was held applicable to a steam roundabout and shooting gallery. In *London County Council* v. *Pearce*, a wooden building on wheels, used as a builder's foreman's office and as a pay office in the builder's yard, after working hours, was exempted. Section 84 (2) expressly exempts "any wooden structure of a movable or temporary character erected by a builder for his use during the construction, alteration, or repair of any building;" but use as a pay office is not obviously implied here. In *London County Council* v. *Humphreys, Limited*, a bungalow constructed of wood and corrugated iron was exempted, while exposed for sale, and not used or occupied on the spot where it was erected. Evidently such a structure would come under Part VII. of the Act, after it had been purchased and re-erected for use anywhere in the county of London, unless under the conditions specified in Section 201 (10) (11) and (12).

What is a Sky Sign?

In Part XII., Section 127 prohibits the erection of any sky sign; and all licences granted under Section 129 for the maintenance of pre-existing sky signs expired on or before the 24th of August last, and cannot be further renewed. No sky sign, therefore, can now be permitted to exist. It would, however, be interesting to know what species of trade signs are exempt from the operation of Part XII. I have, in a previous article, referred to some trade signs which appear to be projections within the meaning of Section 73. These, however, if coming within that Section, might be maintained by consent of the Council; whereas that body would have no power to sanction the maintenance of a sky sign.

The term "sky sign" is defined in Section 125, and may be stated briefly to mean any device in the nature of an advertisement, attached to any support, "wholly or in part upon, over, or above, any building or structure, which, or any part of which, sky sign shall be visible against the sky from any point in any street or public way, &c."

There are advertisement signs, frequently constructed of open metal work, which project from the fronts of business premises, overhanging the public footway, and distinctly visible against the sky. Are these sky signs within the meaning of Section 125? Being affixed to the fronts of buildings, they cannot be said to be "over" or "above" any building, but are they not "upon" buildings? The question is an important one, because any kind of structure projecting over the public way may easily constitute a public danger.

Chelsea Hospital has had additions and improvements made to it, which have cost £3000. The operating theatre on the third floor has been enlarged, new sterilising and anæsthetic rooms have been provided, and a lift, electric light, and a new hot-water service have been installed.

"THE QUEEN OF SHEBA'S VISIT TO KING SOLOMON": DESIGN FOR STAINED GLASS WINDOW.

(*See p.* 253).

MR. JAMES F. PARKER.

BUILDERS' BENEVOLENT INSTITUTION.

THE fifty-second annual dinner of the Builders' Benevolent Institution took place on Thursday night, the 23rd inst., in the Carpenters' Hall, Throgmorton Avenue, E.C., when the president, Mr. Alfred E. Parker (of Messrs. Patman and Fotheringham, and a member of the Builders' Institute) occupied the chair. He was supported by Messrs. J. Howard Colls, S. Young, W. Woodward, J. F. Parker, H. Bartlett, A. Lucas, B. Ellis, R. Cooper, the Master of the Carpenters' Company, Professor Roger Smith, Hilton Nash, A. Ritchie, C. Bussell, T. Stirling, J. T. Bolding, and others, the company numbering about 160 in all.

It might be mentioned that this Institution was established in June, 1847. According to last year's report, there were twenty-three men pensioners of from 66 to 82 years of age, and twenty-two women from 62 to 84 years of age. Altogether, some 161 men and 122 women have been supported by the Institution for terms of from 1 to 2 up to 10, 11, 14, 19, 21, 24, and 26 years. In these days of many funds, deserving institutions of this nature should not be neglected. Every builder, small or great, should be a subscriber. Even half-a-guinea, given in the hope that it would assist to make cheerier the declining days of some aged colleague or his widow, would be most acceptable; besides days of adversity come to the most prosperous, and if one ever required to solicit the aid of the institution he could do so with more grace, if he could look back to the time when he himself was a willing and cheerful supporter of it. Subscriptions and donations forwarded to Major Brutton, secretary, 35, Southampton Row, will be gratefully acknowledged.

The firm of Messrs. Patman and Fotheringham, of Park Street, and Theobald's Road, W.C., with whom the president is associated, as mentioned above, is one of the oldest in the London building trade. It dates back quite 150 years. Messrs. James Fotheringham Parker and Alfred E. Parker are the present managing partners. Mr. R. S. Parker was the sole partner for thirty years, and his two sons, now managing the business, have had full control of it during the last ten years. Among the buildings in London which the firm have built are the Shaftesbury, Savoy, Palace, Drury Lane, and Tivoli Theatres, Pawson and Leaf's buildings (opposite St. Paul's), and the Queen's Hotel, Leicester Square; while in the country they have done a vast amount of work.

The president gave the toast of "Her Majesty the Queen and the Royal Family," which met with a loyal reception. Mr. Arthur Lucas gave "The Army, Navy, and Auxiliary Forces," to which Major Brutton (the secretary) and Lieutenant Clarke replied. The president proposed the toast of the evening—"Success to the Builders' Benevolent Institution." He said that no severe criticism could be applied to this charity, which was open to all members of the trade, provided that the applicant for relief had always held himself as an honest man. At present there were fifty pensioners on the funds, the men receiving £39 per annum, and the women £27. The committee hoped to be in a position in the coming year to elect all the applicants without putting them to the trouble of an election. Being a young man he looked upon the position he occupied that evening as a great honour, and he hoped that there would be a generous response to his appeal for funds for this most deserving charity. The toast was received with acclamation.

Mr. Basil Ellis gave the toast of "The Worshipful Company of Carpenters." It was a great advantage to have that historic hall for their gathering, and to be associated with a Company so closely allied to the trade. The Corporation and the City Companies had had a great and glorious past, and there was no reason why they should not be even more powerful in the future.

Mr. Arthur Jacobs (the master), in responding, expressed the pleasure the Company derived in giving the hall for such a worthy object.

Mr. J. Howard Colls proposed the health of "The President." Although Mr. Parker was a young man, he was a model president, and he took some credit for having been his *entrepreneur*. The building trade he would add was a somewhat precarious one, in which the percentage of losses was great and the responsibilities unending, and an institution like this was necessary for those who fell out by the way.

The president, in responding, spoke of the great assistance he had received from Major Brutton, Messrs. Stirling, Bolding, Bussell, and others he could name.

Mr. R. Cooper (master of the Distillery Company) gave the toast of "The Architects and Surveyors." Like good soldiers they fought for the health and benefit of the community at large, and it was to them that the public looked for wholesome houses and good sanitation.

Mr. W. Woodward, in replying for "The Architects," said that wherever there was friction between them and the builders, it was caused by a desire to do the best they could for all sides.

Mr. Sidney Young responded for "The Surveyors," adding that the Quantity Surveyor could produce better effects by his pen than by his tongue. He believed, too, that they had the confidence of the London builders.

Dr. Street gave the last toast, "The Vice-Presidents, Committee and Stewards," to which Messrs. Alexander Ritchie and J. T. Bolding suitably replied.

Major Brutton in the course of the evening announced subscriptions amounting to £959, of which the president's list represented £800, including his own donation of 100 guineas. The president added later that through the kindness of a friend the amount would be raised to £1,000.

An excellent selection of music was given, including several piano solos by Signor Tito Mattei, who attended as a guest of the president.

A curious lease is that of Wolsey's Palace in Fleet Street, as, in the event of the house being demolished, it requires that it shall be replaced to a building of exactly the same weight.

The London Statue of Mr. Gladstone.—The Improvements Committee of the London County Council decided, at their meeting on Wednesday, to recommend the Council to allot a site on the new street from Holborn to the Strand to the Gladstone Memorial Committee, for the erection of the national statue to Mr. Gladstone.

MR. ALFRED E. PARKER.
(President of the Builders' Benevolent Institution.)

SOCIETY OF ARCHITECTS.

PRESIDENT'S ADDRESS.

THE first ordinary meeting this session of the Society of Architects was held at St. James's Hall, Piccadilly, on Thursday last; the president, Mr. T. Walter L. Emden, J.P., L.C.C., occupied the chair. After the minutes of the last meeting had been read and confirmed, the following gentlemen were elected:—As associate: Prof. Bhise Shanker Abaji, Bombay. As members: Messrs. E. Archer, London; J. M. Billimoria, Bombay; F. W. Chancellor, Chelmsford; J. P. Crosby, Rickmansworth; J. P. Earle, Sheffield; A. Gorton, Morecambe; D. H. Mirza, Bombay; E. C. P. Monson, London; R. B. Martin, East Ham; J. H. Martindale, Carlisle; H. W. H. Palmer, London; J. Slack, Carlisle; and A. G. Ware, Bournemouth. As student: Mr. T. Falconer, London. In moving the adoption of the annual report and balance sheet, the chairman was glad to say that the increase made in the annual subscription had caused only a few resignations, and he had great confidence that next year the Society would have a considerable balance in hand. He then read his inaugural address.

In again drawing attention to the question of Registration, he wished particularly to impress its importance on provincial architects, as they were most open to the competition of the incompetent and unqualified man. He hoped with the increase of the subscription that many more meetings would be held to spread information on the question than had been possible in the past. In his opinion Parliament must sooner or later protect the public from incompetent, uneducated, and ignorant persons who can and do enter the profession freely and without let or hindrance. With regard to the law relating to light and air, the proposals of the Society would not (though feared otherwise) interfere in any way with the rights of property, but would rather help to protect them, while they would save wasteful and useless expense, and the production, often enough, of disfigurement in our streets.

Referring to the London Government Act of this year, he thought that the course which might fairly have been taken was that the municipalities should have had placed in their hands all the powers which were not absolutely necessary to remain in the hands of a central authority, who should make the by-laws and deal with such questions as main drainage, fire, water, metropolitan improvements, dwellings for the poorer classes, &c., which must be common to the whole of the metropolis. Architects and surveyors would appreciate what he said when he stated that the requirements with regard to building under the present system (or rather want of system) were complicated and overlapping, and that even while in a provincial city it was possible to pass one set of plans, and go only to one authority, in London plans had to be deposited in almost unending succession and with several authorities. When legislation did come about, the Bills were more or less framed by men who had little or no practical or technical knowledge of the questions they dealt with. He thought, therefore, for these and many other reasons, an extremely useful work on the part of the Society would be to try and bring about simplification and codification of the various Acts of Parliament affecting building operations. Even if a thorough codification could not be obtained, opportunity might serve to obtain minor improvements. He had before suggested the formation of a

Technical Court

as saving, in cases of light and air, delay, difficulty and expense; but such a Court might well go farther, and be appointed to try, at all events, certain classes of building cases. The uncertainty with regard to decisions under the present method, as well as its delays, left it not only unsatisfactory, but encouraged litigation, often enough for improper purposes. The Building Act Tribunal in London had proved itself satisfactory so far, and in such technical work as questions of light and air they ought to be, as a technical body, admirably adapted to give just and equitable decisions, and when this was accomplished and had proved satisfactory, then, with such modifications as might be necessary in its constitution, other classes of building cases might go to it.

A Retrospect.

There was one aspect with regard to architectural work which he might touch upon. We were now practically at the end of the nineteenth century, and, in fact, his term of office would be expended for the greater part in the first year of the twentieth century. It was only right, therefore, that he should look back, even if but shortly, at the advances which had been made in the work of the architect since the year 1800. Necessarily, a great deal of the advance came, as it would do, in the train of increasing wealth, as without this the work done could not be either as prolific, as good, or as carefully worked out; and there had been wealth at the command of the architect, for the country had vastly increased in wealth during the century.

At no period of Architecture, he believed, was style and design so debased as in the latter part of the eighteenth and the beginning of the nineteenth century. The squares of London and the rows of houses in many districts which date from that period spoke strongly in this direction with regard to our dwellings, and there were few great buildings of the period to which one could refer with pride. Certainly there was art still in some of the work—he referred rather to detail work—but even then he was of opinion it was poor and thin, and the general design of the interiors was often ill-considered and cold.

One of the best examples of modern architecture, and in his opinion the best example, as a whole, was the Law Courts at Brussels. He particularly considered these buildings good, because they were free from any tricks of art, and there was no attempt at over-ornamentation or of obtaining effect by it. It was the boldness and grouping which gave it its dignity, while the forcible nature of its design appealed to the thinking public to place it, as he believed they did, as one of the best buildings of the latter part of this century. But here in England we had also many buildings which spoke well for the great advance which had been made, and it was found not only in many of our public buildings, but in our great hotels, town halls, theatres, and other buildings; even our shops, and certainly our private dwellings, had made great advances, and the plain wall, with holes in it, had almost ceased to exist. Indeed, there was a strong feeling in London (which had been growing since the days when the old Board of Works commenced its great work of the Thames Embankment) that it should not only be the greatest and wealthiest of the cities of the world, but that it might also become one of the most beautiful. London had many advantages for such a claim; one was its river, another was the fact that the architect being free, and not hampered by the necessity of erecting great boulevards of similar elevation, produced buildings which, from the broken appearance they gave when grouped together, produced a pleasing and picturesque effect, which added much to the beauty of the city, and was far more pleasing to the eye than a more regular style could be.

The accommodation and luxuries of the small villas of to-day compared with the house of a similar class at the beginning of the nineteenth century so favourably that he had no doubt many who compared them wondered how their fathers or grandfathers ever lived in the way they did. The sanitary arrangements, baths, lighting, and a host of other attractions made the present villa a home which would have been envied could it have been seen or known of at the beginning of the century.

Great Improvements.

In no century of English history had such great strides been made. Great Britain itself had grown into the greatest empire the world had ever known. Its wealth had grown with it, and it certainly would be strange if art and architecture had not also. He was pleased to think that not only had the decorative portion of the architect's work made advances, but, what was so much more material, the sanitary part of his work had also equally advanced. When we remembered the many periods at which plague or cholera during the past century had attacked and threatened this country, it was certainly not only a relief, but a very great stride indeed, to know that the work of the sanitary authorities and the advance in the science of sanitation had almost closed the door to its recurrence, and to its consequent panic and fears.

He did not suggest that disease might not make some entry, but that it could not spread broadcast over the country under the sanitary regulations and appliances which were now insisted upon. It would be even more effectually prevented when provincial regulations were made more in accordance with, and more strictly administered with, those of the towns and cities of the kingdom.

No doubt considerable advance had still to be made, and there was room for it in the near future, but what he was interested to show at the moment was the vast difference there was for the better when we compared the state of this country as it is now, so far as this part of the architect's work was concerned, with what it was in 1800.

There was no doubt that during the same period invention and improvements had come upon us to such an enormous extent, and with such rapidity, that many things which would otherwise be considered great were dwarfed and lost sight of; still, but a little thought would show what strides sanitation had made. In the struggle for improvement he trusted that the question of sanitation would always be kept well to the front, as, whatever the wealth of the people, without health it was of little value.

In conclusion, he urged upon members of the profession, and of this Society in particular, that even if their influence, or the time that they could devote to the elevation of architecture and to deal with the questions he had referred to, were small, it was still a material help; not only from the point of view that every little helped, but from the fact that it showed that all were taking an interest; and nothing gave so much encouragement to those who were devoting their best energies to the work as to feel that all were taking this interest in it, and following and helping in the same direction.

In moving a vote of thanks to the chairman, Mr. Silvanus Trevail (vice-president) said the Council had taken great care to see that the qualifications of new members were kept up to a high standard. He regretted very much that those who at present had the drafting of Bills relating to buildings were so incompetent, and thought it was about time that the architectural profession had some influential representation in Parliament, for, since the death of Professor Banister Fletcher, it had none. It was a pity, he said, that the relations between their Society and the Royal Institute of British Architects were not more cordial, but he was of opinion that the latter elected themselves to a position which they were not entitled to take for the whole body of architects. Mr. Robert Walker, the ex-president, seconded the motion. The Registration Bill had been "hung up" in Parliament, and it was their duty to see that it was not strangled. The Bill had received, and was still receiving, great opposition from the Society in Conduit Street.

In the course of the meeting reference was made to the satisfactory way in which the honorary secretary, Mr. Ellis Marsland, and the new secretary, Mr. McArthur Butler, had performed their work.

Under Discussion.

ARCHITECTURAL PROGRESS IN LEEDS.

At the inaugural meeting of the Leeds and Yorkshire Architectural Society, held in Leeds on November 20th, Mr. W. Carby Hall, F.R.I.B.A., the president, said that though there were 367 architects in the Society's area, only fifty-nine were members, while of forty-eight members of the Royal Institute only thirty-six belonged to their society. Hull, for instance, was represented by only one. After commenting on the need for a decorative art museum as an aid to teaching, he expressed the hope that the sketching visits which had been started would result in the promotion of a School of Architecture in Leeds. The unfortunate matter of the bricklayers' strike, he observed, was that the architect saw his buildings practically at a standstill, and was the recipient of many unhappy visits from clients who, as a rule, thought the architect should rise superior to such mundane things as strikes. He hoped the time was not far distant when we should have a Government Labour Bureau, or some similar office, formed for the purpose of intervening at the outset of trade disputes, and thereby preventing the disturbance which under present circumstances ensued. In conclusion, he said he thought they could all thank the City Council for the spirited way in which the many needed improvements were being tackled. Looking back over the past few years it was marvellous to contemplate the progress which had been made in all parts of the city, and he was glad to see that the energy, resource, and enterprise shown by the authorities had produced the same qualities in the minds of the private citizen. It was a pleasure to see Leeds thoroughfares becoming, from an architectural standpoint, more worthy of the fifth city of England. The Society's silver medal goes this year to Mr. W. F. Copp, together with a prize of five guineas, while Mr. S. R. Whincup receives the sketching prize for a similar amount.

REQUIREMENTS OF REAL ART.

Mr. Stuart Carmichael said at Dundee last week, at a meeting of the Early Birds' Club, that art was the expression of an emotion impressed upon a sensitive organisation intensely enough to demand its utterance in line, form, or colour. The art quality could exist with very imperfect craftsmanship, and the spirit of art might live although it disregarded and abused the forms and conventions of art as now acknowledged. Give them drawings, paintings, sculptures, rudely if it must be, but sincerely executed, expressing true personal emotions, and they had a real art which reached the heart and touched the imagination. He who pursued this course was infinitely more the artist than the academic follower of past ideals. The critics, men of letters and of science, and the vast army of those who were incapable of forming an opinion on the aspect of modern art, held themselves as judges, and flung in the face of the artists of to-day the triumphs of the past, saying, "Not until you have reached the beauty of the Greeks in form, have shown yourselves subtler in rendering the mental expression of men and things than the great Gothic artists, rivalled the glory of Venetian colour, shall we adjudge you artist, and capable or likely to give us new sensations and revelations." The effect of this appalling and monstrous demand was that the generality of artists to-day were afraid of being themselves brow-beaten by this consensus of opinion to express not themselves, but pseudo Græco-Gothic anomalies.

AN APPRECIATION OF WILLIAM MORRIS.

The fourth of the lectures in connection with the Arts and Crafts Exhibition was delivered last Thursday at the New Gallery, Regent Street. The subject was "William Morris," and the lecturer was Mr. W. R. Lethaby. There seemed a special fitness in the choice of the subject on such an occasion, for Morris was a former president of the Arts and Crafts Society. The audience, it cannot be doubted, was largely composed of men and women who have been influenced by his work and teaching, and in a room adjoining the lecture hall was a unique collection of his works. The lecturer, too, was eminently fitted for his task, both by knowledge and by sympathy, as Mr. Walter Crane pointed out in introducing him. Mr. Lethaby's lecture was a frank and thorough-going appreciation of the great artist-craftsman; he disclaimed at the outset any attempt to give a judicial and critical study, humorously remarking that much that now passes for criticism in England consists in saying how much better a work of art would be if it had been carried out quite differently; his own attitude was that of a reverent admirer. Confining his attention mainly to the consideration of Morris as an artist, Mr. Lethaby gave a brief biographical sketch of his subject, laying special stress on those incidents in his life which affected his artistic development. The childhood on the borders of Epping Forest, when he read Scott's novels and rode his Shetland pony in the forest; the school-days at Marlborough when he spent his weekly holidays exploring old churches; the college days at Oxford, and the memorable friendships associated with them; the brief architectural apprenticeship in Street's office; the founding of the famous brotherhood which was to wage "a holy warfare against the age"; the building of the Red House at Bexley Heath—that "house of all the talents," which Rossetti described as "more a poem than a house"; the founding of the firm of Morris and Co.; all these episodes were passed in review with many suggestive comments.

On the subject of Morris's textile designs, a unique collection of which is to be seen at the exhibition, Mr. Lethaby was quite enthusiastic. In these patterns, he said, the colour was fair and pure, and always absolutely right; nothing was mineral or acid, and nothing was mawkish or morbid. The drawing was clear and elegant and strong—nothing was loose and vague; as in his written work, there was no finesse or rhetoric of design; all was quiet, inevitable, and great-minded.

Mr. Lethaby summed up Morris's teaching as consisting in the inculcation of four main doctrines: (1) The necessity for re-inventing our eyes, cultivating the faculty of observation as distinct from the mere print-reading faculty; (2) the value of work—mere manual work—in the training of a man as he ought to be; (3) the need for redeeming labour from being a curse by associating it with Art; (4) the need for love of and communion with Nature.

The lecture was distinguished by an admirable lucidity, and by occasional passages of genuine eloquence, with here and there a caustic epigram, generally at the expense of things modern: as, for instance, the description of much so-called "Art" as something which "smells of stuffy rooms, is limp with silly trifling, and stodgy with prejudice;" and the remark, that "the most recent realism would have the artist deal with such subjects as the Gasometer in a Fog."

Correspondence.

SOME SCANDALS OF LONDON STREET MANAGEMENT.

To the Editor of The Builders' Journal.

145, Gloucester Terrace, Hyde Park, W.

Sir,—It would be interesting to know by whose orders some of the main thoroughfares of the West-End are converted into rivers of mud at about eleven o'clock at night. At that hour the roads are flooded preparatory to cleansing, a plan which ensures that, never mind how dry the roads may have been until then, the heaviest traffic of the whole night (that caused by the rush home after the closing of theatres and other places of amusement) is forced willy nilly to plunge into a veritable mud bath. Pedestrians, vehicles, and horses are spattered all over with the filth, the removal of which means an immense amount of unnecessary extra work and expense to a large section of the public. The cleansing should, of course, be done an hour or two later, when the streets are practically deserted, or, as abroad, in the early morning.

The persons who have arranged the abovementioned state of affairs are possibly the same who manage to have roadways and pavements up during the busiest seasons of the year, and then allow two or three workmen to tinker for weeks at the job during the daytime only, whereas a sufficiently large gang should be insisted on for the daytime, with a similar one to relieve it at night. We might then be better able to tolerate the delay in providing the streets with underground passages to contain all pipes, wires, &c.

They are possibly the same persons, again, who have ruined the appearance of our handsomest thoroughfares by lining them with loathsome tin dust-bins, which do not hold the gravel they were designed (save the mark) to contain. The said gravel, having been deposited partly inside and partly outside these doddering monstrosities, is left there. When it is most required, in the event of *sudden* dampness or frost, no one is sent to spread it, and the horses are consequently allowed to suffer for hours with the remedy just in front of their noses.

The police will stand at a point where one horse falls after another, immediately in front of a sand box or heap, and will refuse to throw down a handful of sand themselves or ask a street-orderly boy to do so for them. Such is the lack of humane feeling and the strength of red tape. There are omnibus starting points on the treacherous asphalte paving situated on inclines, where common humanity should demand that gravel be constantly strewn. An unsightly heap of gravel will be found within an arm's length, but it is apparently nobody's duty to use it, except on one of those rare occasions when a hard frost sets in.

Sand-boxes and street-orderly boxes could surely take the form of covered traps sunk in the roadway or pavement, and very little mechanical ingenuity would provide an easy means of raising the contents above ground when desired.—Yours faithfully,

FRANK L. EMANUEL.

THE L.C.C. AND COVERED WAYS.

To the Editor of The Builders' Journal.

London.

Sir,—Seeing that you retain a staff who are willing to give information on constructional matters, I should be glad if they would relieve me from the anxieties of the following conundrum: Is a covered way or hood less dangerous to the general public when attached to a building fortified with a music and dancing licence?

You may be aware that the L.C.C. are refusing permission to erect such hoods even when confined to the projection of applicant's own door step, where there is no such licence, whilst licensed buildings are freely granted the necessary permit, even to the edge of the pavement.—Yours faithfully, W. I.

[The question can hardly be intended seriously. It is obvious that no licence can render a projecting hood more or less dangerous to the public than it would otherwise be. The London County Council can grant or refuse their consent to such structures under section 22 of the London Building Act, 1894; and it appears, from the recent case of *The Coburg Hotel Co. Ltd.* v. *London County Council*, that there is no remedy. It may be that the Council wish to limit the number of projecting hoods, as far as possible, with due regard to public convenience.—Ed. B. J.]

A RUSKIN SOCIETY.

To the Editor of The Builders' Journal.

Tunbridge Wells.

Sir,—With reference to the letter on p. 225, of your issue dated November 15th, there used to be some years ago a "Ruskin Society" in connection with the Westbourne Park Baptist Church (Dr. John Clifford, the pastor, being president.) I had a wish to join it, but, if I remember rightly, the reason why I did not was because the members used to hold their meetings early in the mornings, and living some distance away I was unable to attend.—yours faithfully, C. H. STRANGE.

[We know something of the society our correspondent refers to. It used to meet at seven o'clock in the mornings, but came to an end some time ago, not, we believe, owing to any lack of interest on the part of the admirable enthusiasts who composed it, but owing to the president's change of residence making it impossible for him to attend at such an early hour. Students of Ruskin's works who cannot find a Ruskin Society in their own neighbourhood might do worse than subscribe to "St. George," the excellent journal of the Ruskin Society of Birmingham. It is published quarterly, and may be obtained from the hon. secretary of the society, Mr. J. Howard Whitehouse, Bournville, Birmingham.—Ed. B. J.]

A palace to resist earthquakes is to be built for the Crown Prince of Japan from American plans. It is like a huge steel box, and cannot fall unless there should be a convulsion of sufficient force to turn it over bodily on one side. It will be shipped to Tokio in sections.

Wakefield Cathedral is to be extended as a memorial to the late Rev. Dr. Walsham How at a cost of about £20,700. Mr. Frank Pearson, of London, has prepared the plans. Among other alterations, the chancel is to be extended eastwards for 60ft., and a retro-choir is to be provided.

The Cathedral of St. John the Divine, New York, now being completed from designs by La Farge, will cost no less than two million pounds. £90,000 was paid for the site, £50,000 was spent on the foundations, and the choir will have alone cost £120,000. It is a Protestant cathedral.

The Holy Door of St. Peter's, Rome, will be opened by the Pope on December 24th, at midnight, to inaugurate the Holy year 1900. It will be sawn through on the inside and placed in an iron and wooden clamp, and, after the Pope has struck it with a golden mallet, will be lowered on to a car and carried away for preservation until the end of the year.

The Arts and Crafts Society of Ireland is now holding its second exhibition at the Royal University, Dublin. Amongst the exhibits are some stained-glass designs by Mr. W. J. Douglas, forming part of the decorative scheme for a hall, two wrought-iron gates by Messrs. J. and C. M'Gloughlin Limited, a pillar pedestal in Irish marbles by the Colles Marble Works, Kilkenny, and some specimens of terra-cotta and carved brick from the Lagan Yale Brick and Terra-cotta Works.

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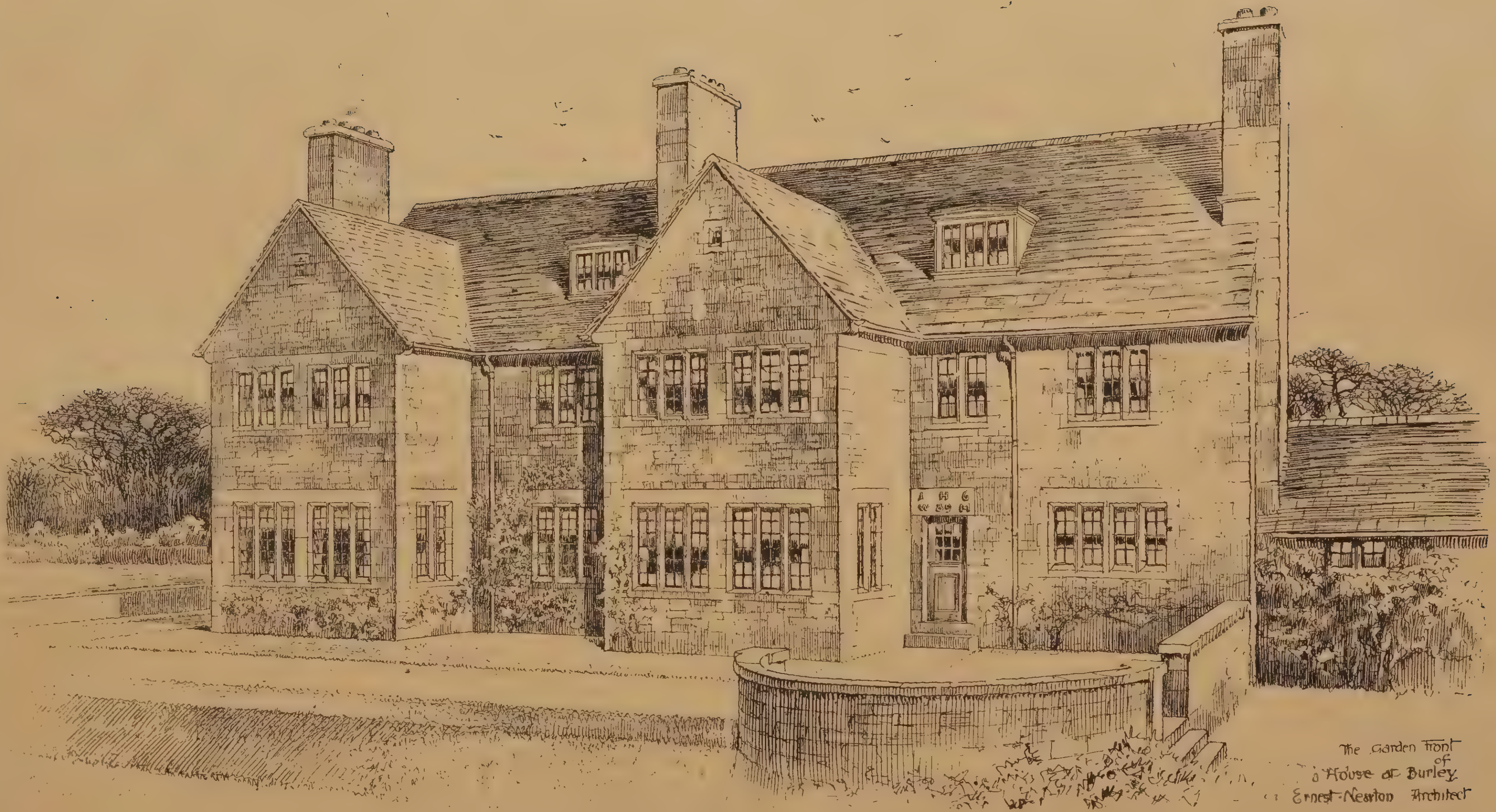

HOUSE AT BURLEY-IN-WARFEDALE, YORKSHIRE. Ernest Newton, Architect.

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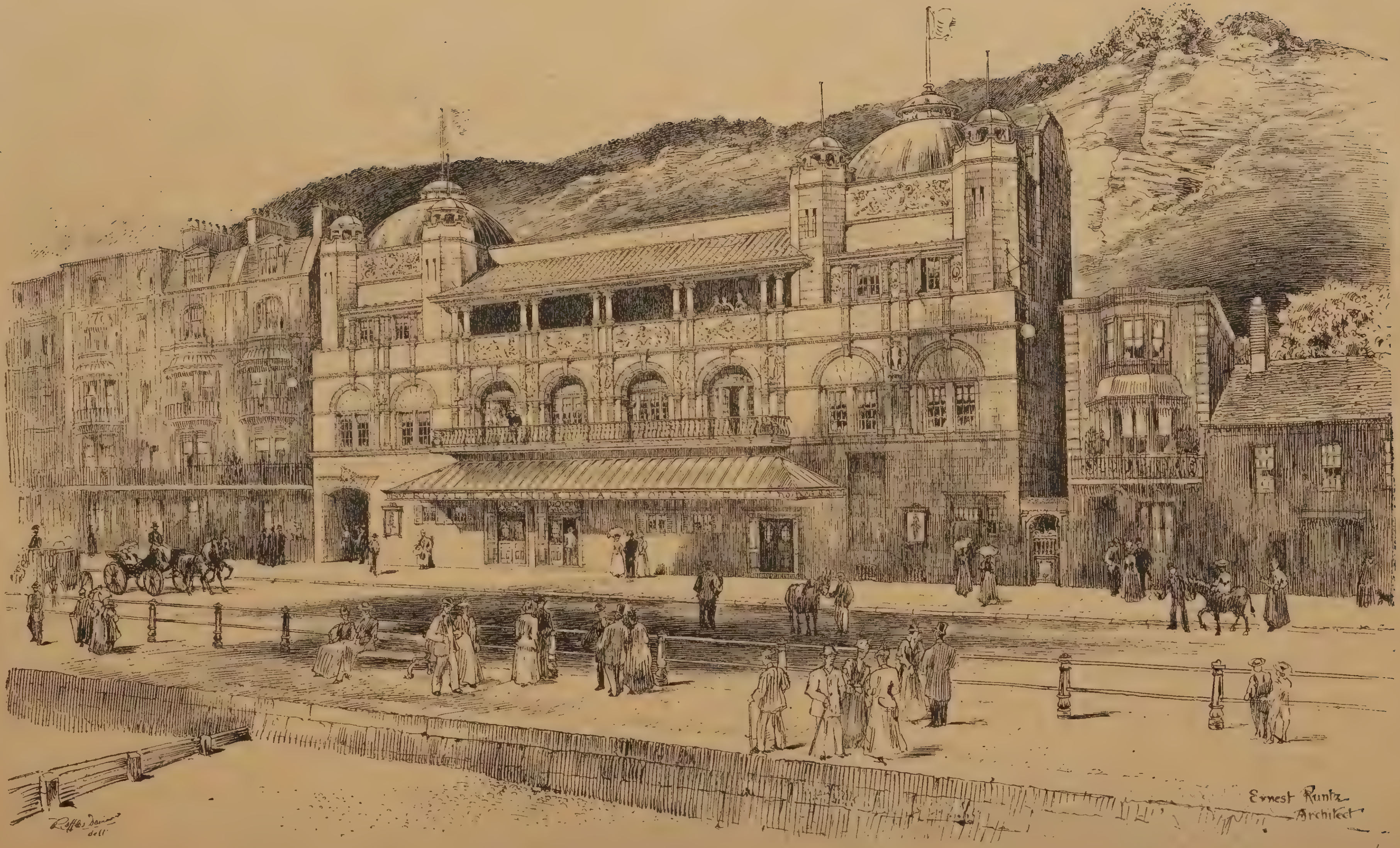

HASTINGS THEATRE OF VARIETIES. Ernest Runtz, Architect.

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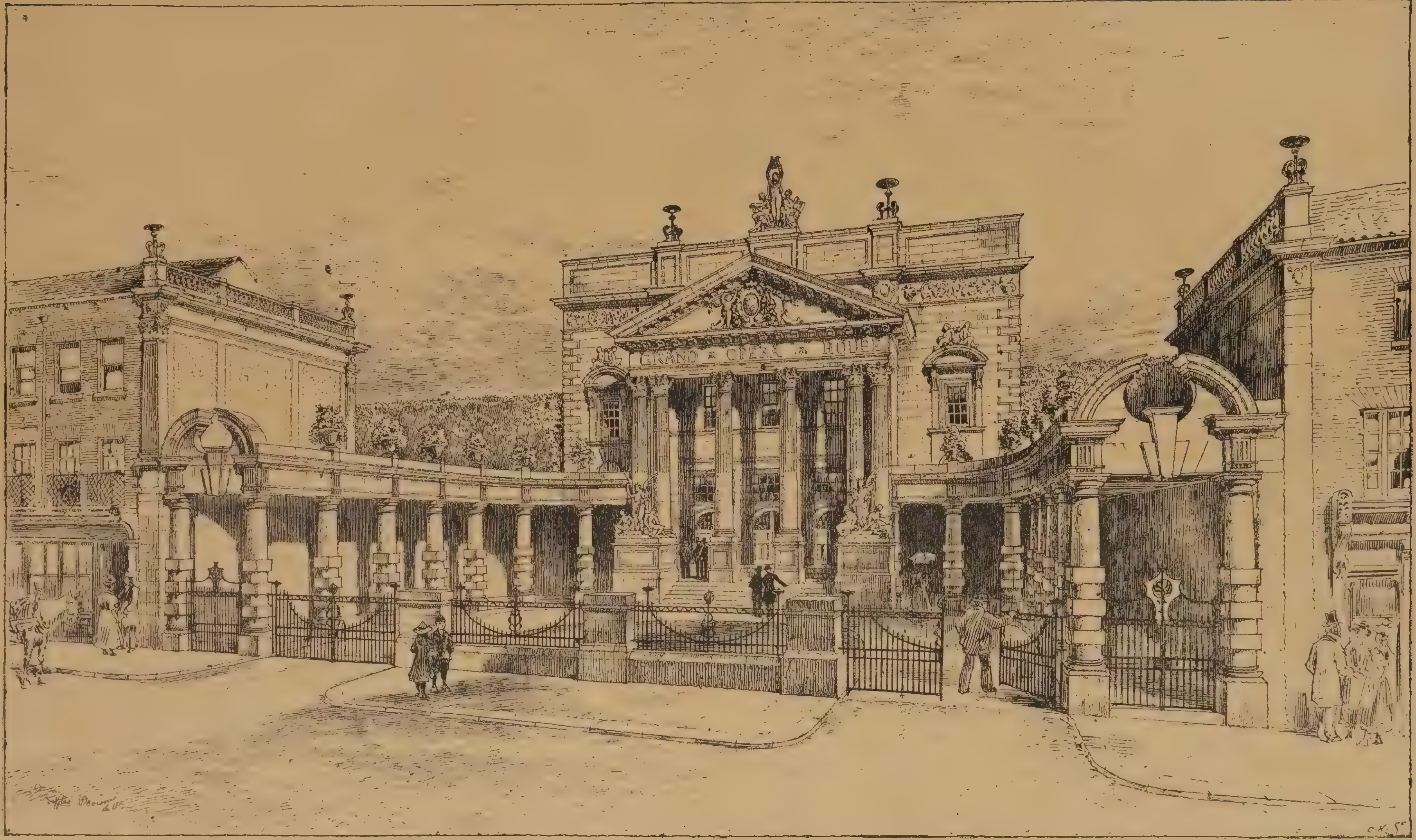

GRAND THEATRE AND OPERA HOUSE, NORWICH. ERNEST RUNTZ, ARCHITECT.

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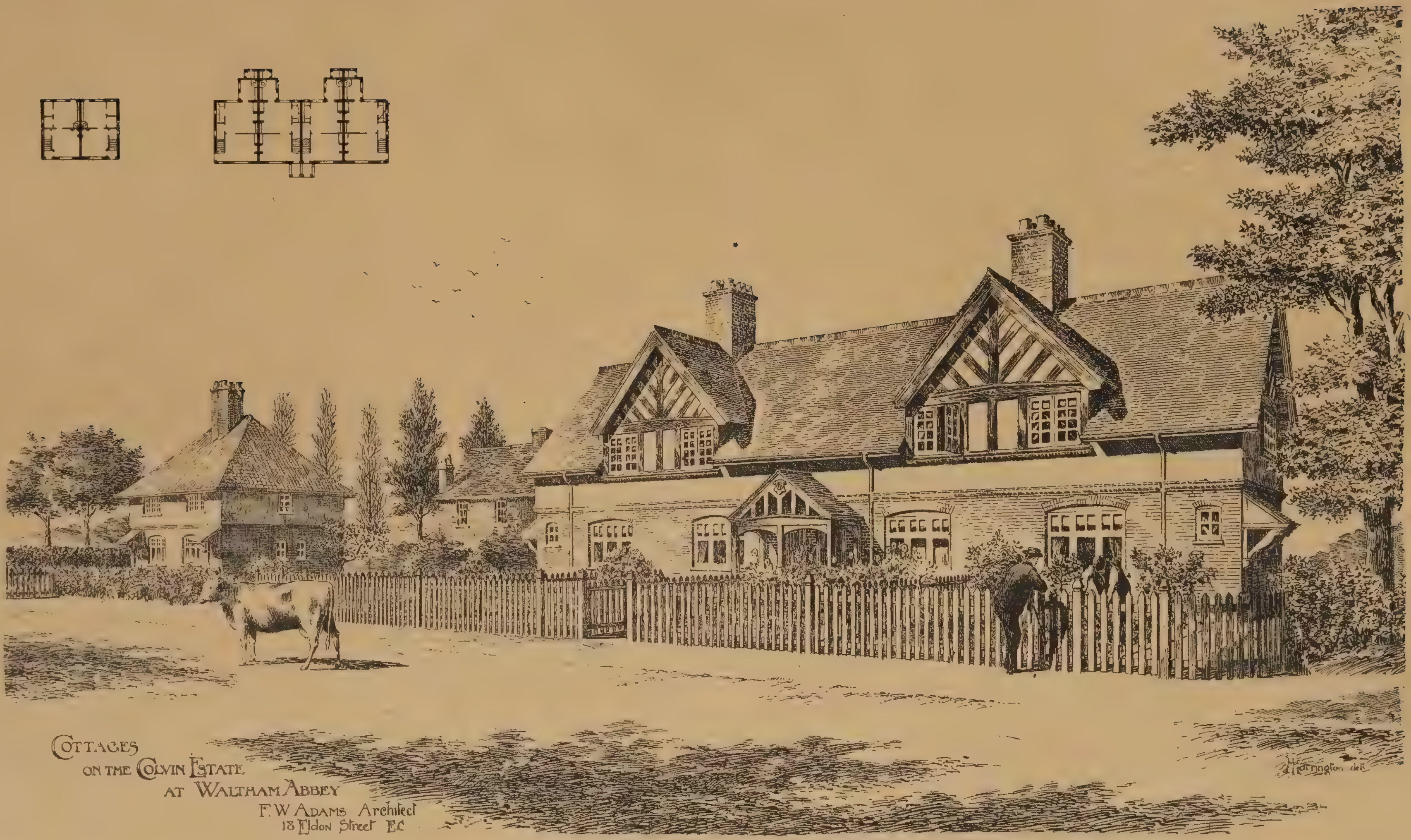

COTTAGES ON THE COLVIN ESTATE AT WALTHAM ABBEY. F. W. ADAMS, ARCHITECT.

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TEXTILE FABRICS.

ART AS APPLIED TO THEIR PRINTING AND WEAVING.

By SIR THOMAS WARDLE, K.B.

A MEETING of the Architectural Association took place last Friday night at 9, Conduit Street, W., Mr. G. H. Fellowes Prynne, president, in the chair. The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Association:—E. H. Bullock, J. G. Burgess, L. R. Cargill, E. Cooper, J. H. Garry, C. G. Gordon, P. W. Lovell, E. Olarte, N. C. Smith, and J. D. Tate. On the motion of Mr. Prynne a vote of congratulation was passed by acclamation to Professor Elsey Smith upon his appointment to the chair of Architecture and Building Construction at King's College, London, rendered vacant by the death of Professor Banister Fletcher.

Sir Thomas Wardle, K.B, then read his paper on "Art as applied to the Printing and Weaving of Textile Fabrics," which was illustrated by a large number of lantern slides and specimens on exhibition in the room. He said:—

The textile industry is one of the earliest. History and the ancient monuments of Egypt clearly prove its existence for at least 6000 years. It is a pleasing idea that the designing of patterns from the earliest times was predominated by a meaning. The term "unmeaning" so often and so justly applied nowadays, well signifies the patterns as a whole of the last 100 years or more. The meanings which educed the older designs were chiefly symbolical of religious beliefs. The sculptured records of the Assyrians show that this ancient people were not behind in the textile arts. In the Bible we find a number of references to the textile arts; in the thirty-fifth and thirty-ninth chapters of Exodus there are two interesting references.

China.

For thousands of years before our era, China has practised the weaver's and embroider's arts, and, above all other countries, the materials were chiefly of silk. The printing of fabrics in China and Japan is both curious and interesting. Some of it is done without blocks, especially in Japan, by stencilling through stiff paper in which the designs are cut. This work is often enriched by embroidery being worked upon it, and very artistic effects are thus obtained. Of the antiquity of printing in these countries, history does not give us much information, but the treatment of their colouring and designing is of a very traditional kind, the latter belonging to the grotesque and symbolic category; but in flower drawing they excel. We can, I think, safely infer from their modern craftsmanship what was characteristic of their ancient work. A great feature of Chinese designing is their adherence to ancient ideals; and a great reluctance to change or to be influenced by modern styles, for Chinese art in textile work, like that of Indian, rests where it has been for ages. It is impossible in the circumscribed space of one paper to cover the whole archæological textile ground, and therefore the textile work of many countries, such as those of Greece and Rome, must necessarily be omitted. But the

Patterned Cloths of Byzantium

must find a place, especially as our European museums and churches are rich in vestures of that time, and more especially so from the fact that Byzantine patterns culminating probably in Justinian's time did not lose their influence in the pattern designers' mind for many centuries after, say up to the fourteenth century, as I shall be able to show. It is to the Emperor Justinian that Europe is indebted for the great development of Christian art in architecture and textile designing. In this early era, the first half of the sixth century, a new epoch arose and a new style was inaugurated, and its influence, as I have just said, remained as a great artistic power until the thirteenth century. Justinian introduced the cultivation of the silkworm, or sericiculture, into Europe from China, and was not slow to perceive the great importance of the art of silk weaving. He caused imperial factories to be built, and engaged clever designers and weavers from Persia whose influence in Byzantine patterns is easy to see. Closely associated with Bryzantian treatment is the Coptic weaving of the Christian Copts of Egypt, large collections of which have been exhumed from the ancient burial grounds of Sakkarah and Akhinim in Upper Egypt by Mr. Flinders Petrie. The patterning of these cloths is very varied and interesting, and dates from the fourth to the tenth centuries. At Akhinim a printing block was discovered, carved in a pattern. Most likely Egyt was the centre of production of this printed work, whence it was for a long time distributed into Western Europe. Akhinim was for centuries celebrated for woollen fabrics. Next in order follow the interesting designs both woven and printed of

Saracenic or Sicilian inspiration.

At that time, when the Normans conquered northern Sicily, towards the end of the eleventh century, a flourishing school of Arab silk weavers had been established there for more than a century. The Norman kings, who highly appreciated the beauty of these silken stuffs, granted special privileges to the Arab weavers, so that they continued to work their silk looms under the rule of the Christian Conquerers; thus from the eleventh to the fourteenth century Palermo continued to be the chief centre for the production of woven and figured silk. The products of these Sicilian looms were exported widely throughout Europe, especially for ecclesiastical vestments, frontals and dossals. The stuffs woven by these Siculo-Arab craftsmen were of two classes; first, the textiles woven before the Norman conquest in Sicily, 1080-1090; and, second, the textiles of the period when these Arab workmen were employed by their Norman conquerors. In the second period the designs were of endless variety, and showed greater freedom than in the first period, in which the designing done (whether woven or printed) was more from purely Oriental motives, mostly of Persian origin—such as a warrior on horseback, with a hawk on his wrist, attended by a hound. The two chief pieces of printed silk which were used to re-enfold the body of St. Cuthbert in 1104, on the occasion of the translation of the body from the temporary tomb it rested in when the Anglican Church of Durham, where it was originally buried, was pulled down to the tomb prepared for it in Durham Cathedral, are valuable examples of the older class. This proves the antiquity of European tissue-printing, although by Eastern workmen. The artistic weaving of textiles spread from Palermo to Lucca in the middle of the thirteenth century, and after that to Milan, Florence, Bologna, Venice, and Genoa. The Saracenic styles gradually gave way to the more flowing and geometrical forms of the Renaissance, in which the pomegranate became a leading type, and gradually by the end of the fourteenth century figures of animals disappeared totally. Italy became, and is, also a silk-growing country, the mulberry flourished there and with it sericiculture was a certainty. The early Italian dyers practised the tradition of the further East, and with Indigo for blue, Kermes and afterwards Cochineal for red, gave them power in tinctorial application which made their coloured fabrics famous and permanent. We now come to what may be called the Genoese velvet and Italian damask period,

The Period of the Renaissance

and of the Italian painters. Although Italy might have depended more for its Renaissance silk designs upon designers of the craft than upon painters, we know in how many instances painters and architects have excelled, and do still excel, in the decorative treatment of patterned work; and I believe such influence and work can be traced in the designs of some of the great Italian painters' pictures. Take, as an example, Carlo Crivelli, who painted in the middle and latter part of the fifteenth century. In his pictures we see elaborate designs in brocaded silk, indicative and typical of the conventional Venetian brocades and velvets of that time. The patterns he painted are all different in design, but there is a sameness and individuality of diaper treatment which makes me incline to the opinion that he was also a pattern-designer for the Italian weavers and printers of those days. The patterns in the pictures of Fra Angelico and Paulo Veronese in the National Gallery are worth studying, being suggestive of earlier patterned treatment, as well as of influences in artistic design which operated for centuries later. Mr. Sidney Vacher a few years ago did historical designing a great service by working out the designs of dress in the robes of Crivelli's pictures in the National Gallery. In the sixteenth and seventeenth centuries designs were in a transition state between the Italians and later French schools. The diminution in size of patterning was caused by the introduction of Spanish styles of dress throughout Europe. The narrow folds and slashings of the garments required small patterns which took the character of fleurs semées, or strewn flowers. From this time down to Louis Seize, pattern designing underwent a great change. It lost much of that conventional character, which is, after all, the charm and the necessity of a good pattern. We find introductions of naturalistic flowers and foliage; the pomegranate gave way to the flower vase, imitations of ribbons, lace, birds, quadrupeds, horns of plenty, fruit, baskets of flowers, and, lastly, Chinese influences, pictorial representations of scripture and other subjects, architectural and al fresco scenes reaching into the eighteenth century, and culminating in the time of Louis XVI. From 1800 downwards we arrive at distressing decadence, artistic inspiration gave way to common-place work by common-place designers, and it is not until we come into what I call the Morrisian period of our own times, that pattern designing as a worthy art has reappeared.

Textile Printing.

As a textile printer, I have naturally been chiefly interested in the history of printing as an art rather than pattern weaving. There is no doubt that printing has been carried on for many centuries in Persia, and has developed to a great extent. In Java and Sumatra the printing is done by drawing the design upon cloth with a very small copper kettle containing melted wax. Women generally do this work. They hold the cloth over one hand, and wax or paint in the design with this tiny kettle and its finely pointed spout or tube, through which the wax flows in fine threads which soon harden. The wax is covered over that portion not required to be coloured by dye, or by a second dye if already coloured in parts, and is then mordanted and immersed in the dye, which colours the parts not waxed. The wax is afterwards removed by heating. Both sides of the cloth have to be waxed exactly alike. Spain was a country which early practised the printer's art. It was no doubt introduced by the artistic Moors, for it is known that in 1234 James I. of Spain issued an edict "estampados," meaning stamped tissues.

Indian Bandhana Work.

"Bandhana" is a word used in India to denote tie-and-die work, from the Hindoo word "bhanda," to tie. It is extensively practised in India, particularly in Jeypore and Ulwar. It was the precursor of printing in the silk handkerchief trade in Calcutta and Bherempur, and is a very remarkable means of producting designs in spots, round, oval, or square, and plaids. Previous to dyeing the cloth, certain parts are tightly tied in a pattern work of wonderful ingenuity, requiring much patience. At Baroda I bought a very curious example of what we in England call warp or chine printing—*i.e.*, the warp is printed in pattern before weaving. In this Baroda wedding robe, however, the geometrical effort is produced by first tieing and dyeing the warp and the weft, and then weaving the fabric. It is a wonderful example of patience and skill, and is as costly as beautiful. A series of very old blocks were given to me in Calcutta in 1886 by a Mahomedan bandhana silk printer. They represent the typical pattern designing of India. The blocks are very small. Some of them are 400 years old, and show many of the patterns which have for so long been printed in Lancashire for cotton dress purposes, derived without doubt from ancient Calicut designs like these. The diapers and pine or cone patterns predominate in all Indian ornament; the diaper treatment for centres and the pine or cones for borders.

Native craftsmen in India do not change their craft, their methods, and rarely their patterns. I was frequently told that their forefathers had done the some work from time immemorial. Their favourite way of putting it was—"My ancestors have worked at this for a thousand years." This is well illustrated in the story of Aboo-Seer and Aboo-Keer, related in Lane's edition of the "Arabian Nights Entertainments," and which received amusing confirmation in my own experience when at Peshawar. The love of pattern, ornament, and colour seems to be a part of their nature, and to be almost automatic, although beautifully wrought. Dyeing and printing are two of the great crafts of India.

Designing for the Church,

for furniture or upholstery and for personal decoration have been the three important divisions or uses of pattern work from the earlier times. By the church I mean all religions and their consequent symbolic expression; and I think I am safe in asserting that the decorative and artistic teaching of religious themes and dogmas holds the highest and most important place. At least it was so in India, in Egypt, and in Europe in the earlier times. The reason of this is not far to seek. All religious beliefs have always had an outward expression, and it was customary for many centuries, and ought to be so still, to offer to God the best, both of art and of all human effort. Witness, as a wonderful example, the products of Gothic art, whether in cathedrals or churches, and their adornment by the best painters and artists in glass, in mosaic, in woven and printed hangings of the greatest possible glory and beauty, in embroidery, in gold, silver, brass, and laten work.

Of the designers, history has shown us, that the best painters at one time were also printers. I believe that the best painters of the Renaissance in Italy designed also for woven tissues.

After the Renaissance

pattern-designing slowly and gradually deteriorated, and grew more and more unmeaning, until in the last century and down to the first half of this it had become a mere language of flowers, and patterns of the most unmeaning, and frivolous description. In no domain of art is it more conspicuous than in calico-printing. I defy anyone to look over the Lancashire printer's pattern books of, say, 1800 to 1850 without feeling that artistic design had been dethroned, and in its place coloured patterned treatments had become the order of the day, which were productions of men who for the most part were unable to draw or to conceive an artistic subject, and in the art of colouring displayed the greatest ignorance. English calico printing owes much to Indian patterns, although deprived of the meanings which generally attach to them there. In this respect the patterns are good, but when the designers were left to their own resources the results were generally inartistic and on the wrong side. This rule, however, was not without its important exceptions.

Let us now consider the improvements that have taken place in the latter half of this century. In the first place we must freely acknowledge the influence and teaching of

The Science and Art Department

at South Kensington in training teachers for the numerous Schools of Art in the Kingdom, well fitted for their work in teaching drawing, and, to some other extent, design. I am one of those who almost regret that the word "Design" was omitted in describing the Schools of Art, because I have often noticed that design is successfully taught, particularly in cases where the students possess some sort of faculty for the work, just as knowledge of colouring—a most difficult thing to acquire—can be and is imparted. The state of both design and colouring is much more healthy than ever before in this country, and I believe from the preference frequently given for English decorative work in both wall-papers and printed textiles on the Continent, that we are assuming, if we have not already achieved, the leading position in these matters. Let me refer to the influence of my late friend

William Morris,

a really very great man in whatever department of art you consider him, whether the art of poesy or of ornament. His power, partly intuitive, but mainly acquired by study of olden artistic work in form and colouring, was amazing. I should have known little of printing but for him. After his success in his beautiful wall-paper designing, he appealed to me to join him in an attempt at improving the art of tissue-printing, chiefly for cretonne purposes. Rather rashly, I think, I undertook the task, being led on by the charm of his personality and the wide range and power of his artistic ability. He limited me, however, to most difficult conditions, which may be summed up in a few words—a revival of all the old (and for the most part discontinued) processes of producing and applying colour, and an absolute avoidance of all artificial dyes. All the old books of the last four centuries had to be rummaged up, whether Italian, French or English. The Indian methods had to be studied by myself on the spot, and not only the research but the application of such knowledge presented difficulties such as I should not like again to encounter.

In Modern Work

the designs on wall papers and on textiles, the beautiful tapestry of Morris, and the painted glass designed by Burne-Jones, are among the finest productions of decorative work for public buildings of ancient and modern times. We are rapidly improving, but it is not only in the home that one sighs for improvement; in street decorations one sees unbounded possibilities, both in architectural design and colouring. Then again there are the forbidding cold and colourless interiors of our churches, chapels and public buildings—the true arenas for artistic decorative treatment—and capabilities far more important than the best canvas pictures ever painted. Now, mural painting and mosaic in such buildings are slowly, but happily, becoming a necessity; they nobly repay the cost, for, first of all, our places of worship surely need it most. Our narrow insular prejudices have too long banished art from their dreary interiors, but happily all that is changing, and patterned beauty, instinct with meaning, is gradually driving back prejudice and ugliness. Many houses in the land possess beautifully arranged interiors. But the houses of the poorest can be beautiful, and the elevation of taste is the elevation of life. Matthew Arnold wrote, "In art there's truth; take refuge there." Those of us who cannot afford costly art at home, can and ought to say, "Let our places of assembly be made as beautiful as collective cost and art applied can make them." There is no better investment for public money. Then we must have art galleries and museums in each and every centre of population, as well as periodical exhibitions of contemporary art work to elevate and encourage workers and the public in their leisure moments. The mind in its search for happiness must ever seek to triumph over matter, and so reveal the beauties which lie hidden there.

> In the still air the music lies unheard;
>   In the rough marble beauty lies unseen;
> To wake the music and the beauty needs
>   The master's touch, the sculptor's chisel keen.

THE DISCUSSION.

Mr. Lewis F. Day, in proposing a vote of thanks to the lecturer, said nobody knew more about silks than Sir Thomas Wardle. He would like to get the opinion of the meeting with regard to the meaning introduced into the pattern. Mr. Day wished to protest that ornament was none the worse for being meaningless and none the better for being chock full of meaning. The story-telling business which we found in early art was only an instance of original sin. He did not believe that anyone derived any satisfaction from the story-telling in the decoration of the bed he lied in; and not one-twentieth part of the general public were a little better than these. With regard to Sir Thomas's allusion to the designing by great painters of the Renaissance, Mr. Day thought it was quite possible; with Crivelli it was most probable. He thought that there was a disposition to think that the pattern designer needed the artist at the back of him, as if he were not an artist himself. Many of the designs shown that evening were far too good for a painter to have done. In the old Assyrian and other designs the fact was that the figures of animals, birds, &c., in them were possibly not ornamental designs for a repeat design, as was required to be done in modern work. They were all right so long as the artist would conventionalise to a considerable degree, but no one who could draw like a Landseer could conventionalise them.

Mr. Beresford Pite, in seconding the vote of thanks, ventured to suggest that the first object in designing a textile fabric was to make a design which would repeat itself indefinitely; the outlines were confined, and if we attached a meaning to one part of the pattern we must make up our minds to accept that simple story when repeated *ad nauseum*. But to suggest to us in these enlightened days that the real basis of effective design was to have a meaning attached to it was rather putting the design back to the days when persons were unable to appreciate anything without a story. Another point: the idea that those long bend, flowing curves, which appeared so powerfully in Renaissance designs would do in all cases was erroneous. These curves were applicable for robes or curtains, but not in panels. This application is best seen in the folding of a drapery, and is probably the secret of the success of those designs which have large patterns. Looking at the whole series of designs exhibited at the meeting one became conscious that we had to use the word style, not in its architectural sense, which was wrong. Style was something quite apart from any recognised forms of decoration. The two elements of decorative design were form and colour; men were to be found having only one sense. It was pleasing to hear Sir Thomas Wardle express his belief that a course of persistent observation and study would affect a change in the sense of colour. The showing of designs in their colours and their representation in black and white on the screen that evening had been most valuable as showing that design was more important than colour. The Lancashire designs had at least that effect of design and contrast which would always tell.

Mr. Sidney Vacher said that he had discovered in studying Crivelli's pictures that parts of the same design had been repeated in two pictures. This and other evidences led him to think that the great painters of that time had the patterns at hand to copy from. He doubted that at that time there would have been sufficient work to keep merely a pattern-maker going, and he thought that these painters would not have introduced other men's designs into their pictures, nor could they have gained access to such designs; therefore he believed that the designs were the painters' own. With regard to ornament, he did not think a merely ornamental design was all that was wanted. We were suffering from the quantity of designers who did nothing else but design; the majority who were doing ornament ought to do something else.

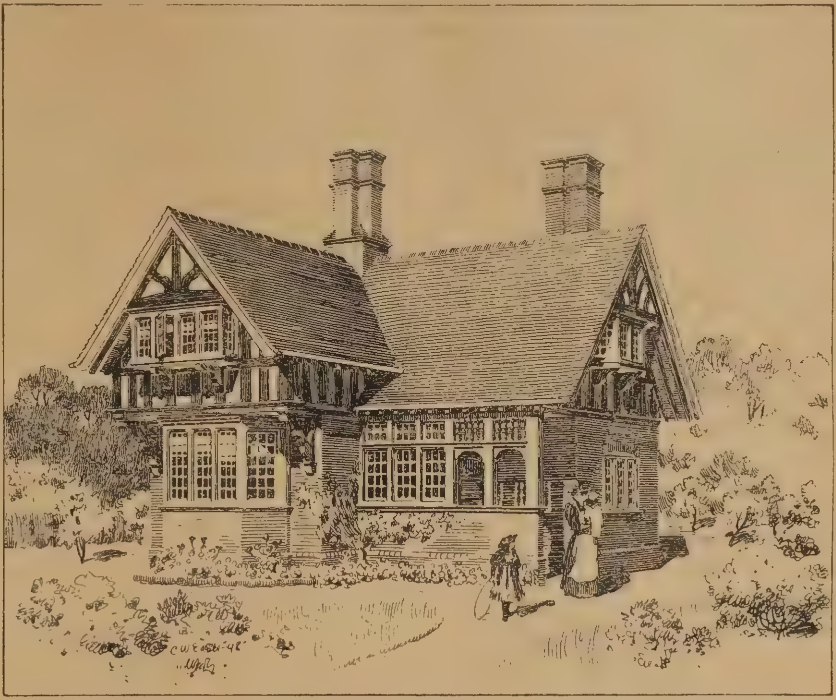
Mr. G. P. Baker was of the opinion that it was not always design which told; the colour was to be considered, and the Lancashire designs which Sir Thomas did not admire had been re-coloured by himself and looked very well.

Mr. W. H. Seth-Smith was sure that all were delighted to hear Sir Thomas Wardle, who was so well able to judge, express his opinion that British art was really taking the lead. He was of the opinion that if in addition to the first impressions and satisfaction which the eyes and the mind received from a beautiful pattern, there were some design and meaning, it would be better; the same remark applied to form and colour. As to symbolism, there was no reason why repetition of form should not weary us any more than design and thought. He was very glad to hear a good word said for South Kensington. Sir Thomas had done great good by introducing the cultivation of silk into Cashmere for weaving.

The chairman, Mr. G. H. Fellowes Prynne, said in the design of textile fabrics it was not a question of style; the influence had not come from either Greece or Rome, but from the East. It was the symbolism which underlies design that was to be noted. Design was very well, but when symbolism was under the design it was of very much greater value. With William Morris's there was always something underlying his designs deeper than mere colour and form.

The vote of thanks having been carried unanimously, Sir Thomas Wardle, in reply, said the chairman had said a good deal of what he had intended to say. All had their beliefs, and he was a firm believer that a motive in this kind of work was desirable; he would even go so far as to say that he would not undertake any work which had not a motive in it. The higher the motive the better would be the work. He could not get up any admiration for those Lancashire designs he had decried. He was quite sure that no colour would make a bad design into a good one. He agreed that a great deal of the effects produced by the French in dress fabrics were by excellent contrast of colour.

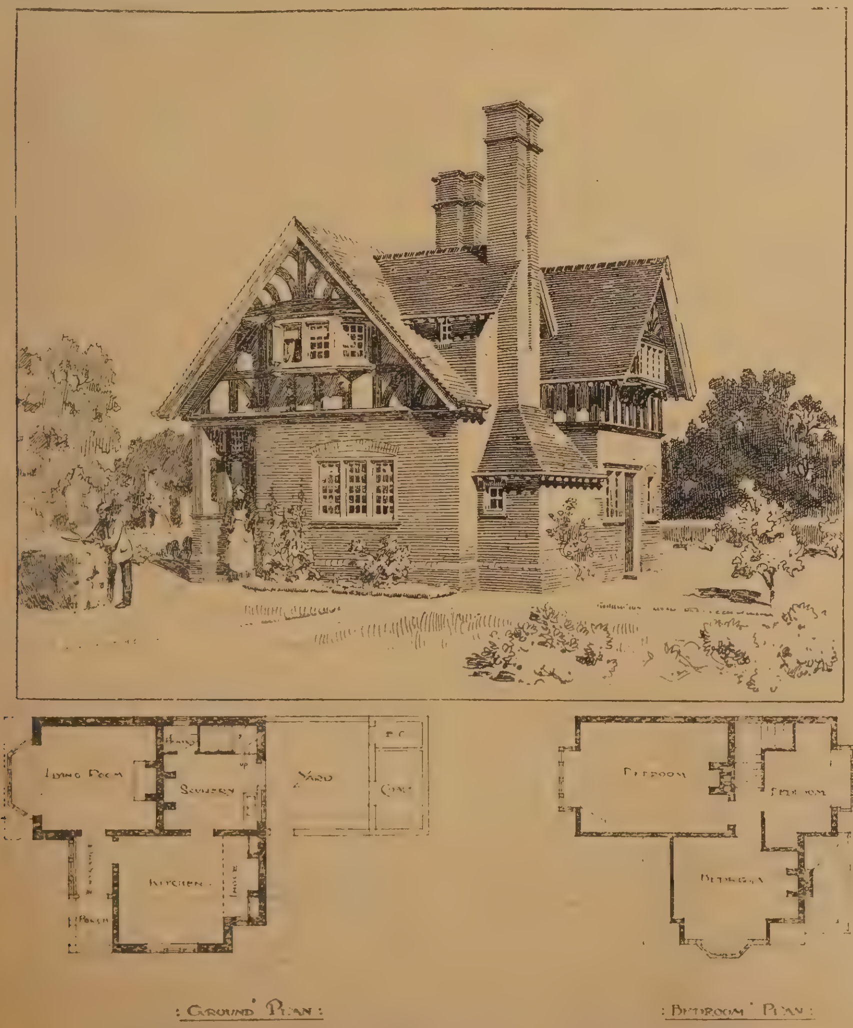
A covered market at Cleethorpes is to be built at a cost of £2,000.



A GARDENER'S COTTAGE AT DOWNE, KENT. W. E. BARRY, ARCHITECT.

A GARDENER'S COTTAGE.

We give on this page plans and elevations of a gardener's cottage which was designed for the late Dr. Barry, at Downe, Kent. It is simple and compact, and looks well with red bricks for the walls, and Broseley tiles for the roof. The architect is Mr. W. E. Barry, of 102, Westborough, Scarborough.



A GARDENER'S COTTAGE AT DOWNE, KENT. W. E. BARRY, ARCHITECT.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

TERRA-COTTA BUILDING BLOCKS.

Darwen, Lancs.—Terra-Cotta writes:—"Can or should the 'filling' of terra-cotta building blocks be composed of ordinary ground mortar and engine ashes mixed?"

Yes; clinkers or cinders mixed with mortar will do, or a small proportion of cement might be used instead of mortar. W. R.

R.I.B.A. INTERMEDIATE EXAM.

Halifax.—F. O. writes:—"What books do you suggest as being most useful for preparing for the R.I.B.A. Intermediate Exam.?"

The books recommended to candidates by the Council of the R.I.B.A. are stated in the "Kalendar," where all particulars of the examinations and sample examination papers are also given. This may be obtained from the Secretary, 9, Conduit Street, London, W., price 2s. 6d. HENRY ADAMS.

IRON BUILDINGS THAT ARE FIXTURES.

H. writes:—"I am renting a carpenter's shop and yard, which is surrounded by a high wall. A few years ago I applied to the owner for, and received, permission to erect a galvanised-iron show-room and office in the yard, a part of the wall forming one end of the building, with a window and door in it, so that it is a permanent structure. I am now thinking of leaving. Can I demand anything for the building?"

You can demand nothing for the building; but possibly you may be entitled to remove it—during the tenancy, not afterwards—as a trade fixture. A. H.

BUILDING CONTRACTS.

Ramsgate.—Builder's Clerk writes:—"I have had a house built, which I was led to believe by the builders (who are also the owners of the other houses and the land adjoining mine) would be built with another house alongside. This they have not done; consequently the party wall, which is mostly built of place bricks with the joints left rough, is now exposed to the weather, $4\frac{1}{2}$in. holes having been left for joists, and chimney openings and flues formed ready for the next house. Can I legally refuse to pay the balance of their contract unless they give me a guarantee to build up against my house within a certain time, or to point the brickwork as required for an external wall? There was no specification—simply a form of contract for a house to be built in every respect the same as the others."

"Builder's Clerk" cannot refuse payment.
A. H.

THICKNESS OF WALL.

SOUTHPORT.—CONSTANT READER writes:—"Kindly give the best method for determining the thickness of a long wall with piers to support roof weight only, and not tied in by any cross walls or floor timbers. Wray and Rivington show the method for fence walls, but such would give an excess thickness, considering that the roof trusses must considerably stay the wall."

There is no difficulty in working out this case when the data are known, but the trouble is to fix upon a suitable wind pressure to allow for. This will be determined by the site and its exposure, and may be for ordinary cases about 28lb. per square foot, blowing horizontally over the whole side of wall and roof. In the case of a long wall, the support afforded by the return at the ends should be left out of account, and the calculation made for, say, one bay, or a length equal to the distance from centre to centre of roof trusses. The weight of the roof on the wall will increase the stability, and will be allowed for as if it were weight of material in the wall itself.
HENRY ADAMS.

SIZES OF TIMBER.

BURTON-ON-TRENT.—F. P. writes:—"Will you kindly give me some particulars of the sizes of timber procurable from the timber merchant; also to what dimensions these will be planed down by the joiner?"

Small timber is stocked by timber merchants in the form of planks, deals, and battens. Planks run from $2\frac{1}{2}$in. to 5in. thick, and from 11in. to 18in. wide; deals from 2in. to 3in. thick, by 9in. and 10in. wide; battens from $1\frac{1}{2}$in. to $2\frac{1}{2}$in. thick, by 5in. to 8in. wide; lengths from 10ft. to 24ft. Saw mills supply converted stuff of each kind, usually quoted as 1, 2, 3, &c., "cut-stuff." The thickness of this may be calculated by allowing $\frac{1}{8}$in. for each cut; for example, a "two cut" 3in. deal will yield three full $\frac{7}{8}$in. boards. These are termed by builders "inch stuff." The average reduction to be allowed for machine planing is, two sides bare $\frac{1}{8}$in., one side full $\frac{1}{16}$in.; hand planing, two sides bare $\frac{1}{8}$in., one side bare $\frac{1}{16}$in. Thus a reputed inch board, planed both sides, will finish $\frac{3}{4}$in. + $\frac{1}{32}$in.; but more must be allowed in the case of cast stuff or "outsides." G. E.

REQUIREMENTS OF MODEL BY-LAWS.

CROMER.—R. CROOME writes:—"Will you kindly give me your valued advice on these two points: (1) I purchased a plot of land 50ft. by 30ft., in a district where the Model By-laws are in force. Being desirous of erecting a dwelling-house on this plot, I find there is no sewer nearer than 400 yards, whilst the By-laws say that a cesspool must not be built within 50ft. of a 'dwelling-house or public building, or any building in which any person may be employed,' &c. What am I to do? (2) Can an Urban Council, which does *not* require an ashpit as described in the Model By-laws, insist on the provision of a back passage to dwelling-houses, so that the refuse can be removed, as the By-law stipulates, 'without being carried through any dwelling-house.' An ashpit, of course, by the Public Health Amendment Act, 1890, includes 'any ashtub or other receptacle for the deposit of ashes, fæcal matter, or refuse.'"

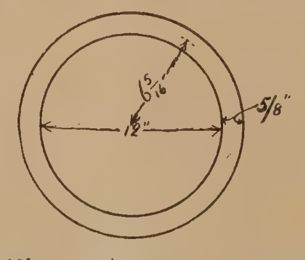
(1) Mr. Croome cannot construct a cesspool on the plot he has purchased. Three courses are open to him, viz.: *(i.)* To acquire—if he can—a site of 50ft., at least, distant from the intended house, and from all other buildings, and the right to make a drain from the boundary of his own premises to it; *(ii.)* to acquire—if he can—the right to make a drain from the boundary of his own premises, over the property of intermediate proprietors, to the sewer. He cannot make such a drain without their consent; but it would seem that he can break up the surface of a highway for this purpose, without the consent of the highway authority; *(iii.)* To call on the sanitary authority to provide him with the means of discharging the sewage from his house, as appears to be contemplated by the 25th Sec. of the Public Health Act (1875), which, where there is no sewer within 100ft. of any part of the site of a new house erected within an urban district, enacts that the sanitary authority shall direct the owner to make the drain, prescribed by that section, from the new house, to empty into some "covered cesspool or other place not under any house." The obligation to provide such a means of discharging sewage has, however, never been judicially declared, and Mr. Croome ought not to take any steps towards building the new house, in reliance upon it, until he has come to an understanding with the sanitary authority.

(2) No. The by-law is conversant with an ashpit that is "constructed," and does not, in my opinion, apply to a case when the refuse is placed temporarily in an ashtub or other loose receptacle. But it is to be remembered that the 35th section of the Act of 1875 requires that every new house shall have an ashpit, furnished with proper doors and coverings. An ashtub, or other movable receptacle, would not, I think, be a compliance with this provision, which the sanitary authority cannot by by-law or otherwise legally dispense with. If then the house is not erected in such a manner as to enable the refuse accumulated in a movable receptacle to be removed without being carried through the house, the sanitary authority can insist on an ashpit proper being constructed, and when it is, insist on compliance with the by-law.
ARTHUR HOUSTON.

PRESSURE OF WATER IN PIPES.

CHELTENHAM.—J. J. writes:—"Will you please give me the solution to the following question, No. 45, Honours Building Construction, Part I., Division I.:—What head of water could a 12in. cast-iron pipe of $\frac{5}{8}$in. metal be exposed to without the stress on the metal exceeding 2,000lb. per square inch?"

Take a ring of 1in. diameter. Then tensional stress on ring = $\frac{5}{8}$in. × 1in. × 2,000 = 1,250lb. Taking moments round centre, 1,250lb. × $6\frac{5}{16}$in.



$= \Pi \times 12\text{in} \times$ water pressure per square inch. Let η = water pressure per square inch. $\Pi = 3{\cdot}14{,}159$. $\eta = \frac{1{,}250 \times 6{\cdot}3{,}125.}{12 \times 514{,}159} = \frac{1{,}350 \times 2}{12}$ (nearly) = 208·3lb. The head of water necessary to give a pressure of 208·3lb. per square inch will be equal to the height of a column of water 1in. square, which will weigh 208·3lb. Head of water $= \dfrac{208{\cdot}3}{\frac{62{\cdot}5}{144}}$ inches $= \frac{208{\cdot}3 \times 144}{62{\cdot}5} = \frac{30{,}000}{62{\cdot}5} = 480\text{in.} = 40\text{ft.}$

MIDDLETON and CARDEN.

Mr. Henry Vaughan, one of the greatest and oldest connoisseurs of art in England, has died.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"Great art dwells in all that is beautiful; but false art omits or changes all that is ugly. Great art accepts Nature as she is, but directs the eyes and thoughts to what is most perfect in her; false art saves itself the trouble of direction by removing or altering whatever is objectionable."—RUSKIN.

The Language of Line. THIS, said Mr. Walter Crane recently in Lord Leighton's studio, consists of symbolic, constructive, and graphic expression. Symbolic expression was illustrated by primitive conceptions, such as symbols of the elements; and allusions were made to the Egyptian hieroglyphics, and the extension of the alphabet. Constructive expression was exemplified by reference to the origin of ornament and its use in architecture; also to certain essential linear systems found throughout nature, systems which the constructive, as well as the surface, designer notices. In discussing graphic expression, Mr. Crane pointed out the meaning associated with certain forms and deviations of line, as well as its power in the hands of individual artists of expressing facts of form and textures, in addition to suggesting thought and emotion. A good example of graphic expression used as decoration is found in the frieze, executed in mosaic from designs by Mr. Walter Crane, that runs round the three sides of the famous Arab Hall in Lord Leighton's house.

The Church of the Three Sites. THE Church of St. Bartholomew in Moor Lane, E.C., has passed through many vicissitudes, for, within a period of less than sixty years, it will have stood on three different sites. First of all it was the Church of St. Bartholomew-by-the-Exchange, but was removed about fifty years ago to make way for the Sun Fire Office. Then it was carefully re-erected in a new parish in Moor Lane, but the population has fallen off to such an extent that St. Giles', Cripplegate, will in future do duty for both, and St. Bartholomew's will be removed to the suburbs. Not the least curious thing about this is that all the stones will be numbered so that the surburban church will be exactly the same as the city one, except for its surroundings.

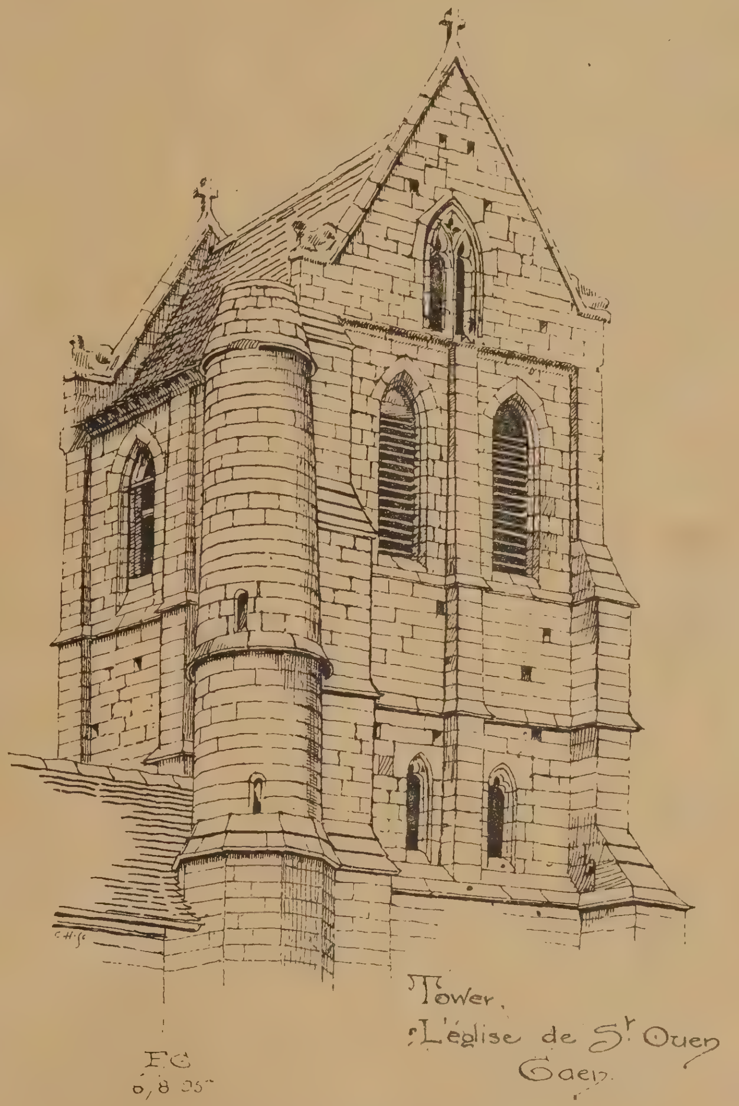
Art in America. MR. STEPHEN D. PEET sings a sad song in the "American Architect" about the future of art and architecture in America. Architects, he thinks, seem to be inclined nowadays to make their profession subordinate to that of the engineer. "The question which they ask first of all is, how can they adapt their art to the new-style building? In other words, the 'skyscraper' has revolutionized the whole system. This looks as if modern civilization was likely to dismiss architecture and religion altogether from society, and subordinate everything to the demands of commerce. The decorating of a steel frame and making a big ornamental box is not architecture. There is a process of differentiation going on which will separate the house architecture from that of the church, the church architecture from that of the public edifice, such as capitols, libraries, halls, institutions of learning, and will also give place to the strange anomaly which is called the 'skyscraper.' The unity of architecture is not likely to appear again. There may be an American style, but it will appear in the home rather than in the commercial building, or even in the public edifice, or in the modern flat." Mr. Peet hopes that this style will supplant the ugly excrescences which have arisen as a result of copying the Old World patterns. Queen Anne style has had its days, as has also the Mansard. Holland and Germany have given about all that we can bear. The American style, probably, will be the outgrowth of the patterns that have been inherited from this country and have been embodied in the old Colonial buildings. The religion of the home was embodied in that style; it may be modified, but cannot be borrowed from France or Italy. Mr. Peet's ideal leads him to conclude his paper with these words: "The American home is the object to which we may well give our best thoughts and make it the place where religion and civilisation shall dwell together." The number of architects who have this high sense of their profession, is, unfortunately, not half so large as one might desire.

Inspiration—and the lack of it. It is given to every man, at one time or another in his life, to do something out of the way, to which rule the sculptor, Carlo Costa, being an ordinary mortal, is, of course, no exception. Twenty years ago King Humbert gave a million lire for the purpose of having a worthy monument erected at Turin to the memory of Victor Emanuel. Carlo Costa was chosen to execute the work, which he promised to complete by 1886; by this date he had gradually received all but 60,000 of the million lire, but the statue was not finished, nor was it ten years later even—in 1896. Such delay was altogether too much for the dignitaries at Turin, and they brought an action against their sculptor. The defence of this ingenuous person was really remarkable. Why did he not go on with the work? For no other reason than that he could not command his inspiration. In the good old days, he said, artists were not expected to furnish works on time, in support of which he mentioned that Leonardo da Vinci had required eighteen years for one of his works and forty years for another. Time, of course, was nothing to the artist. Costa's "fellows of the brush" sided with him in this view, but the authorities were stern, and hard, and practical, with the result that the statue was finished, and was unveiled a few weeks ago. It is said to be a very fine piece of work.

Grand Theatre, Norwich. The Grand Theatre and Opera House, Norwich (shown on one of our inset plates), is being erected in St. Giles, from the plans and specification of Messrs. Ernest Runtz and Co. The front and the covered arcade for foot passengers to the main entrance will be of stone. The main approach is through a spacious crush-room, from which staircases lead to the chief parts of the house. The construction throughout will be of fireproof materials, and the upholstery and decorations will be of an elaborate nature, in all respects equal to the leading West-End theatres. The building will be provided with a complete equipment of fire hydrants and a sprinkler for the fireproof curtain for the proscenium. Heating will be on the low-pressure system, and lighting by electricity. The dressing-room accommodation for the artistes will be excellent, and this block will have an exit direct to the open street, without needing to cross the stage. The building is designed to accommodate over 2,000 persons, and it is expected to be opened to the public before Christmas, 1900.

Our Centre Plates. The drawing shows some of the cottages erected for Mr. R. B. Colvin on his estate at Waltham Abbey to supply convenient and modern homes for the artisans in the neighbourhood. The group of four cottages in the foreground is pleasantly situated alongside the main road, from which they are well set back, thus allowing scope for a front flower garden. They are built with red brick facings to ground floor, the upper story being faced with rough-cast, and the gables constructed of half-timber work; the roofs are covered with plain tiling. In the background is shown a pair of semi-detached cottages. This and similar pairs of cottages have less accommodation than the group of four, and are suitable for small families. They are plainly built, with red-brick facings on ground floor, and rough-cast upper story, with a plain hipped roof covered with pantiles. All the bricks and tiles used in the erection of the houses were made on the estate. The designs are by Mr. F. W. Adams, of Finsbury Circus Buildings, 18, Eldon Street, E.C., the architect to the estate. The house on the same sheet, by Mr. Ernest Newton, is built not far from the moor land at Burley-in-Wharfedale, Yorkshire. The material it is built of is local stone. The building is roofed with stone slabs.

St. Ouen's Church. The only interesting thing about this little church, which is on the outskirts of Caen, is the tower—a striking example of Early French Gothic. The illustration which we give on this page, though very interesting, fails to interpret the charm of the building, not a little of which is due to the holes left by the masons, which may be seen in the sketch. Mr. Frederick Chatterton, of Westminster, is the artist.



DRAWN BY FREDERICK CHATTERTON.

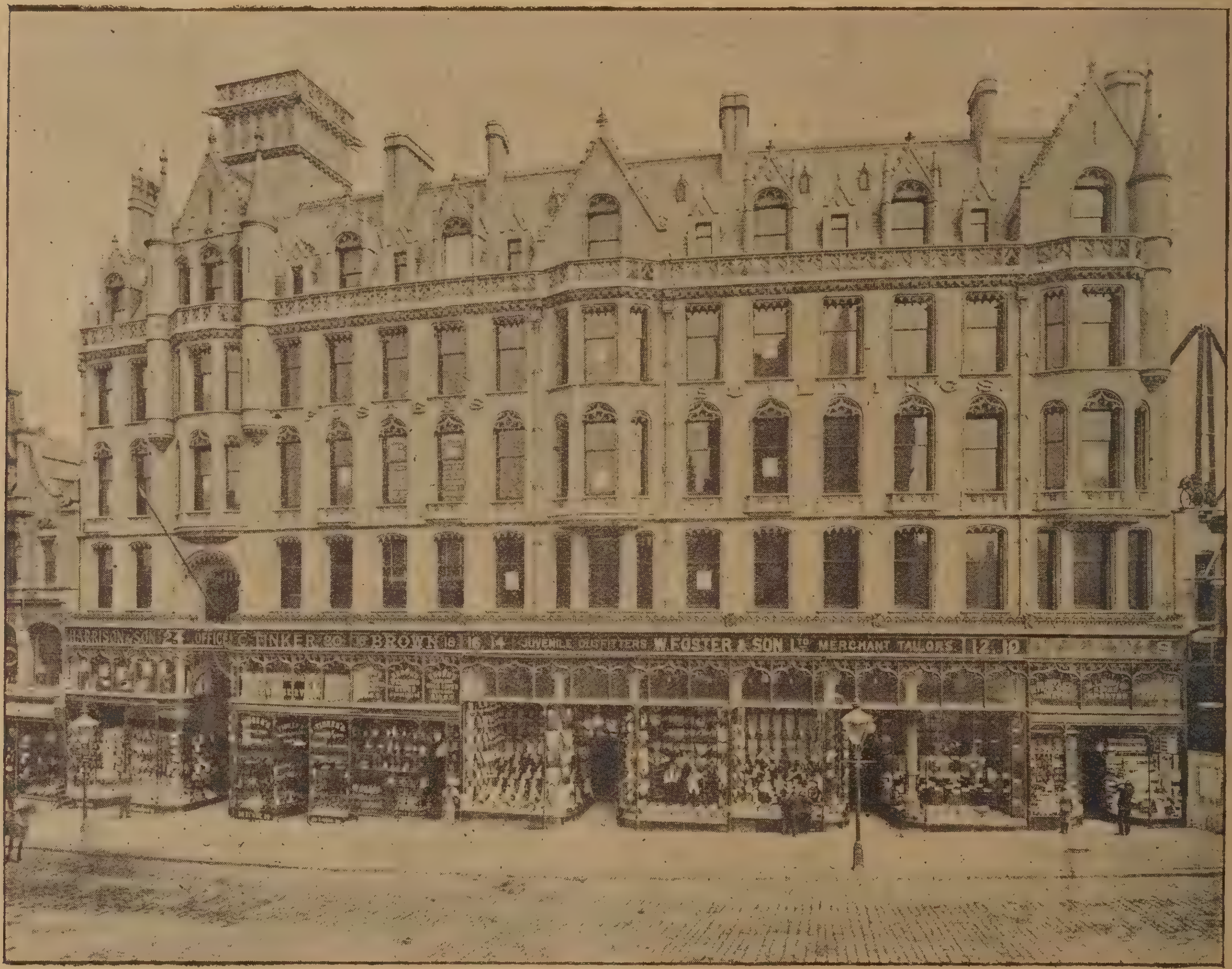
Empire Theatre, Hastings. The Empire Theatre of Varieties at Hastings (see centre plate) has been built from designs by Messrs. Ernest Runtz and Co., of 10, Walbrook, E.C. The site covers a superficial area of 7,860ft., and has a very fine frontage of 131ft. to the Marine Parade, where the main entrance is situated. The entrance hall leads directly into the stalls, whence the circle is reached by a fireproof staircase 5ft. 6in. wide. The pit entrance is approached from the Marine Parade by a spacious right-of-way on the west side of the theatre, while the gallery entrance is at the end of this right-of-way. There are saloons both for pit and stalls and ample lavatory accommodation for both sexes has been particularly provided for. The accommodation in the stalls is for seating 228 persons and in the pit for 176 persons, and the gangways for both parts are thoroughly in accordance with modern regulations. In connection with the circle (which accommodates 201 persons) there is a foyer overlooking the sea, provided with four large windows leading on to a balcony 18ft. above the pavement. This is not only an advantage for ventilating the building in hot weather, but is also an element of safety in case of fire. Balconies, not only in England but all over the Continent, are much favoured in public buildings for this reason. At the rear of the circle is a saloon, raised 4ft. 6in. above the back gangway in order to give a view of the stage. The second tier has a fireproof exit directly on to the Marine Parade, and is connected with an open loggia over the foyer for use during the summer months; this also is an excellent natural means of ventilating the house. Accommodation is provided for 395 persons. The stage is constructed in accordance with modern methods, and electric light has been installed throughout, supplemented by gas. The heating is on the low-pressure system by means of radiators. The building is constructed of good local bricks faced with terra-cotta, and the tiers are made of iron and concrete. The scheme of decoration adopted throughout has been a rich terra-cotta red and old gold treatment for the walls, the box and circle fronts and the ceiling being judiciously gilded on an ivory white ground. The draperies and upholstery are executed respectively in amber satin and velvet, and the Wilton Pile Carpeting throughout is of natural green. The act drop has been painted by that well-known scenic artist Mr. W. T. Hemsley to harmonise with the draperies. One of the features of the decorative scheme is the coffered arch springing from the boxes and forming not only a decorative but a constructional feature of the theatre. It should also greatly assist the acoustic properties of the building. Over the proscenium opening is a freize (in connection with which the architect has received valuable assistance from Mr. Charles Buchel) giving an allegorical treatment of the rising of Venus from the Waters, and for vigour of conception and refined treatment it is highly commendable. Semi-circular decorative panels, representing the seasons, are placed over the boxes; these are very pleasing. Mr. Peter Jenkins, of Grosvenor Works, St. Leonards, was the general contractor.

Professional Practice.

Aberdeen. — The new Beechgrove Free Church, erected from the designs of Messrs. Brown and Watt, is now nearing completion. Light Kemnay granite is the stone employed, and the style of architecture is a phase of Early English, with Scotch features, the effect of the combination being to give an impression of refinement and strength. One of the principal features is the spire, which is to be 175ft. high. The chief entrance is at the foot of the tower in the north-west corner, the result of this arrangement being to allow the gable front of the church to be pierced by an elegant triple-light window, with heavy moulded mullions, rich sills, and pointed tops, which will show effectively in the finely-dressed Kemnay stone. A more utilitarian result of placing the doorway in the tower is to prevent draughts in the interior of the church. Besides the main entrance, a secondary entrance is provided from Beechgrove Avenue in a porch thrown out at the south-western corner. Beneath the main window is a line of dwarf triple-lights, corresponding in width to the large window above. The gable is crowned at a height of 60ft. from the ground with a neat granite final—hardly a cross, yet faintly suggestive of one. The hall is situated in the rear of the church, running north and south; and in this part also are provided the session house, vestries, ladies' room, strong room—for communion plate—lavatories, and other suitable accommodation. Inside there is a series of arches between the nave and the aisles, built of rich red freestone and rising from massive pillars of polished pink granite. The total cost of the church is estimated at £9,000.

London.—On Monday last a private view was given of the new extension and additions to the National Gallery of British Art (Tate Gallery) at Pimlico, which have been carried out from the designs of Mr. Sidney Smith, F.R.I.B.A. The new extension occupies about the same extent of ground as the earlier building, but of course the main architectural features, the handsome portico and the vestibule, &c., have not been repeated, and the whole ground has been available for galleries, of which the new building includes nine, in addition to a studio and restoring room. The new portion affords more wall space than the building now open, and it has also a very fine central sculpture hall. The original building was wired throughout for electric lighting, but when the Trustees took it over they determined that there was some risk involved in artificial illumination of any kind, and it thus unfortunately happens that when the weather is dull or foggy the place has to be closed. As this has been the decision of the Trustees with regard to the original galleries, it has not been thought worth while to provide for lighting the new ones. It may be mentioned that the Tate Gallery has more wall space than the National Gallery or the Royal Academy, and, altogether, has cost something like £150,000. Artistic visitors will be glad to hear that the Watts pictures will be brought together into one well-lighted room in the new building.

Loughborough.—On December 13th next Viscount Cross will open the new Conservative Club that has been built in Baxter Gate from Mr. W. T. Hampton's designs. Messrs. T. Barker and Son were the contractors. Red pressed bricks and Derbyshire stone dressings have been used for the front, which has been set back about a yard from the old building line. The entrance vestibule has the walls covered with glazed tiles, and a mosaic floor, and the entrancehall is fitted up with a pitch pine staircase leading to the reading-room, which is on the first floor. Owing to the limited width of the site, considerable difficulty was experienced in arranging the rooms, but this has been successfully met by arranging the principal rooms with a corridor along one side. A commodious smoking-room 20ft. square and 12½ft. high has been provided. The vitiated air is drawn from all rooms by means of air shafts, at the upper end of which is placed a Bunsen gas-burner to create an upward current in the shaft, at the same time creating an inrush of fresh air at the various tube inlets. The billiard-room,



FOSTER'S BUILDING, SHEFFIELD. FLOCKTON, GIBBS, AND FLOCKTON, ARCHITECTS.

which is light and spacious, is 39ft. by 25ft., and has elevated seats upholstered in red leather, the floor being of wood blocks; the room will accommodate two tables. Beyond the billiard-room is a card-room, 20ft. by 16ft. By means of moveable partitions a room 86ft. by 22ft., and capable of accommodating 400 to 500 persons, can be formed.

Sheffield.—Foster's Buildings stand at the head of High Street, which is one of the best shop centres of the city. They had to be designed to meet the requirements of the tenants, and to satisfy all their wishes, as they were leaseholders of the old property which was pulled down. The shops are very varied in size, being from 57ft. wide by 100ft. deep to 13ft. wide by 31ft. deep. The upper storeys are used as offices, the entrance to which is arched, with a tower above. The tower was intended to contain a cistern for a hydraulic elevator, but a high pressure cistern has been substituted. The offices are well lighted back and front, and are approached by corridors 8ft. wide. The design is in the French Gothic style, but owing to the demand of the tenants for plate-glass windows upon which they can put their names the mullions had to be omitted, which altered the character; in fact, it is the reverse of the fashionable style, being somewhat classical in its general conception, with Gothic details, instead of being Gothic in its general conception with classical details. Unfortunately the building faces north, and seldom gets the sun upon it. The Gothic details have in this situation the advantage over the classical. The architects are Messrs. Flockton, Gibbs and Flockton.

Views and Reviews.

ARTS AND CRAFTS ESSAYS.

To those who are not artists, and yet wish to have things as they should be, the volume of essays by members of the Arts and Crafts Exhibition Society can be recommended with only some slight reservations. If some of the essays are compact to a fault, it is because they formed parts of the catalogues of the Society's first exhibition, where excursions beyond the narrowest limits were not to be thought of. It must be remembered, moreover, that some of the best writers were also the busiest artists, and could not have done more except for a consideration of which nothing was said, I suppose. There is enough in the facts to account for the "classical parsimony" with which they dispense their favours. We wish that the best had been longer, and wishing is praising here.

The writers set forth very clearly the principles by which they are guided, and do something more than suggest what should and should not be attempted. In the saying that "The cobbler should stick to his last" (which should be easy with wax at hand) lies the gist of it all. "I maintain that the true end of an art is that which it and no other is fit for." The author of this egregious and obvious platitude was no better furnished by nature than his great contemporary Johnson, and no better able on the evidence of dulled senses to demonstrate the emotional value and significance of the works which he took as his subject.

Now Lessing, if not actually colour blind, knew nothing, at any rate, of our delight in considered effects of colour; as for music, it simply annoyed him. Yet this same man, removed from ourselves by a vast, became possessed of an idea which critics have found invaluable, and the "Laocoon," in which he expressed it, will retain its place for all time as the work of a master mind. His enquiry was limited, the reader must know, to a comparative study of the sculptors' art and the poets', supposing a subject common to both, and assigning to each his domain. The method once mastered admits of being extended to art works of all kinds, including literary ventures of course, and we may proceed thereupon to consider what each in its turn is fit for. A book which set Goethe thinking may be said to have set the world thinking, and I, for my part, owe all I am worth to this essay.

For convenience of thought and reference, the subjects most closely allied to architecture are treated in sequence here, while the next of kin hug one another in other parts of the volume, and the collection, as a whole, is less miscellaneous than it appears at first sight. The cement is in the idea, and that, as was said, is a good one. In so far as it treats of technical matters it is rather to be shelved for reference than nursed like the newly born. The "purple patches" of truly felicitous phrasing are few as might be supposed, but most welcome when they appear, as in Mr. Lethaby's essays for instance. In that on "cast-iron" he speaks of Ruskin's "fearless use of paradox striking one into thought." The phrase "meanders of vine," whether his or another's, is very delightful, and happy indeed is his preference for "substantial and bounding form" in "objects cast in the round." The literary craft has the most obstinate laws of all, and if this is to be brought into line with the rest as in the Art Workers' Masque, they cannot be too assiduously studied. E. R.

Essays by Members of the Arts and Crafts Exhibition Society. Messrs. Longmans, Green and Co. 2s. 6d.

ORNAMENT AND ARCHITECTURE.

Mr. Glazier states in his preface that this manual has been prepared with the three-fold object of giving an elementary knowledge of architecture and historic ornament, of awakening a responsive and sympathetic feeling for the many beautiful and interesting remains of ancient and mediæval civilisation, and, lastly, of directing the attention of students and craftsmen to the beauty, suggestiveness, and vitality of the industrial arts of the past, and their intimate relation to the social and religious life of the people.

This book runs to 136 pages, and consists of a number of short chapters, each of which deals, in an elementary fashion, with the characteristic forms of the various styles of architectural ornament—such as Roman ornament, Scandinavian ornament, Persian ornament, &c.—and then with the different forms of what are called industrial arts, such as textiles, mosaics, glass, pottery, &c. The whole is illustrated with 470 drawings by the author, either in plates or mixed with the text, and the general get-up of the book—the paper, printing, and binding—is admirable.

It is always a little difficult to know how to take books like this, how to place them, on what lines to judge them, how to determine their real value and intent. The author on his title page says that it treats of "the evolution, tradition, and development of architecture and other applied arts," and is "prepared for the use of students and craftsmen."

In the first place, architecture is not an applied art. It is the art of building—that is, it is a structural art, the art of construction. One cannot protest too often against the idea that architecture consists of applying decoration to a structure that was not architecture before it was so treated. The structure itself is the architecture, when there is any in the case.

If, however, this term "applied art" simply means art applied to a useful purpose, then it is a term which could be used equally for all forms of art, all of which serve a useful purpose, otherwise they would not exist. But apart from this, which may merely be an inaccuracy of expression, this description leads us to expect much—much more than we find. Evolution is a big word, it means a big thing. The evolution of architecture is something apart from ornament; it depends on matters that lie deeper than surface decoration; it is hardly to be adequately handled in a manual of historic ornament. The same thing is true of tradition and development. It seems to us that where this book confines itself to the *rôle* of a manual of historic ornament it may serve a useful purpose. It gives clear and definite illustrations, which admirably suggest the general forms and construction of the different types, with information in the letterpress of much value as regards matters of fact; but when it attempts to go further, and to deal in general historical deductions, or to generalise in matters of theory, it seems inadequate and superficial. To say that the Gothic shows "no traditions beyond Sicilian or Arabian influence" is to express less than the whole truth. To tell us that "when the Emperor Constantine removed the seat of government from Rome to Byzantine (*sic*), in the year A.D. 330, he inaugurated a new era in art, viz., the Byzantine," is not giving us the gist of the matter. It almost suggests there was an Imperial edict, "Let there be a new era in art," and it was so.

We notice, also, short chapters devoted to a general description of the architecture of different periods. In these we find included much information which, though doubtless it has its own value, is yet hardly germane to the matter in hand, and is inserted to the prejudice of much that is vital. For instance, in the chapter on Greek architecture, which takes up altogether less than three pages, more than half a page is occupied by a classification of temples—apteral, dipteral, distyle, tetrastyle, &c.—and by a table giving the relative heights, in parts of the diameter, of the entablatures of some typical Greek buildings. Surely the author, in giving such a brief sketch, could have found something more vital to say than this. These facts are interesting enough, but principally to the archæologist; they have but a remote bearing on historic ornament. The same tendency is noticeable in the chapters on Roman and Gothic architecture. We think the more valuable part of the book is that which deals with the industrial arts. A. R. J.

"A Manual of Historic Ornament." By Richard Glazier. B. T. Batsford, 94, High Holborn, W.C. 5s. net.

New Patents.

These patents are open to opposition until January 1st.

1898.—Refuse Destructors.—24,582. J. WILLOUGHBY, Plymouth. To enable the refuse to be more easily fed to the destructor, it is tipped from the carts on to a turntable, which may be flush with the floor or platform, and is provided with any suitable locking device. This turntable is adjacent to the destructor.

Finishing Sanitary Pipes. — 24,957. J. R. W. WOODWARD, Ashby Woulds, and N. COLLIER, Woodville. After being removed from the machine the pipe is placed on a perforated floor, and is there partly dried by a heat applied from below. It is now placed in a kind of lathe, where it is straightened on a mandrel, trued up, and scratched by suitable tools. A frame of wires is used for cutting off. The burning is as usual.

Cranes and Excavating Apparatus.—25,384. T. WHITTAKER, Horsforth, Leeds. Instead of turning the crane by cog-wheels or gear, plain pulleys wound over with steel rope are employed. One is at the foot of the crane mast, and the other is on the slewing motion shaft. A spring buffer is provided where the joint in the rope occurs. This invention is intended to reduce the strain on the crane.

Centrifugal Pumps.—25,988. J. GWYNNE and E. W. SARGEANT; both of London. Combined with the pump is an ejector that is operated by a jet of water supplied by a supplementary pump. This arrangement is claimed to be more convenient than that in which steam is used to start the pump.

Crane Hooks.—26,923. D. T. YOUNG and H. W. YOUNG, Birmingham. To increase the strength, the hooks, when hot, are made into girder-like section around the bend, where the greatest strain occurs.

1899.—Artificial Wood and Stone.—10,798. J. A. WHEELER and S. W. EELLS; both of America. Fibrous pulp (for fireproofing asbestos fibre is used) is mixed in equal quantity with ashes or talc, or both; water is added, and when thus in a plastic state, silicate of soda or potash is put in. When exposed to air and heat the material becomes as hard as stone, and the moulded article can be further hardened by giving it a coat of chloride of magnesia solution. Pulverized resins are added when wood pulp is used.

Glazing.—11,208. J. R. Scholefield, Liversedge. The supporting bar is grooved to carry off condensation, and in one of the grooves is a rubber strip on which the glass seats, being held in place by metallic caps secured with screws. The caps are also grooved to receive a rubber cushion, and are formed so as to allow for expansion and contraction of the glass. No putty is used.

Sewer Ventilators.—17,049. E. R. Palmer, Beckenham. A positive up-draught is created in sewer ventilating shafts by inside fans, propelled, preferably, by water from the main. Where the sewers are periodically flushed from automatic flushing tanks, the waste water from the motors may be taken into the tanks for filling them. Means are provided to prevent down-draught.

Window Blinds.—17,067. S. Buchner and N. Samet; both of Austria. The curtain is attached to one or more sets of lazy-tong levers arranged at the top, or top and bottom, of the window. They are operated by a handle and lever, which thus makes the opening and closing of the blind easy.

The following specifications were published on Saturday last, and are open to opposition until January 8th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—20,712, Wadsworth, street cleansing machines. 23,305, Shone and Ault, apparatus for raising sewage and other liquids by direct air pressure. 26,466, Fyfe, water closets. 27,030, Shanks, apparatus for distributing enamel powders, &c.

1899.—71, Haddan (*Schuppmann*), stoves for warming purposes. 172, Fawcett, presses for pressing sand-faced and other bricks. 1,264, Kirk, traps for gullies for roads, streets, yards and stables. 2,152, Isles, Ltd., and Tempest, combined pile driver and crane. 5,337, Cole, fire grates. 17,787, Lake (*McCloskey and Scully*), machines for making wire fencing. 17,979, Ascoli, nails. 18,517, Nesemann, windows. 18,835, Boult (*Gebler*), apparatus for use in breaking up roads, &c. 18,959, Household and Ardley, traps for closets, urinals, lavatory basins, ventilation pipes, &c. 19,407, Moran, waterworks systems. 19,411, Ives, method of and apparatus for the treatment of sewage and similar liquids. 19,607, Savery, facing brick. 19,697, North, guard for circular saws.

Grimsby Workhouse is to be extended. The estimated cost of the work is £6,200.

Back Numbers of the "Builders' Journal."—The publisher will be glad to receive from readers, any copies which they may be able to spare of the following numbers of the Builders' Journal:—Nos. 1, 3, 5, 6, 27, and 35. In exchange, he will be pleased to send a copy of the current number of The Architectural Review.

Leonardo da Vinci's famous picture, the "Last Supper," is reported by a Milan correspondent to be fast covering with a layer of greyish mould, so that great portions of it are quite indistinguishable. A commission of experts has been called to examine this great work of art to see whether anything can be safely attempted to preserve it.

The Hotel Russell, in Russell Square, W., a huge structure in red brick and terra-cotta, has been built from the designs of Mr. C. Fitzroy Doll, and will accommodate 500 visitors. It covers an area of more than three-quarters of an acre, and is nine storeys high, with a lofty dome and minarets. On the principal frontages are shields in glazed coloured pottery containing the arms of many nations, while there is an observatory on the tower in Guildford Street. Over the principal entrance in Russell Square are four terra-cotta statues of Mary, Elizabeth, Anne and Victoria.

Keystones.

A Sailors' Home at Chatham is to be built at an estimated cost of £15,000.

New barracks at Colchester, to be named the "Gujerat," are to be built by the Government.

St. George's Church, Balbriggan, Co. Dublin, has had its tower repaired, a new pulpit provided, and new pews.

Some interesting interiors of Arundel Castle, Sussex, are given in the "South Coast Quarterly" for November.

Memorial windows to the memory of the late Canon Allen have been placed in the Porthkerry and Barry parish churches.

Forty sites for new Board schools, or for enlarging existing ones, are proposed to be acquired by the London School Board.

Horton Asylum, Epsom, for which the L.C.C. authorised an expenditure of £350,000 in 1896, has been found to cost £456,130.

A consumption hospital at Liverpool is to be built from designs by Messrs. Willink and Thicknesse.

A new Liberal Club at Farsley has been built, at a cost of £3000, from designs by Mr. W. D. Gill, of Stanningley.

A new statue at St. Peter's, Rome, of St. Peter Fourrier, of Alsace, has just been erected. It was chiselled from a block of marble weighing forty tons.

The Leicester Society of Artists are at present holding their seventeenth annual exhibition of pictures at the museum buildings. The exhibition will remain open until January 13th.

Messrs. S. B. Bolas and Co., 77, Oxford Street, W., are the authors of the photographs of Scott's Restaurant, the "Rising Sun," and the "Old Shades," which appeared in our "Men Who Build" article last week.

A new Wesleyan church at Weston-super-Mare is being built in Station Road, at a cost of about £5,600, from designs by Mr. W. J. Morley, F.R.I.B.A., of Bradford—selected in competition.

A Roman Bath has been discovered in connection with excavations at Valle Crusis Abbey, Llangollen. An ancient Celtic cross and a tombstone of the twelfth century have also been found.

Change of Address.—The office address of Mr. Lewis Angell, C.E., late engineer and architect to the County Borough of West Ham, is now: Westminster Chambers, 11, Victoria Street, S.W.

The new "Old Bell" on Holborn has been built from Mr. Arthur Dixon's designs. Red polished granite has been used for the lower, and Portland stone for the upper part of the building.

"The Round Towers of Ireland" was the title of a paper read by Mr. Anthony Scott last week, before a meeting of the Architectural Association of Ireland, the president, Mr. G. Sheridan, being in the chair.

The Lakes of Killarney were put up for sale on Tuesday in last week, but as the highest bid only reached £50,000 the property was bought in. On Saturday last, however, the estate was sold by private treaty to Lord Ardilaun for £60,000.

A Lady Sculptor Wins.—A young lady named Mynssen has won the first prize for sculpture in an exhibition in Holland. According to the judges, her statue, representing Spring, is one of the best pieces of work produced latterly.

Housing the Poor.—In New York, next month, an exhibition will be held which will chiefly consist of models of existing tenements, both in America and elsewhere. It is proposed to send some of the exhibits to the Paris Exhibition.

New Companies.

City Land Syndicate, Limited.

This company was registered on November 15th by Waterlow and Sons, Limited, London Wall, E.C., with a capital of £15,000 in £10 shares, to acquire and traffic in land, houses, and other property in the city and county of Kingston-upon-Hull or elsewhere, and to carry on the business of decorators, lime, timber, and hardware merchants, &c. The directors (to number not less than three nor more than six) are George T. Butterworth, Edward Goddard, George L. Shackles, William S. Sharp, and Arthur J. Windross. Qualification, £500. Remuneration, £100, divisible, for the first year; afterwards as fixed by the company.

Woolpit Brick Company, Limited.

This company was registered on November 4th by G. H. Daniell, 4, Great Winchester Street, E.C., with a capital of £80,000 in £1 shares, to acquire, by purchase or otherwise, the Woolpit Estate, Suffolk, and the business carried on under the style or firm of the Woolpit Brick Works Company, Limited, to adopt and carry into effect an agreement expressed to be made between the proprietors of the Woolpit Estate and this company, and, generally, to carry on in all or any of their respective branches the businesses of manufacturers of and dealers in bricks, tiles, pipes, terra-cotta goods, pottery, earthenware, enamelled and glazed goods, sanitary ware, sanitary appliances, &c.; as lime burners, &c. The first directors (of whom there shall be not less than three nor more than five) are to be elected by the signatories. Qualification, £250. Remuneration, £100 per annum each (chairman, £200).

West London Property Corporation, Ltd.

This company was registered on November 2nd, by Woodcock and Co., 15, Bloomsbury Square, W.C., with a capital of £150,000 in £1 shares (100,000 of which are preference shares and 50,000 ordinary), to adopt and carry into effect an agreement to be made between H. P. Lowe and C. F. Quin and this company; to acquire, deal with, work, and turn to account any real, leasehold, or personal property, and to sell, let, lease, exchange, mortgage, charge, enfranchise, and dispose of the same; to develop the resources of such land, estates, &c.; as builders and contractors, house and estate agents, decorators, merchants of and dealers in stone, sand, lime, bricks, tiles, timber, hardware of all kinds, terra-cotta and other building requisites, &c. The first directors (of whom there shall be not less than two nor more than five) are Sir J. T. Brunner, Hon. J. S. Montagu, H. P. Lowe, C. F. Quin, and E. N. Paton. Qualification, £100. Remuneration to be fixed by the company.

Marble Hill Syndicate, Limited.

This company was registered on November 6th by Minet, Pering, Smith and Co., 81, Cannon Street, E.C., with a capital of £20,100 in 200 ordinary shares of £100 each 1,000 founders' shares of 2s. each, to acquire and turn to account any buildings and lands, and to carry on the businesses of builders, decorators, brick, timber, and hardware merchants, &c. Registered without articles of association. Registered office, 81, Cannon Street, E.C.

Ashford Manor Estate and Golf Clu
Company, Limited.

This company was registered on Novembe 16th by G. B. W. Digby, 2, Coleman Street E.C., with a capital of £5700 in 500 five pe cent. cumulative preference shares of £10 eac and 700 deferred shares of £1 each, to acquir the Ashford Manor Estate at Ashford, Middlesex, to adopt an agreement with the Genera Contract Company, Limited, and to carry o the business of builders, brick, timber, an hardware merchants, &c. The first director (to number not less than two nor more tha seven) are to be appointed by the subscriber Remuneration as fixed by the company.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 4 0
Sainfoin mixture	do.	3 15 0	4 7 6
Clover, best	do.	4 0 0	5 0 0
Beans	per qr.	1 8 6	1 9 6
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ...	per cwt.	1 3 4	1 6 10
Colza Oil, English ...	per cwt.	1 4 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 10 0	—
Linseed Oil	per cwt.	1 1 9	—
Petroleum, American ...	per gal.	0 0 7¼	0 0 7⅜
Do., Russian ...	per gal.	0 0 6 5/16	—
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 5 0	1 5 3
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 17 0	—
Lead, white, ground, carbonate	per cwt.	1 3 0	1 4 0
Do. red	per cwt.	0 19 4½	—
Soda crystals	per ton	3 0 0	—
Shellac, orange	per cwt.	3 2 6	3 3 0

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ...	per ton	86 0 0	—
Iron, bar, Staffs. in London	do.	9 10 0	10 0 0
Do. Galvanised Corrugated sheet ...	do.	14 5 0	15 0 0
Lead, pig, Spanish ...	do.	17 15 0	—
Do. do. English common brands	do.	17 17 6	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	18 10 0	19 0 0
Do. pipe	do.	19 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Nails, floor brads	per on	9 15 0	10 15 0
Tin, Foreign	do.	127 5 0	127 15 0
Do. English ingots ...	do.	131 0 0	132 10 0
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	25 10 0	—
Do. Spelter	do.	20 7 6	20 12 6

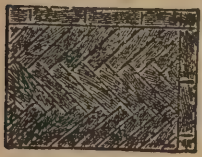
TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Do. Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	per bundle.	0 1 4½	0 1 5
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd.	do.	12 10 0	12 15 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	15 5 0	17 5 0
Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	10 15 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	12 0 0	16 15 0
Do. White Sea	do.	13 0 0	17 0 0
Do. Quebec Pine, 1st...	do.	19 5 0	24 10 0
Do. do. 2nd	do.	13 15 0	15 15 0
Do. do. 3rd &c.	do.	9 10 0	—
Do. Canadian Spruce, 1st	per P. Std.	10 1) 0	—
Do. do. 3rd & 2nd	do.	8 5 0	8 10 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	7 5 0	9 5 0
Flooring Boards, 1 in. prepared, 1st	per square	0 9 9	0 11 0
Do. 2nd...	do.	0 9 9	—
Do 3rd &c.	do.	0 7 9	0 9 3

HARD WOODS.

		£ s. d.	£ s. d.
Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4½	—
Do. Honduras	do.	0 0 4 5/16	—
Do. Tobasco	do.	0 0 3 31/32	—



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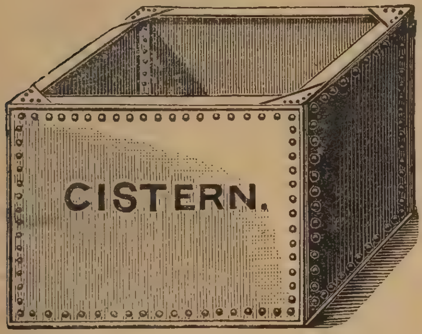

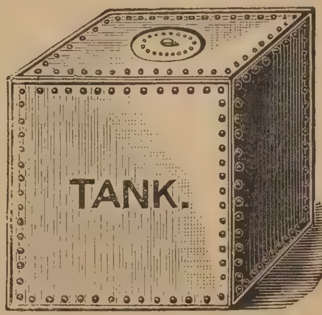

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Elm, Quebec	per load		12	6	5	10	0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0	0	5 25/32			—
Do. African ...	do.	0	0	5			—
Do. St. Domingo ...	do.	0	0	5 11/16			—6 1/16
Do. Tobasco ...	do.	0	0	4½			—
Do. Cuba ...	do.	0	0	6 7/8			—7 21/32
Oak, Dantzic and Memel	per load	3	0	0	3	3	0
Do. Quebec	do.	4	12	6	5	0	0
Teak, Rangoon, planks ...	do.	[illegible]	10	0	16	10	0
Wainscot, Riga (Baulk) ...	do.	3	15	0	5	15	0
Do. Odessa Crown ...	do.	3	15	0	5	15	0
Walnut, American ...	per cub. ft.	0		9	0	3	5

COMING EVENTS.

Wednesday, November 29.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. J. P. Allen, P.A.S.I., on "Expanded Metal." 7.30 p.m.

SOCIETY OF ARTS.—Mr. Allen Wyon on "The Great Seals of England." 8 p.m.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. W. A. Bond, M.A., M.D., D.P.H., on "The Laws, Byelaws, and Regulations affecting the inspection and sale of meat and other articles of food, including their preparation and adulteration." 8 p.m.

RUSKIN SOCIETY OF BIRMINGHAM.—Mr. Charles Holme, F.L.S., on "Ruskin's Nature of Gothic." 8 p.m.

Thursday, November 30.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: the Bones and Muscles of the Trunk, and their Surface Forms."

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

GLASGOW INSTITUTE OF ARCHITECTS.—General meeting at 2 p.m.

INSTITUTION OF CIVIL ENGINEERS.—(Students' Meeting.)—Presidential Address by Sir Douglas Fox. Mr. L. H. Rugg on "Bridges for Light Railways." 8 p.m.

Friday, December 1.

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE.—Mr. Hirst on "Recent developments of the Law Relating to Drainage." 7 p.m.

ARCHITECTURAL ASSOCIATION. (Discussion Section).—Mr. F. C. Eden on "Church Furniture." 7 p.m.

Saturday, December 2.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE AND ART (Student Section).—Mr. R. Gibson on "Electricity in Building Work." (With experiments.)

Monday, December 4.

SOCIETY OF ENGINEERS.—Mr. Gordon Harris, A.M.I.C.E., M.I.M.E., on "Water Supply to Country Mansions and Estates." 7.30 p.m.

VICTORIA AND ALBERT MUSEUM.—Mr. Hugh Stannus, F.R.I.B.A., on "Historic Evolution of Applied Art—IX. Roman Pre-Christian Art." 6 p.m.

SOCIETY OF ARTS.—(Cantor Lectures).—Mr. Henry Hardinge Cunynghame on "Art Enamelling upon Metals."—III.

VICTORIA INSTITUTE.—Mr. R. H. Mathews, L.S., on "Pictorial Art among the Australian Aborigines." 4 p.m.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. Beresford Pite, F.R.I.B.A., on "Building Conditions in the East." 6.30 p.m.

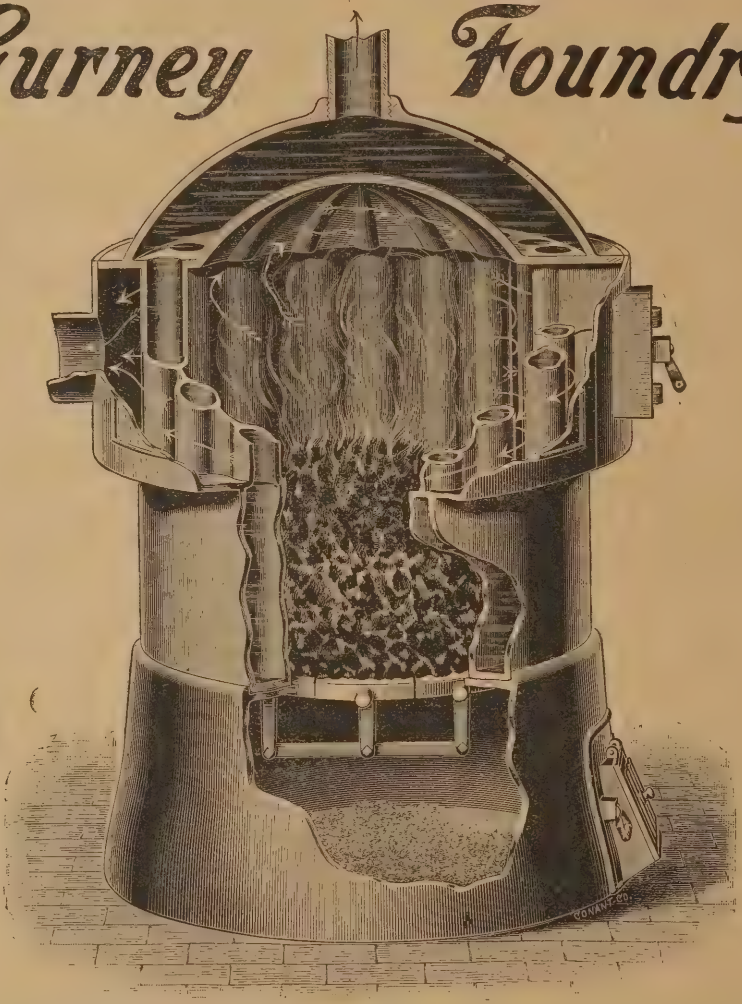
LONDON INSTITUTION.—Mr. Lewis F. Day on "Stained Glass." (Illustrated.) 5 p.m.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Business Meeting at 8 p.m.

Tuesday, December 5.

GLASGOW ARCHITECTURAL ASSOCIATION.—Smoking concert.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. H. Norman Leask on "Difficult Foundations and Substructions." 8 p.m.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Wednesday, December 6.

INSTITUTE OF SANITARY ENGINEERS.—Election Committee at 2.30 p.m. General Purposes Committee at 3.30 p.m.

RUSKIN SOCIETY OF BIRMINGHAM.—Rev. A. Jamson Smith, M.A., on "Ruskin as an Aid to the Lover of Art." 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Council Meeting at 7 p.m., and Students' evening.

SOCIETY OF ARTS.—Mr. Joseph Cash on "Artificial Silk." 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

EDINBURGH ARCHITECTURAL SOCIETY.—Mr. William M. Page on "Notes on Art." 8 p.m.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.—Ordinary Meeting of members at 8 p.m.

Thursday, December 7.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: The Upper Limb."

INSTITUTION OF ELECTRICAL ENGINEERS.—Meeting at 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

Friday, December 8.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. D. Bennett Dobson on "Graphic Calculations." 8 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. C. R. Ashbee on "The Co-operative System among the Mediæval Builders in England." 6.45 p.m.

INSTITUTION OF MECHANICAL ENGINEERS.—Ordinary meeting. Nominations for annual election of officers. 8 p.m.

Saturday, December 9.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—(Newcastle-upon-Tyne.)—Council meeting at 1 p.m. General meeting at 2 p.m.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

GREENWICH.—Accepted for pulling down and rebuilding the back additions of 80, and 82, Greenwich-road, S.E., and carrying out certain drainage work in connection therewith, for Mrs. M. A. Chalk, Caterham, Surrey. Mr. J. Halsted Waterworth, architect and surveyor, 281A, Queen's-road, New Cross Gate, S.E.:—

S. R. Best, Brockley, S.E.	£252 10

LONDON.—For works at "The Prince Alfred," Canning Town, E. Messrs. Foulsham and Herbert Riches, architects, Bromley-by-Bow and 3, Crooked-lane, King William-street, E.C.:—

A. Webb	£345 0	T. H. Jackson*	£316 10
Osborn and Sons ...	321 0	Sheffield Bros.	315 0

* Accepted.

LONDON.—For works to cottage, boundary wall, &c., Clyde-place, Leyton, E. Messrs. Foulsham and Herbert Riches, Bromley-by-Bow and 3, Crooked-lane, King William-street, E.C.:—

Osborn and Sons ...	£219 0	P. Hart	£200 0
E. F. & T. S. Walker	204 8	A. Webb (accepted)...	174 17

LONDON.—For erecting saw mills, stables, and foreman's cottage at Albert Wharf, Wandsworth Bridge, for Mr. E. H. Johnson. Mr. J. A. J. Keynes, architect, 5, Gledhow-terrace, South Kensington:—

Minter	£5,320	Kearley	£4,932
Turtle and Appleton ...	4,966	Hammond (accepted)	4,554
Holdstock and Mould	4,940		

LYME REGIS (Dorset).—For the construction of sewers, Cobb district, for the Town Council. Messrs. Witts and Phillott, engineers, Cheltenham. Quantities by engineers:—

J. Jones	£1,813	S. Ambrose, Bath* ...	£1,646

*Accepted.

NEW CROSS AND GREENWICH.—For sundry repairs and decorative work to property at New Cross and Greenwich, on Martin Estate. Mr. J. Halsted Waterworth, surveyor to the estate, 281A, Queen's-road, New Cross Gate, S.E.:—

S. R. Best	£196 18	W. Falkner	167 15
W. H. Smith	181 4	A. R. Burge	133 0

ROMILEY.—For alterations and additions to the Grey Horse Inn, for Messrs. Gartsides, Ltd., Brookside Brewery, Ashton-under-Lyne. Messrs. J. H. Burton and J. A. Percival, architects, 150A, Stamford-street, Ashton-under-Lyne:—

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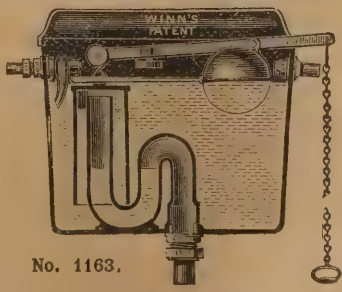

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Bills of quantities have been prepared for the use of Builders by Messrs. CORDEROY, SELBY, and CORDEROY, of 21, Queen Anne's-gate, and Messrs. FOWLER and HUGMAN, of 9, Craig-court, and, together with forms of Tender, may be obtained at the Office of Works on payment of One Guinea. The sums so paid will be returned to those persons who send in Tenders in conformity with the conditions specified below.

The Commissioners do not hold themselves responsible for the accuracy of the quantities, nor do they bind themselves to accept the lowest or any Tender.

Tenders are to be delivered before TWELVE o'clock noon, on Friday, DECEMBER 15th, next, addressed to The Secretary, H.M. Office of Works, &c., Storey's-gate, London, S.W., and endorsed "Tender for Foundations &c., Royal College of Science."

H.M. Office of Works, &c.
November, 1899.

THE ISLE of THANET JOINT HOSPITAL BOARD.

ERECTION OF INFECTIOUS DISEASES HOSPITAL.

TO CONTRACTORS.

The Isle of Thanet Joint Hospital Board are prepared to receive TENDERS for the ERECTION of an INFECTIOUS DISEASES Hospital for their district.

Those desirous of Tendering can inspect the drawings and specifications at the office of the Joint Architects, Messrs, LANGHAM and OSBORNE, 70, High-street, Ramsgate, between the hours of TEN a.m. and FOUR p.m., any day (excepting Saturday).

The quantities, conditions of contract, and forms of Tender can be obtained from the Surveyors, Messrs. FRANKLIN and ANDREWS, No. 25, Ludgate-hill, E.C., upon payment of a fee of Ten Guineas, which will be returned on receipt of a bonâ fide Tender.

Sealed Tenders, to be signed and endorsed "Tender for Infectious Diseases Hospital for the Isle of Thanet Joint Hospital District," are to be delivered or posted to my office, on or before DECEMBER 18th next.

Any Tender not on the prescribed form will not be considered.

The Board do not bind themselves to accept the lowest or any other Tender.

A. BROMLEY BURROWS, Solicitor,
Clerk to the said Board.
No. 72, High-street, Ramsgate,
November, 1899.

HORSHAM SCHOOL BOARD.

TENDERS are invited for the ERECTION of a SCHOOL at Victory-road for the Horsham School Board.

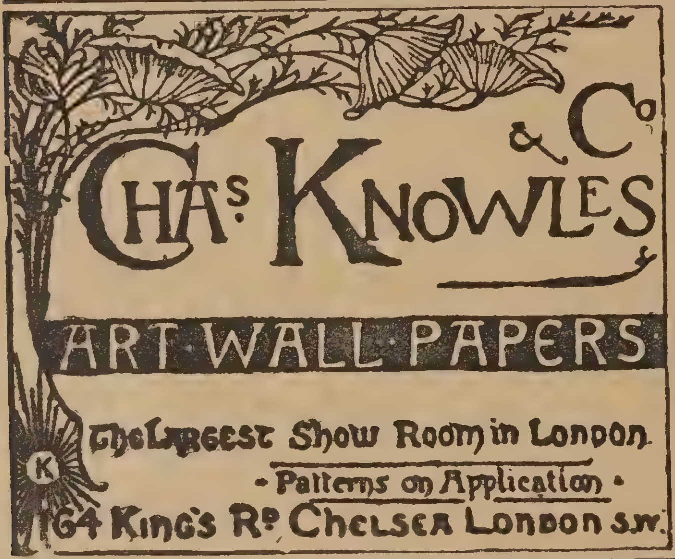
Plans and specifications may be seen at the Offices of the Architect, Mr. WILLIAM BUCK, North-street, Horsham, between the hours of TEN o'clock a.m. and FIVE o'clock p.m.

Bills of quantities will be supplied on payment of a deposit of One Guinea, which will be returned upon the receipt of a bonâ-fide Tender for the works.

Sealed Tenders must be delivered to the undersigned not later than TWELVE o'clock, on MONDAY, DECEMBER 4th, 1899.

The Board do not bind themselves to accept the lowest or any Tender.

FREDK. W. BUTLER, Esq.
West-street, Horsham, Clerk to the School Board.
November, 1899.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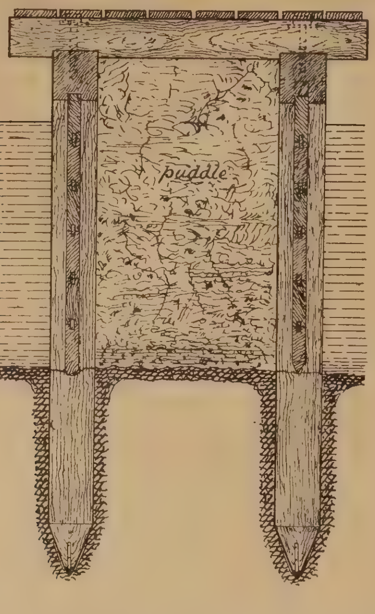


FIG. 1.—TRANSVERSE SECTION OF A SMALL DAM.

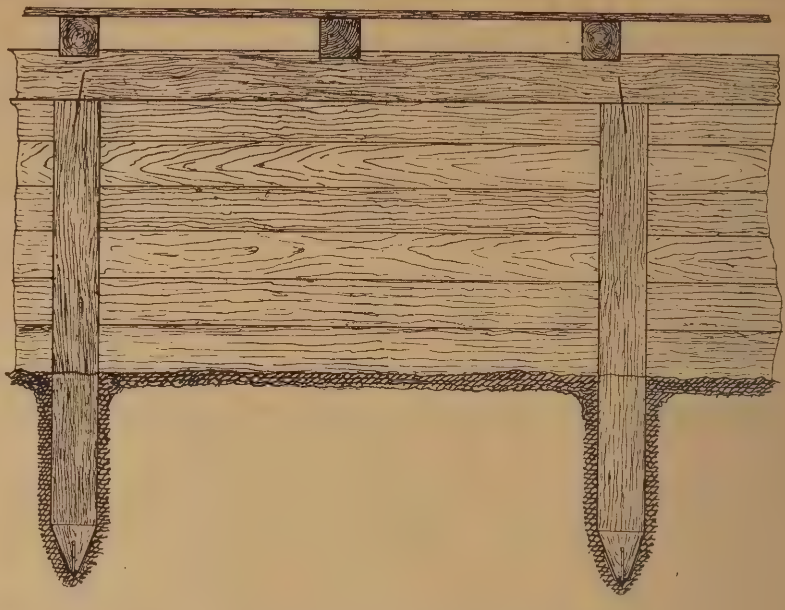


FIG. 2.—LONGITUDINAL SECTION OF A SMALL DAM.

THE CONSTRUCTION OF COFFER-DAMS AND CAISSONS.

BY GEORGE ELLIS.

COFFER-DAMS are water-tight walls of timber and clay used for the purpose of excluding water from the site of foundations, bridge piers, embankment walls, &c., during their building. They are formed by driving two or more parallel rows of timber piles at various distances apart, proportionate to the pressure of water around the proposed site, and filling the space enclosed between the rows with a mass of puddle, that is, well kneaded and rammed clay. When the dam is completed the space enclosed is pumped dry, and the bottom levelled and solidified, either by ramming or concreting, after which the foundations are made and the superstructure carried up. The details in the construction of dams vary somewhat, according to circumstances and the ideas of different engineers, but the main arrangements are the same in all, and are clearly shown in the accompanying illustrations. One of the chief difficulties to overcome is the tendency of the puddle to burst out the sides of the dam on account of its swelling, this being caused by the infiltration of the water, aided by the latter's varying resistence as it rises and falls. At first sight it would seem an easy matter to counteract this by transverse ties and struts, but it is found in practice that all such interior timbering is a source of weakness in the dam, inducing leakage and forming conduits for the water into the enclosure, in consequence of the impossibility of getting the clay well punned beneath them. To a lesser extent this danger is also present when iron tie-rods are used, and precautions have to be taken to prevent it; but as these rods are easily applied and more effective than timber, they are most frequently used below the water level. Where possible, they should not be taken right through the dam continuously, but stopped upon one of the inner walls, as shown in Fig. 3; the heads of the bolts and the nuts should seat on large iron washers, with pieces of vulcanised rubber or greased leather interposed between them and the timber blocks which take the bearing. Figs. 1 and 2 are illustrations of a small dam, suitable for use in a shallow river. It consists of two series of piles, 10in. by 10in., connected by long heads of similar timber, into which the piles are either notched or tenoned and secured by timber dogs. The two walls are tied together by crossheads of 9in. by 9in., notched over the longheads and fixed to them by screw bolts; these are surmounted by a floor of 3in. deals, affording a convenient platform from which to shoot the puddle and subsequently to receive the material for the foundations. The piles are spaced about 9ft. apart, and the voids between them filled in with horizontal sheeting, consisting of 3in. by 9in. deals with their edges either grooved to receive tongues or cut to a bird's-mouth and V-section. This sheeting is secured at each end by inserting it in grooves cut in the sides of the piles, or, where the latter are of small scantling, in grooves formed by bolting two streaks on the face of the pile; both these methods are as shown in Fig. 4. The first board dropped in has its lower edge bevelled off to a sharp arris, and when it reaches the bottom is knocked hard down with pieces of timber until its sharpened edge is bruised into the irregularities of the bottom. It is then removed by means of hooks; the indented parts are cut away until the edge roughly fits the bottom, and it is then sent down again, this time with a tongue in its upper edge. The remaining sheets are then entered successively in the grooves and knocked hard down until they reach about an inch above the shoulders of the piles, this part entering a groove in the long heads. Temporary strings are nailed to the sides of the piles near their heads during this operation to keep them in place until a sufficient number of bays, to be covered by a length of heading, are filled in, after which the latter is fixed and the strings removed.

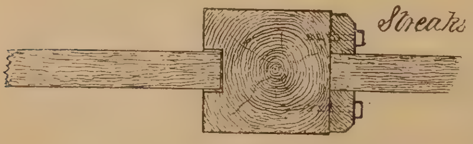


FIG. 4.—DETAIL OF PILE IN FIG. 2.

Fig. 3 is a perspective view of a portion of a large coffer-dam (the puddle being omitted to show the construction), such as would be required in deep waterways, where there is considerable difference between the levels of the tides. It consists of four rows of whole timber piles, 12in. by 12in., tied together with pairs of half-timber walings (W) 12in. by 6in. and connected by transverse tie-bolts. The walls are arranged at 5ft., 6ft. and 8ft. apart respectively, and are driven 9ft. below the river bed. The centre of the dam is carried up 3ft. above high-water level, and the body 4ft. above low-water level. The centre is supported from the rear by inclined and horizontal struts, either from the embankment or the opposite wall of the dam. This construction is commenced by driving guide piles, about 12ft. apart, in true alignment and in vertical planes, around the site, then bolting on the walings W. at the head and just above the lowest water-level; between these the intermediate or sheet piles are driven, being all sawn straight on their contiguous faces, laid together, fitted and marked, and inserted in corresponding order, so that they shall form tight joints. The last pair in each bay to be driven, which should be the middle pair, are cut tapering in opposite directions, so that they shall spread out in driving, and wedge all the others up closely. After the piles are all driven, and before the puddle is shot, all the walings on the insides of each dam that can be dispensed with are removed; these are indicated in Fig. 3 by being unshaded. The remainder below low-water level have their under edges adzed off to facilitate punning. Should the enclosed site be extensive, it might be found difficult to get adequate support for the raking shores, and in such a case counterforts, or transverse walls of piles, would have to be driven across the interior of the dam and braces taken from these horizontally to strut the intermediate portions.

It is usual to make the total width of a dam equal to the mean depth of the water up to 10ft., and for greater depth than this to add 4in. to the width of the dam for each additional foot of water. The length of the piles will depend upon the nature of the ground and the height of the dam above high water; generally, where there is a sound bottom, one third of the greatest depth of water will be a sufficient depth to drive the piles below the bed. A sluice should be formed in all dams in tidal ways to provide against a sudden rise in the water, which may necessitate the flooding of the enclosure to prevent the dam being washed away. These sluices are square conduits made of planking running through the dam at low-water level and closed at one or both ends by sliding shutters. Provision is made for them by driving two pairs of grooved piles, about 2ft. apart in the clear, on opposite sides of the dam near its middle; these are the guides in which the gates work. Two filling piles are driven tightly between them to the low-water level and their heads cut off level and grooved out 2in. deep, an auger hole having been previously bored through each to facilitate the operation. The sluice is next formed of 3in. planks bolted together and built in tightly between the opposite piles. It is afterwards well punned with clay. Then the inside of the gate piles above the sluice is covered with similar planking, fixed horizontally with screw bolts up to the level of the top. The gates, about 2ft. 4in. square, are formed 3ft. thick of oak or elm plank, bolted to cross battens, and to them are fixed screwed castings, which a long iron rod, with a screw at one end and a bevel wheel at the other, connects with a winch on the top of the dam; in this way the gates are raised or lowered as required.

When the bottom is covered with a great depth of silt it is preferable, to insure the stability of the dam, to widen its base by increasing the number of walls, rather than by driving them deeper into the bottom; and this may also be aided to some extent by battering the outer and inner walls about ¾in. to the foot in depth. Battered piles, however, are very difficult to drive accurately, the piles in some soils having to be frequently withdrawn and corrected. Piles in hard ground are considered sufficiently driven when they only advance ¼in. per stroke of the ram, when the average "go," as the movement of the pile is termed, throughout the drive has been 2½in. per stroke. The pile must be carefully watched when it goes hard, to see that it is not shattered or damaged by the ram, as such injury may subsequently cause serious leakage. The sound of the blow is a good indication of the effect. It should be a dead thump ceasing immediately the blow has been struck. If there is any cracking, hollow, or trembling sound the driving should be stopped at once. All pile heads should be fitted with wrought-iron hoops of suitable diameter and 1in. thick by 3in. wide. The head of the pile is chamfered off about 9in. down (as shown at page xxvi., No. CCXXXVIII.) to just fit the inside of the ring, which is entered and driven into place by the ram when the pile is arranged in position for driving. This method ensures a perfect fit. When the driving is finished the head of the pile is cut off and the ring used again, the life of a ring being for about 300 piles. Of the timbers suitable for piles, good, sound memel red fir is most frequently used. When very long piles are required, pitch pine (southern) or red cedar is chosen, but recently, in consequence of the tendency of the former to split under the ram, due to incipient cup shakes, the Australian karri-karri has been employed. For more permanent piling, such as pier heads, wharves, jetties, &c., teak or greenheart (the latter for sea-water) is the best to employ; it should be impregnated with creosote about 8lbs. to the cubic foot.

Caissons. When the site of the proposed building is of small area, and the depth of water is great, or in cases where the nature of the soil, such as a deep bed of sand, would render it almost impossible to keep the well of a dam dry, the foundations are often made by means of a caisson. This is a watertight box of suitable dimensions to hold the masonry of a pier and its footings (and also the workmen engaged in building it), which is floated over the site of the proposed pier, &c., that has previously been dredged and levelled. It is anchored between two piles at each end of the site, and iron angle guides are bolted to the sides of the caisson, on each side of the piles; these allow of downward movement, but keep the caisson centrally over the site. The building is now commenced and carried on inside the caisson directly upon its bottom, which is constructed of thick elm planking. This is made detachable, and when, as the work proceeds and the weight of the material causes the caisson to sink to the bottom, the bolts are withdrawn, the sides float upwards leaving the bottom to act as a permanent foundation. Before the water is admitted it is advisable to send a diver down to examine the foundation to see if any packing is required.

New York's Projected Tunnel.—A tunnel is to be made from the City Hall to the northen boundary of New York, but it will take ten years to complete. Trains are to be run in it at the rate of sixty miles an hour, which will bring one end of the city within twenty minutes of the other, and there will be no dust or smoke, as electricity will be the motive power. Tenders are now being advertised for the work.

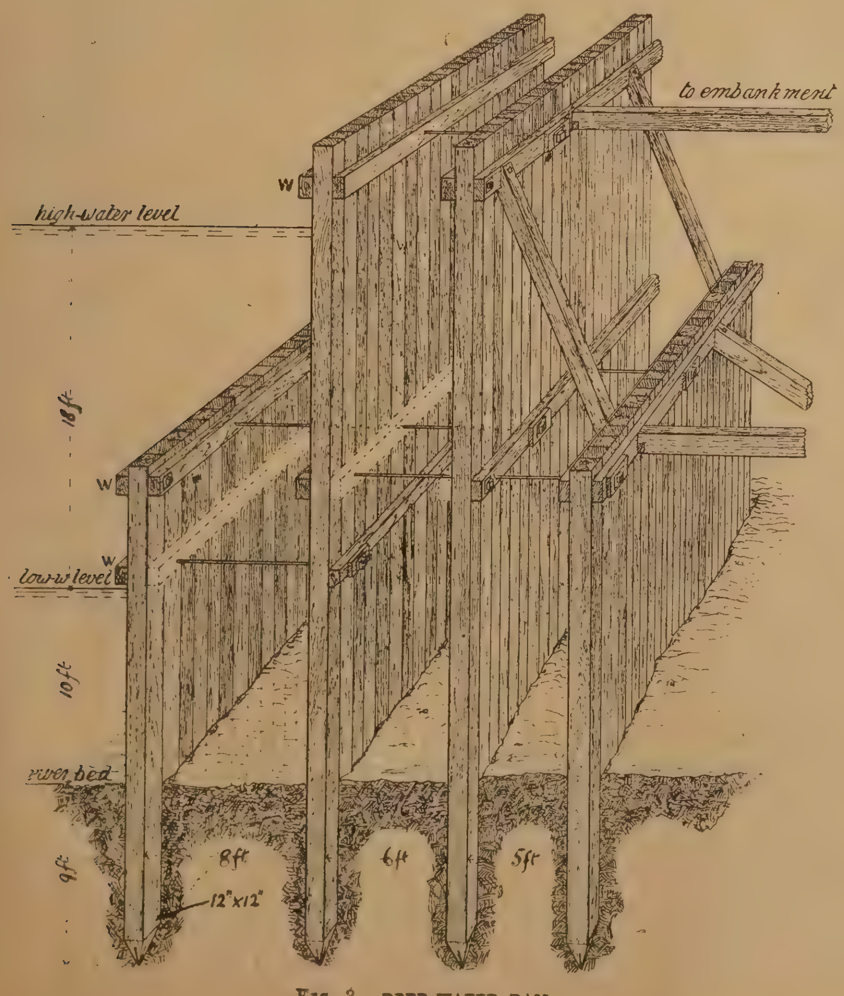


FIG. 3.—DEEP-WATER DAM.

Masters and Men.

Scotch Steel Trade Dispute.—In reply to the men's demands for an immediate advance of 5 per cent. in wages, the Scotch steelmasters have replied that they will grant 2½ per cent. increase on December 1st, and a second 2½ per cent. on January 1st. The men's officials have refused the offer.

United Operative Plumbers.—In his report to the United Operative Plumbers' Association of Great Britain and Ireland for the third quarter of this year, Mr Cherry says there had been an increase in the membership of 130. The total expenditure was £3,307 18s. 9½d., and the chief items were:—Travelling benefits, £238 4s. 3d.; sick benefit, £955 15s. 8d.; superannuation benefit, £191 17s.; strike pay, £905 9s. 1d.; and funeral benefit, £257 17s. 6d.

A General Strike in the Bradford Building Trade is now pending in consequence of the boom of trade. The operatives' societies are in harmony in making the demands, while the masters seem disposed to resist, or at least to temporise. The plasterers and labourers have taken the initiative by demanding advances of 1½d. and 1d, from 8½d. and 6d. an hour respectively. Notices have been served upon the masters which will expire on December 31st, and up to the present the conferences held have failed to bring about a satisfactory settlement. With every prospect of unusual activity in the building trades, the outlook is regarded with some degree of alarm. The present schemes on foot include the erection of the Cartwright Memorial Hall, central and district baths, market extensions, electricity works extentions, Town Hall extensions, workmen's dwellings, a new central fire brigade station, a new board school, and other large undertakings, besides the ordinary building operations of the city. The joiners in Bradford are also demanding an advance of 1d. per hour, the present rate being 8½d. The notices in this case expire on May 1st next.

THE NEW SUBWAY.

WHEN a site opposite the Bank of England was granted to the Central London Railway Company for their terminus, it was on the understanding that they should construct a public subway which, besides serving as an entrance and exit to the station, would connect with all the thoroughfares in the locality. Seven independent staircases lead to the subway, which is 15ft. wide and 10ft. high, and runs round a large central hall in which the company's booking offices will be situated. In this hall there are five iron-lined shafts, 60ft. deep, in which lifts will work; these have been supplied by the Sprague Elevator Company, of New York, and it will be remembered that they were the subject of some controversy a short time ago. The smallest lift will carry fifty persons, and the largest 100. The hall is covered by a steel trough roof covered with a 2in. layer of concrete and a topping of asphalte, which of course forms the road surface over which the great streams of traffic around the Mansion House pass. Glazed white tiles have been used for lining the subway. The work, which has been carried out most successfully, presented many great difficulties, not the least of which was that of dealing with the great underground mains; for instance, there was a 30in. gas main, a 24in. gas main, two 24in. water mains, and a main containing hydraulic pressure of 800lbs. Before these could be touched another subway had to be made to receive the new service pipes, and below all was a brick sewer 8ft. wide and 7ft. high, which could not, however, be diverted, and now runs between two of the lift shafts. The subway has been designed and carried out under the supervision of Mr. Basil Mott, and is certainly a great success and a decided addition to the brilliant list of the engineering achievements of the present century.

Builders' Notes.

A Crane Accident.—On Thursday last a twenty-ton travelling crane on the end of the Admiralty Pier Extension at Dover toppled into the sea.

The glazing at the Nottingham Central Station is being done by Messrs. Mellowes and Co., of Sheffield, on their patent "Eclipse" system.

Labourers' Cottages.—In their issue for November 24th the "Daily News" published a perspective, some plans and a section of a country labourer's cottage, estimated to cost £100. One living room, three bedrooms, a scullery, store, and closet are provided.

Paper Roofs.—A thick tarred pasteboard is now made by the Tokio Card and Pasteboard Co., the largest of its kind in Japan, as a substitute for shingles for roofing. It has a good sale, being 50 per cent. cheaper and more easily managed than the wooden article.

For letting Houses before obtaining certificates from the borough surveyor that they were fit for human habitation, Thomas Brown, a builder, was fined last week at Barrow £3 (£1 in respect of each house) and costs; Councillor J. H. Neal was fined £2 and costs for a similar offence.

The "Princess" Gas Fire, patented and made by Messrs. R. and A. Main, Limited, of London, Glasgow, Falkirk, Tottenham, Manchester, Bristol and Birmingham, will fit any grate and is most suitable for offices, &c. It gives a quick bright fire and a healthy heat with a low consumption of gas, and can be hired from gas companies at the rate of 1s. 6d. per quarter.

150,000 tons of rock was blown up recently at the Bonawe granite quarries, 12,000lbs. of gunpowder being used. "It was a wonderful sight," says one, "to see 250ft. of rock by 150ft. on the surface and 50ft. deep rise gradually for 6ft. or 8ft. and then collapse in a multitude of pieces, some of them weighing from 2,000 to 3,000 tons, and scatter themselves over the floor of the quarry."

At the Slate Merchants' Congress, held last week at Liverpool, Mr. Clement Braby (the president) stated that the association was increasing its membership, and now included about three-fourths of the slate trade of England. The hope was expressed that efforts would be made to federate all the national associations of building trades employers into one organization.

The Birmingham Master Builders' Association held its annual meeting on November 21st, and in the evening held a dinner. The association has now a balance in hand of about £218. Referring to the building trade, Mr. T. G. Price said that one in every seven of the working population of the country belonged to one or another of the various branches, and the employers paid upwards of £60,000,000 a year in wages.

Milne's Syphonic Chimney-top.—In our issue of March 9th, 1898, we drew attention to an appliance designed by Mr. E. P. Milne, of 15, Craven Street, London, W.C., for preventing down-draught and increasing the up-draught in sluggish chimneys. We are pleased to learn that this device has proved to be one of the best inventions for curing a smoky chimney. Mr. Milne is now executing a number of repeat orders—a fact which speaks for itself.

Building in Scarborough.—It is expected that the proposed change to be made in the system of disposing of the ground on Weaponness estate, belonging to the Corporation, will give an impetus to the building of villas on South Cliff, Scarborough. The Local Government Board has given its sanction to the plots being sold for a gross sum, on condition that the Corporation undertakes that all purchase monies received from the sale shall be applied to a fund for the redemption of loans.

Somebody's Fault.—Some new buildings have been erected in Carr Lane, Hull, for the Constitutional Club, and a heavy cornice had been placed in position. Last week this all fell down and was smashed; fortunately, nobody was injured seriously. It has been stated that the work was green, and that the cornice was not sufficiently weighted at the back; but builders ought to know the elements of their business.

A Large Column.—A piece of granite has been quarried in America which, when turned up, will be 54ft. long and 6ft. 3in. in diameter. It will be the first of eight columns which are destined to support the great dome of the Episcopal Cathedral of St. John the Divine, in New York. Two of the eight columns are to be of this size; the other six are to be of the same diameter bnt 52ft. in length. There is now being built for this work a special lathe costing between £3,000 and £4,000. The stone for the General Worth Monument, which was afterwards erected in New York, weighed 175 tons when quarried, but was found to contain a slight defect, and the contractors were obliged to furnish another. This monolith came from the famous Sands Quarry, which also supplied the stone for the Washington Post Office building and other notable structures.

Lancashire Asylums Board. — At the annual meeting of this Board on Thursday last the report of the Finance and General Purposes Committee was adopted. This recommended that £20,000 should be borrowed to meet the cost of making bricks for the new asylum at Winwick, and stated that the sanction of the Local Government Board had been obtained to borrow the following sums:—£21,817 for electric light installation and £8,900 for the new male infirmary at Prestwich; £22,315 for new reception and acute wards, and £4,800 for their furnishing. It was decided to grant £1,337 for erecting and fitting up a laboratory and museum for pathology and bacteriology at Lancaster Asylum, £6,000 for altering and relaying drains and treating sewage at Whittingham, and £7,000 for providing new farm buildings at Winwick Asylum.

London County Council.—At the meeting held on November 21st it was resolved to seek Parliamentary powers to reconstruct for electric traction the tramways between Westminster Bridge Road and Tooting and between Blackfriars Bridge and the junction near "The Horns" at Kennington. This is estimated to cost £251,000. Mr. Shaw Lefevre stated that the Strand widening scheme (by pulling down the Holywell Street houses) was being pushed forward, and the chairman of the Technical Education Board said that a grant of £2,500 a year each had been made for the maintenance of a faculty of commerce and a faculty of engineering at the University of London. The recommendation of the Parliamentary Committee that powers should be sought by a public Bill to allow burial authorities to provide crematoria was adopted, and the Council approved the draft orders with regard to the proposed light railways on Clapham and Kingston Road, New Cross and Eltham, and Archway Road, Highgate.

Letters may be Contracts.—In the High Court of Justice on November 20th the case of Croshaw v. Pritchard and Renwick was heard before Mr. Justice Bigham. The plaintiff was the owner of certain freehold premises in Bermondsey, and the defendants were builders. On August 22nd last, the plaintiff's architects wrote to the defendants stating that their client was about to make additions to his property, and asking for a tender in competition for the work. No quantities would be supplied, and their client did not bind himself to accept the lowest or any tender. Subsequently the specification was sent to the defendants, and on September 14th the defendants wrote to the plaintiff the following letter, which was headed "Estimate":—"Our estimate to carry out the sundry alterations to the above premises according to the drawings and specification amounts to the sum of £1,230." On the next day the plaintiff wrote that he accepted the defendants' offer, but later the defendants wrote to say that they had made an error in their figures, and that under the circumstances they must withdraw their estimate. The plaintiff had the work done by another builder at a price higher than that given by defendants, and he now brought this action to recover the difference in price as damages for breach of contract. The question was whether there was a complete contract binding on the defendants. Their contention was that their letter of September 14th was not a binding tender; that the word "estimate" was advisedly used by them in order to avoid a final and binding agreement, which would have resulted from the use of such words as "we offer to execute the work." Evidence was given by several builders to show that this distinction was always observed in the trade.—Mr. Justice Bigham said that the plaintiff's letter of August 22nd was an invitation to the defendants to send in a tender in competition for the work. That meant that they were to state the price at which they would do the work; and the specification was sent in order that they might have the necessary materials upon which to tender. Then, on September 14th, the defendants sent the letter headed "Estimate," and the question was whether that letter was an offer to do the work at the price mentioned. His Lordship was clearly of opinion that it was. It was said that there was no complete contract, because in the specification there was a blank left as to the time within which the work was to be completed. In the ordinary course a subsequent agreement would be come to as to the time, but if there was no subsequent agreement then the work would have to be done in a reasonable time but the absence of any such subsequent agreement would not have the effect of setting aside the already existing contract. The defendants had made a mistake, and they must abide by the consequences of it. There would be judgment for the plaintiff for £250, with costs.

Surveying and Sanitary Notes.

For sewerage works in the Settle District, £4,699 is proposed to be spent.

For forming thirty-five new streets at Morecambe, at the east and west ends of the town, it is proposed to borrow £9,700.

Liverpool Ladies' Sanitary Association.—At the recent annual meeting of this association, it was stated that during the present year three former students had been appointed to posts as lady sanitary inspectors—one in Liverpool (where there are already three), one in Leeds, and one in London.

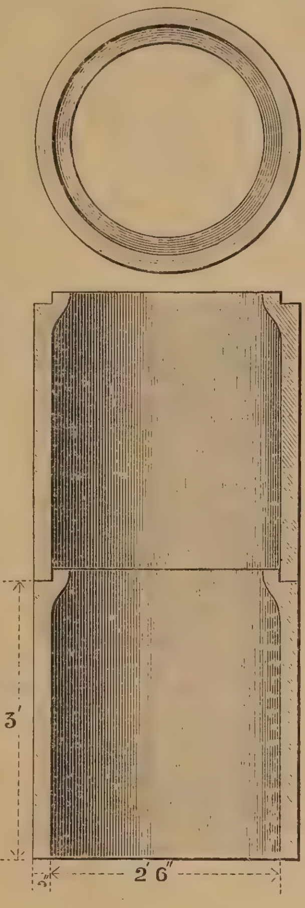
An Unsuccessful Sewage Farm.—Four months ago at Pierrelaye a sewage farm was opened, when the inhabitants were told that their soil would develop the most extraordinary fertility, and that Pierrelaye would become a centre of the market gardening industry. It has, says the Paris correspondent of the "Pall Mall Gazette," become a swamp permeated through and through by sewage. For this result to have been arrived at somebody, of course, must have blundered. It seems to have been the engineers. They affirmed that the soil at the Pierrelaye Farm would be capable of soaking up the 50,000 cubic metres of sewage water that has to be dealt with daily. It turns out that the ground, which is composed in parts of clay and rock, will not do this, and the sewage runs away through underground fissures on to the adjacent land. Water is now supplied to the inhabitants from carts.

Rural Insanitation. — The following is taken from the "Globe":—While at most great centres of population in England due attention is now paid to sanitation, as much cannot be said for the smaller towns and villages. Among them, the standing rule seems to be to do nothing in the way of improvement until some bad outburst of disease occurs. Then, consternation, panic, and hysterical clamour for instantaneous remedies of a thoroughly effectual character make things unpleasant for the responsible authorities. Sometimes, as at Wrexham just now, cottages long since condemned as unfit for human habitation are suffered to remain as death traps for the unwary, without the slightest attempt being made to improve their condition. What the consequences are may be gathered from the painful experiences through which the Chorley district is now passing. Sanitation having been neglected in the past, scarlet fever and typhoid struck such strong roots that 700 cases are now under treatment, and there seems every likelihood of the number being largely augmented. As usual, assurance is given that the authorities are adopting every precaution to prevent the epidemic from spreading. But it would have been more sensible, and far less expensive, to have done that before the outbreak. In most of these cases the main deterrent to official action is the fear of incurring unpopularity by inflating the rates. The older inhabitants see no reason for worrying themselves about remedial measures, without which they and their forefathers always got on quite comfortably, and the authorities fall in with this sentiment by remaining supine until forced to take action by panic.

Trade and Craft.

WELL SINKING.

There is often a great deal of anxiety experienced by those responsible for the sinking of a well, and anything which tends either to facilitate the construction, and so reduce the expense, is likely to receive the support of those connected with this branch of engineering. Messrs. Oates and Green, Ltd., of Halifax, are the sole manufacturers and patentees of a stoneware tube which saves labour and dispenses with wall supports in shaft sinking. We illustrate these tubes on this page. When the diggers have worked downwards a few feet one of the tubes is let into the hole, and it sinks gently and evenly by its own weight until the bottom is reached. After a further depth has been delved another tube is put on the top of the first one, which now sinks lower, the second tube sinking into the previous position of the first one. This process is continued as required to any depth. The tubes are extremely strong and will withstand great pressures, and are intended to remain in the shaft as a permanent support to prevent the earth falling in. The inside projecting rim serves as a support on which the workman can hang his ladder. A large quantity of tubes of 24in., 30in., and 36in. diameter is kept in stock, though other sizes can be obtained to order.



TUBES FOR WELL SINKING.

The proposal to construct tramways at Bournemouth, after suffering strenuous opposition for several years, has now been adopted by the Town Council.

Otley's Waterworks Scheme.—The Otley District Council have decided to promote a Bill in Parliament to enable them to purchase the waters of March Ghyll and its tributaries, in the township of Middleton, and also land for constructing a reservoir. This scheme is estimated to cost £43,000.

Engineering Notes.

For extending the Harrogate electricity works the Corporation propose to spend £28,000.

Electricity for all South Wales is the object of a Bill to be brought forward during the next Parliamentary session by the South Wales Electrical Power Distribution Company. It is proposed to establish generating stations at Panteg, near Pontypool, at Treforest, near Pontypridd, and at Neath, and from there to take cables alongside the railways to practically all the chief towns in South Wales.

The Barrage of the Nile.—Egypt, said Mr. Alderman Bowes at the recent meeting of the Manchester Geographical Society, was watered not by the rain but by the river. Napoleon, when he was in Egypt, proposed to construct dams, but was unable to carry out his scheme. Mehemet Ali began the Rosetta and Damietta dams in 1833. The plan adopted was to build two bridges, one of seventy-one arches and the other of sixty-one arches, with iron gates and sluices. The work was carried out by a celebrated French engineer, and cost nearly two millions. But through bad workmanship it was not a success, and did not hold up much more than half the water that was expected. Constant repairs were necessary, and in 1883 the dams were declared useless, and were put into the hands of Sir Colin Scott Moncrieff for thorough overhauling and repair. This work was completed in 1890, and when reconstructed the dams held up more than four metres of water above ordinary river level. Since Great Britain became the paramount Power in the administration of the finances of Egypt many schemes had been proposed for impounding more of the waters of the Nile. The work now being done at Assouan (590 miles above Cairo) and Assiout (250 miles) Mr. Bowes described in detail. The contractors for these dams were Messrs. John Aird and Co., with Sir Benjamin Baker as chief engineer. The First Cataract at Assouan was now a scene of bustling activity, and much progress had already been made with the work: from 500 to 600 European officials and workmen were employed, and about 10,000 natives. The Nile at this point was about a mile wide, and the channel at low water was broken by a labyrinth of rocky islets and ridges. It was on this foundation that the great dam would be built. It would be over a mile long, 80ft. wide at the base, and the top would be 90ft. above low-water mark. It would be pierced with 180 sluices for the regulation of the flood waters, and would raise the level of the river for 140 miles above the First Cataract. The dam at Assiout would be much shorter and not so high as that at Assouan. About a thousand men were employed on this part of the work. The scheme would not be completed for thirty years, and the total cost was to be £4,800,000.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		BUILDING—		
Dec.	1	Egremont, Cumberland—Additions, &c., to 4 Houses	....	J. Kinney, Little Mill Farm, Egremont.
,,	1	Idle, near Bradford—Brick Kiln	Blake Hill Quarry Company	W. J. Beall, 23, Bank-street, Bradford.
,,	1	Keighley—Warehouse, &c.	W. Summerscales and Sons, Ltd.	W. and J. B. Bailey, 1, Scott-street, Keighley.
,,	1	Leeds—Factory	....	P. Robinson, 72, Albion-street, Leeds.
,,	1	Maryport—Manufactory and Stabling, &c.	Brewery, Ltd.	C. Eaglesfield, Architect, Maryport.
,,	1	Child's Hill—Paint Shop	Midland Railway Co.	Company's Architect, Cavendish House, Derby.
,,	1	Otterbourne, Hants.—Workmen's Cottages	....	Colson, Farrow, and Nisbett, 45, Jewry-street, Manchester.
,,	1	Wakefield—Additions to Cathedral	....	C. Leatham, Walsham How Memorial Fund, Wakefield.
,,	1	Alresford—Vagrant Wards, &c.	Union Guardians	W. H. Moss, Clerk, Workhouse, Alresford, Hants.
,,	2	Canterbury—Cricket Pavilion	Kent County Cricket Club	W. J. Jennings, 4, St. Margaret's street, Canterbury.
,,	2	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
,,	2	Bossington—Pair of Cottages	W. H. Deverell	T. Stopher, 57, High-street, Winchester.
,,	2	Bekesbourne—Alterations, &c., to Sanatorium	Bridge Rural District Council	W. J. Jennings, 4, St. Margaret's-street, Canterbury.
,,	2	Ebbw Vale, Mon.—Altering, &c., Cottage Hospital	Workmen's Doctors' Fund	Lansdowne&Griggs,MetropolitanBank-chbrs,Newport,Mon.
,,	2	Hopgrove, near York—Culvert	....	W. Stead, County Surveyor, Northallerton.
,,	2	Lynton, Devon—Schoolroom, Offices, &c.	National School Building Committee	A. Thorne, 16, Cross-street, Barnstaple.
,,	2	Peebles—School	School Board	R. Wilson, 3, Queen-street, Edinburgh.
,,	2	Preston—118 Cottages	....	Garlick and Sykes, 32, Winckley-square, Preston.
,,	2	Woolston, Hants.—School	School Board	Mitchell, Son and Gutteridge, 9, Portland-st., Southampton.
,	4	Exmouth—Two Detached Villas	....	E. E. Ellis, Architect, Exmouth.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Dec. 4	London, E.—Electricity Supply Station	Whitechapel District Board of Works	M. W. Jameson, 15, Great Alie-street, Whitechapel. E.
,, 4	West Hartlepool—Stables, &c.	Corporation	Borough Engineer, West Hartlepool.
,, 4	Whitby—Public Convenience	Urban District Council	Clerk, Council's Offices, Whitby.
,, 4	Ilford—Retort House, Roof, &c.	Gas Company	Engineer, Gas Works, Ilford.
,, 4	Horsham—School	School Board	W. Buck, Architect, North-street, Horsham.
,, 5	Norwich—Isolation Hospital Extensions	Corporation	A. E. Collins, City Engineer, Guildhall, Norwich.
,, 5	Cowes, I. of W.—Police Station	I. of W. County Council	F. Newman, County Surveyor, St. Thomas-street, Ryde.
,, 5	Bexley—Infants' School	School Board	J. Ladds, 7, Doughty-street, Mecklenburgh-square, W.C.
,, 5	Fleetwood, Lancs.—Shelter	Urban District Council	E. Frobisher, Surveyor's Office, Town Hall, Fleetwood.
,, 6	Sheffield—Stables, Cart Sheds, &c.	Highways and Sewerage Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
,, 6	Cardiff—Operating Room at Infirmary	....	E. Seward, Architect, Queen's-chambers, Cardiff.
,, 7	Carrickfergus, Ireland—Schools and Hall	St. Nicholas' Church Vestry	S. P. Close, Architect, Donegall-square-buildings, Belfast.
,, 7	Keswick—Two Semi-detached Villas	G. P. Abraham	T. Hodgin, 27, Station-road, Keswick.
,, 9	Hither Green, S.E.—Sunday School and Manse	Bible Christian Church Trustees	E. J. Hamilton, Architect, 2, New-road, Brighton.
,, 11	Bacup, Lancs.—Bridge Works	County Council	County Bridgemaster, County Offices, Preston.
,, 11	Lochgelly, Scotland—Tenements	Co-operative Society, Ltd.	J. Murray, 233, High-street, Keighley.
,, 11	Settle—Offices, &c., in Town Hall Buildings	....	H. Ross, Architect, Cannon-street, Accrington.
,, 11	Wavertree, near Liverpool—Buildings	....	E. Kirby, 5, Cook-street, Liverpool.
,, 11	Edmonton—Superstructure of Three Cottages	Urban District Council	G. E. Eachus, Engineer, Town Hall, Lower Edmonton, N.
,, 11	Liverpool—Cottage Home School, &c.	Vestry	E. Kirby, 5, Cook-street, Liverpool.
,, 12	Sligo—Alterations, &c., to Infirmary	....	W. T. Vernon, Secretary, Courthouse, Sligo.
,, 13	Leyton, Essex—Infirmary	West Ham Union Guardians	F. E. Hilleary, Clerk, Offices, Union-road, Leytonstone, E.
,, 14	Wigan—College	Technical College	Briggs and Wolstenholme, Architects, Richmond-terrace, Blackburn.
,, 15	South Kensington—Foundations, &c., to Victoria and Albert Museum.	Commissioners of H.M. Works and Public Buildings.	Sir John Taylor, H.M. Office of Works, &c., Storey's-gate, London, S.W.
,, 15	South Kensington—Foundations, &c., to Royal College of Science.	Commissioners of H.M. Works and Public Buildings.	Sir John Taylor, H.M. Office of Works, &c., Storey's-gate, London, S.W.
,, 16	Shirebrook, near Mansfield—Lock-up	Standing Joint Committee	J. S. Story, Surveyor, County Offices, St. Mary's-gate, Derby.
,, 16	Abingdon-on-Thames—Hospital	Joint Hospital Board	J. G. T. West, Architect, Abingdon.
,, 18	Fleetwood, Lancs.—Schools	School Board	W. H. Haworth, 15, Mawdsley-street, Bolton.
,, 18	Isle of Thanet—Infectious Diseases Hospital	Joint Hospital Board	Franklin and Andrews, 25, Ludgate-hill, E.C.
,, 19	Birkenhead—School Extension	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
,, 20	Farnworth, Bolton—Nurse's Home at Workhouse	Union Guardians	Bradshaw and Gass, 19, Silverwell-street, Bolton.
Jan. 6	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
	ENGINEERING—		
Dec. 2	East Kirkby, Notts.—Waterworks	Urban District Council	W. H. Radford, Engineer, Angel-row, Nottingham.
,, 2	Cockermouth—Laying Water Main	Rural District Council	J. B. Wilson, Engineer, Court-buildings, Cockermouth.
,, 4	Harrow—Electrical Plant	Electric Light and Power Co. Ltd.	A. H. Shaw, Resident Engineer, West-st., Harrow-on-the-Hill.
,, 4	East Dereham—Gas Engine, &c.	Urban District Council	B. H. Vores, Clerk, Theatre-street, East Dereham.
,, 5	South Mimms, Middlesex—Bridge Culvert	County Council	H. T. Wakelam, County Engineer, Guildhall, Westminster.
,, 5	Shepton Mallet, Somerset—Excavating Pipe Trenches	Rural District Council	W. Phelps, Engineer, Croscombe, Wells, Somerset.
,, 6	Mallow—Waterworks	District Council	M. Regan, Clerk, Council Room, Mallow.
,, 9	Edinburgh—Girder Roof	Corporation Gas Commissioners	W. R. Herring, Chief Engineer, Gasworks, Edinburgh.
,, 12	London, S.W.—Hydraulic Machinery, &c.	London County Council	Engineer's Department, County Hall, Spring-gardens, S.W.
,, 12	London, N.E.—Refuse Destructors	Hackney Vestry	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 15	Langport—Reservoir, Pumping Station, &c.	Rural District Council	Bailey, Denton, Son and Lawford, Palace-chambers, 9, Bridge-street, Westminster.
,, 20	Fishguard and Rosslare—Railways	Railways and Harbours Company	Sir B. Baker, 2, Queen-sq.-place, Queen Anne's-mansions, S.W.
,, 30	Panama—Aqueduct	Authorities	Commercial Department, Foreign Office, Whitehall, S.W.
,, 31	Mistretta—Electric Lighting Town	Municipality	Commercial Department, Foreign Office, S.W.
Jan. 2	Llanelly—Reservoir	Urban District Council	H. W. Spowart, Clerk, Town Hall, Llanelly.
,, 3	Concepcion—Drainage and Waterworks	Chilian Government	Commercial Department, Foreign Office, Whitehall, S.W.
,, 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
,, 26	Valletta, Malta—Waterway in Tunnel at Sea-level	....	Superintendent of Public Works, Valetta.
No date.	Chesterfield—Steel Girders, Joists, Hot-water Apparatus, &c.	School Board	Tiltman and Jackson, 29, Knifesmith-gate, Chesterfield.
	IRON AND STEEL—		
Dec. 1	Warrington—Railway Stores	Cheshire Lines Committee	S. S. Barton, Storekeeper, Cheshire Lines, Warrington.
,, 2	East Kirkby, Notts.—Cast-iron Pipes	Urban District Council	W. H. Radford, Engineer, Angel-row, Nottingham.
,, 2	Manchester—Tramway Rails, &c.	Tramways Committee	J. M. M'Elroy, Secretary, Town Hall, Manchester.
,, 2	Dublin—Stores	Grand Canal Company	J. Kirkland, Secretary, James's-street Harbour, Dublin.
,, 4	London, E.C.—Railway Tools and Stores	Burma Railways Co., Limited	Company's Offices, 76, Gresham House, Old Broad-st., E.C.
,, 4	Wimbledon—Unclimable Fence	Urban District Council	C. H. Cooper, Council Offices, The Broadway, Wimbledon.
,, 4	Swansea—Stores, &c.	Harbour Trustees	Engineer, Harbour Offices, Swansea.
,, 5	Dublin—Railway Stores	Midland Great Western Railway Co.	General Stores Department, Broadstone Station, Dublin.
,, 5	London, E.C.—Railway Stores	South Indian Railway Co., Ltd.	Company's Offices, 55, Gracechurch-street, E.C.
,, 6	London, N.—Railway Stores	Great Northern Railway Company	— Wales, Stores Superintendent, Doncaster.
,, 7	Dublin—Various Stores	Steam Packet Company	Secretary, 15, Eden-quay, Dublin.
,, 13	Dublin—Stores	Port and Docks Board	N. Proud, Secretary, Port and Dock Office, Westmoreland-street, Dublin.
,, 13	Margate—Stores	....	F. Stanley, Waterworks Office, Municipal-buildings, Margate.
Jan. 6	Roscommon, Ireland—Water Mains	District Council	C. Mulvaney, Engineer, Roscommon.
	ROADS AND CARTAGE—		
Dec. 1	East Molesey—Street Works	Urban District Council	J. Stevenson, Council Offices, Walton-road, East Molesey.
,, 1	Meriden, Coventry—Stone	Rural District Council	A. Seymour, 11, Priory-street, Coventry.
,, 2	Preston—Street Works	....	Garlick and Sykes, 33, Winckley-square, Preston.
,, 2	Worcester—Stone, Gravel, &c.	Corporation	T. Caink, City Engineer, Guildhall, Worcester.
,, 2	Chingford—Street Improvements	Urban District Council	W. Stair, 14, The Parade, Chingford.
,, 4	Morecambe—Street Works	Urban District Council	J. Bond, Surveyor, Council Offices, Morecambe.
,, 4	Nottingham—Granite Setts	Tramways Committee	A. Brown, City Engineer, Guildhall, Nottingham.
,, 4	Richmond, Surrey—Making-up Road	Town Council	J. H. Brierley, Borough Surveyor, Town Hall, Richmond.
,, 5	Horsham—Flints	Rural District Council	W. Dengate, 58, Park-street, Horsham.
,, 6	Birkenhead—Road Works	Corporation	C. Brownridge, Borough Surveyor, Town Hall, Birkenhead.
,, 6	London, S.W.—Making-up and Paving Street	Fulham Vestry	C. Botterill, Surveyor, Town Hall, Walham Green, S.W.
,, 9	Worcester—Horse Hire, &c.	Corporation	T. Caink, City Engineer, Guildhall, Worcester.
,, 11	London, N.—Road Works	Finchley Urban District Council	C. Roberts, Bibbsworth House, Church End, Finchley, N.
,, 12	Cleethorpes, Grimsby—Road Works	Urban District Council	E. Rushton, Surveyor, Poplar-road, Cleethorpes.
	SANITARY—		
Dec. 1	Bolton, Lancs.—Sewer and Outfall Works	Corporation	W. J. Lomax, 11, Fold-street, Bolton.
,, 2	Newcastle-upon-Tyne—Collection of Refuse	Sanitary Committee	City Engineer, Town Hall, Newcastle-upon-Tyne.
,, 4	Bournemouth—Sewers	....	F. W. Lacey, Engineer, Municipal Offices, Bournemouth.
,, 4	Leatherhead—Sewerage Works	Urban District Council	F. Beesley, 11, Victoria-street, Westminster.
,, 4	Hendon, N.W.—Sewerage Works	Urban District Council	S. S. Grimley, Public Offices, The Burroughs, Hendon.
,, 5	Bury, Lancs.—Sewering	Rural District Council	C. C. Hooley, 34, Brazennose-street, Manchester.
,, 6	Morecambe—Sewerage Works	Urban District Council	Beesley, Son & Nichols, 11, Victoria-st., Westminster, S.W.
,, 8	Meltham—Sewers	Urban District Council	J. B. Abbey and Son, 34A, New-street, Huddersfield.
,, 9	Cheltenham—Sewerage Works	Corporation	Borough Surveyor, Municipal Offices, Cheltenham.
,, 11	Fulwood, Preston, Lancs.—Sewers, &c.	Urban District Council	W. Taylor, Engineer, Council Offices, Fulwood, Preston.
,, 14	London, S.E.—Drainage Works, &c., at Infirmary	St. Olave's Union Guardians	Newman and Newman, 31, Tooley-st., London Bridge, S.E.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Dec. 1	Bury, Lancs.—Infectious Diseases Hospital	£100, £50, £25	Borough Engineer, Corporation Offices, Bury.
,, 15	Lymm—Council Chamber and Offices	£25, £15	W. Mullard, Clerk to Urban District Council, Lymm.
Jan. 31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clerk, Clerk to Burgh Commissioners, Dunoon.
Mar. 12	Belfast—Assembly Hall	£100, £50, £25	W. D. Iakin, 12, May-street, Belfast.

Property and Land Sales.

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Plot of land, frontage 69ft. to Lloyd's-avenue, and 74ft. to Northumberland-alley, area 4,220ft. super.

Particulars, with plans and conditions of letting, can be had at the Mart, E.C.; of Messrs. TURNER, SON, and FOLEY, Solicitors, 101, Leadenhall-street, E.C.; of Messrs. DAVIS and EMANUEL, Architects, 2, Finsbury-circus, E.C.; or of the AUCTIONEERS, 3, King-street, Cheapside, London, E.C.

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SALE DAYS for the Year 1899.
Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, Dec. 7 | Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

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Cabinet Maker's Guide (Bitmead)	3s. 6d.
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DESIGNS, PERSPECTIVES, TRACINGS,
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DIFFICULTIES of PRACTICE advised upon.
F. BRENT, 34, Great James-street, W.C. 32

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Any person manufacturing these Tools will be liable to prosecution for infringement of Patent.

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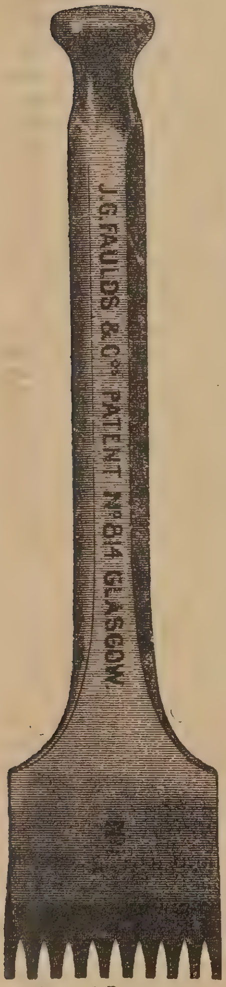
The outstanding merits of the MULTIPLEX STONE-CUTTER are its simplicity and economy. They are simple in construction. The Handles are made with a slot (see below) in which the Cutter is inserted, and the Tool is complete. There are no screws or joints in the Handle to give trouble in fixing or removing the Cutter. They are economical. By the use of these Tools a great saving is effected, all the loss of time, trouble, and expense incurred in getting the ordinary tools sharpened being avoided.

Owing to the handiness and durability of these Tools they are in constant use throughout the whole of the United Kingdom.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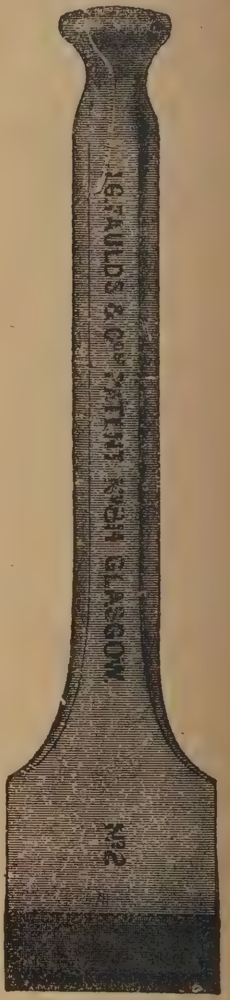
2" Drove, showing Cutter in Slot.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Two sample Tools, with six Cutters, sent carriage free to any address in the Kingdom on receipt of a Postal Order for 2s. to the

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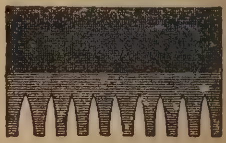

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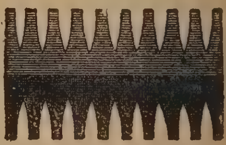

Reversible Cutter, with "Toothed" Edge out.

N.B.—Like every other useful invention, this is imitated, but none are genuine except

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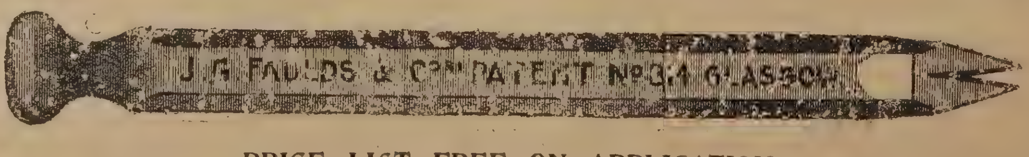
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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS.

December 6, 1899.
No. CCLII.

Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

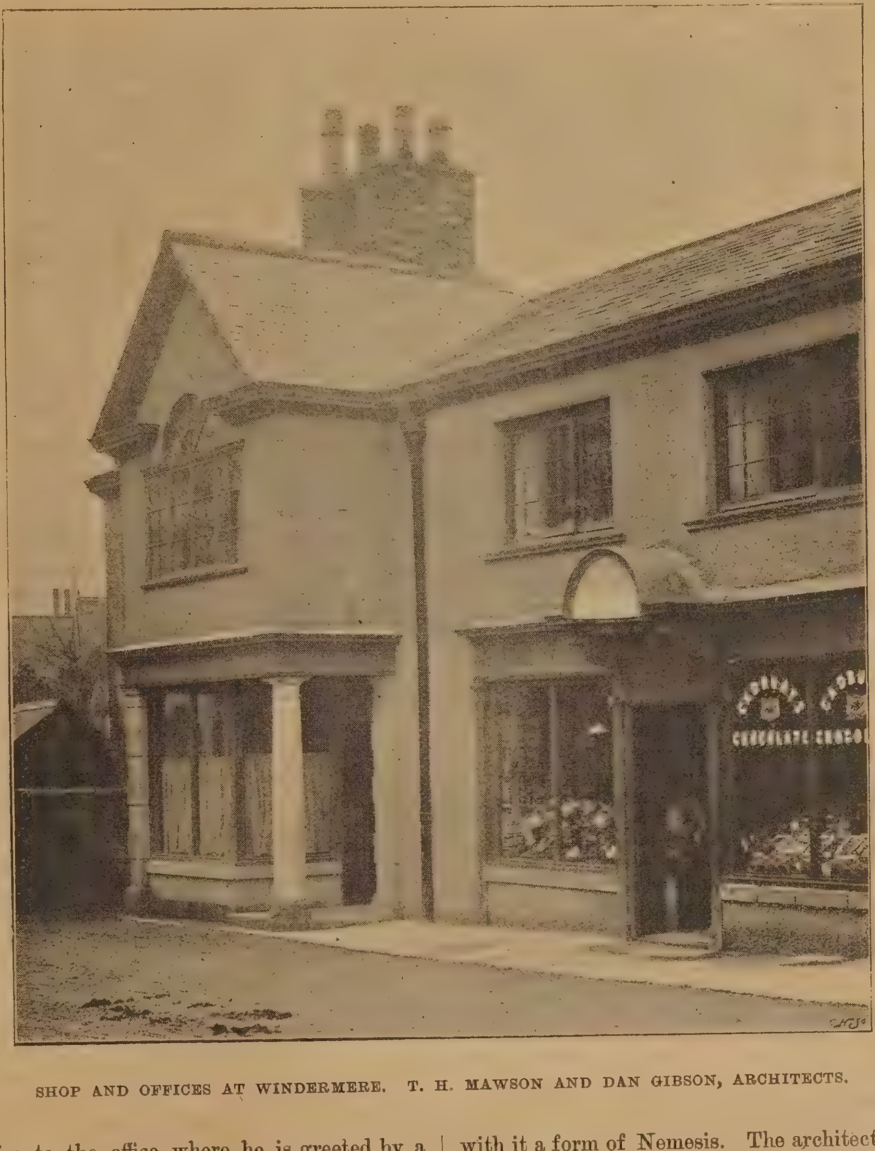
Physical Influences Affecting Design. Sterne tells us that before he sat down to write he always put on a clean shirt and his best silk breeches: this was no idle jest; the witty parson knew the importance of working under the most favourable conditions, and the nicety of his attire is reflected in the daintiness of his language. We might grant the clean shirt, but no one would expect an architect to work in his best clothes; most of us have an ancient and easy coat, shiny, indeed, at the elbows from constant contact with the drawing board, a coat, nevertheless, which we hold in affectionate regard, for, without it, we should consider ourselves but scantily armed to face the problems which we have to encounter; but this is not enough. Besides his magic sword and winged sandals, the Perseus of ancient legend was gifted with one further safeguard, unmentioned, indeed, in explicit terms, but directly implied by his success—perfect health—it is nowhere recorded that he was troubled by a cold, or that his nerves were unstrung. We moderns cannot, of course, expect complete immunity from ills such as these, but we can do much to lessen them if we once appreciate the influence of our own physical surroundings upon our work. Above all things, let him who would design well avoid worry and all that conduces thereto. We must all remain more or less subject to those "whips and scorns of Time" which weighed so heavily on Hamlet; at these it is useless to grumble, they will plague us from time to time be we never so careful, and indeed they will but brace up and invigorate a sturdy nature, for Time brings his revenges. It is the little worries, which might have been avoided, which gall us most. Who can sit calmly to his work while the small speculation which he confidingly made in "Great Bunkers" is dwindling by sixteenths to par, or forget in the studio the embarrassment arising from excessive expenditure in the house.

Another pernicious influence is an itching eagerness to put things straight, to join crusades, social or political. Think of the splendid isolation of Sir Christopher Wren through all the political turmoil and excitement of his time. Unrest of the mind will certainly show itself through the creations of the brain; the design of some men of great talent bears traces of the restless, nervous excitement, stirred up by controversy, and not yet soothed, when they set about their work. Our censors of the press and platform are never tired of reminding us of the depth of our fall, from the high perfection of the artists of the Grecian and Gothic periods; but let them pause for a moment, and contrast the physical surroundings of the architect monk of the thirteenth century with those of the architect citizen of the nineteenth. How can they expect the same quiet dignity and repose to show itself in the buildings of the latter, designed not in the calm atmosphere of the monastery, but in the turmoil of city life? What rest are they likely to find in the work of a man who has hurried from his breakfast to the train which rattles him to the office, where he is greeted by a batch of letters and sundry interviewers, all more or less disturbing, before he can give his attention to design. Even now the ecclesiastical work is, as a rule, better than the domestic, because it is almost always designed under more favourable circumstances. The site is handed over to the architect unfettered by those governing conditions which lead to wrangles over party walls and ancient lights, and the construction remains outside the by-laws and restrictions which shackle the details of the town house, so that he can concentrate all his attention upon the design.

Peace of mind is essential to that restful charm which is so often lacking in modern work. There are experts who will, with considerable accuracy, deduce the character of the writer from the handwriting, and it needs no very subtle power to read from the building the character and temperament of its designer. You may see good sense in the use of the material, clearness of head in the simplicity of the plan, a well-balanced mind in the disposition of the masses, courage in the breadth of the wall spaces, imagination in the treatment of the skyline, wit in the contour of a moulding, and humour in an unexpected piece of carving; or miss some, or all, of these qualities as the case may be.

We speak of an architect being at his best in some examples of his work, and feel a puzzled sense of surprise that, in another case, he fails to give us an equal pleasure; yet the man is the same, his talent as brilliant, only it has been employed under less favourable conditions. Success itself sometimes carries with it a form of Nemesis. The architect is distracted by the excessive demands made on his attention and time; he finds himself unable to give to his later work the careful consideration which won his early success, and his best work is done on the threshold of his career. But if, on the other hand, he, the architect, whether from strength of will or absence of temptation, escape this last disaster, his design, reflecting the firmer purpose and resolve which the lapse of time well spent give to his character, becomes with the advancing years more dignified, more calm. As he grows more self-reliant, he trusts less and less to those quips and conceits which give piquancy to his earlier work, and obtains his effects by a measured peaceful solemnity, becoming to age and mastery.

H. I



SHOP AND OFFICES AT WINDERMERE. T. H. MAWSON AND DAN GIBSON, ARCHITECTS.

What Shall I Study for? The question at the head of this leaderette is one which is sure, sooner or later, to confront an earnest student, and upon the answer given to it depends, to a great extent, his future career. This is particularly the case with the younger man, with his tastes unformed, or at best half formed, and it is to such that advice can best be offered. Even so, the advice must be considered carefully by each individual, that he may apply what are necessarily but general directions to his own special circumstances. Take, for instance, the young man whose relatives have wealth and influence at their command, who is himself artistically inclined, and who is articled to a firm renowned for its good architectural productions. It is natural that such an one should aim at passing the three examinations of the R.I.B.A., and he should sit for the Preliminary at the earliest possible moment, taking the Intermediate and the Final in due course, not hurrying his preparation, but doing it thoroughly; spending what money may be necessary to secure the best instruction possible; travelling, sketch-book in hand, to widen his knowledge, and purchasing at least the nucleus of a first-rate library, both for immediate reading and for reference; all this being done as an investment of time and money which is sure to be well repaid eventually. But, after all, it is the comparative few who are thus circumstanced. A large number more of equally talented men, with equal enthusiasm and intention of succeeding in architectural practice and of producing works of high excellence, have neither means nor time to undergo the long and exacting course of preparation now almost essential for entry to the R.I.B.A. To such the Society of Architects is open, with its one examination well devised and well conducted, which, although quite as severe in itself as the R.I.B.A. Final, does not make such exhausting demands upon the student, there being no testimonies of study to prepare, and only a single examination to pass. Then another large class of students is that to whom the professional rather than the artistic aspect of architectural work appeals. These are likely to become measuring or quantity surveyors rather than architects in the fuller meaning of the term, and for them the Surveyor's Institute has more attractions than either the R.I.B.A., or the S.A. They should enter for the Professional Associates Examination, following it up later on with that for fellowship—in the building section — and their preliminary studies might very well be directed towards the various South Kensington examinations in building construction and geometry. The examinations of the same authorities in architecture and design are much better avoided. Even now a fourth class of students remains to be considered—that of the men who intend to enter the technical branches of the Civil Service. For them the highest preparation possible is essential, and it ought to be directed towards the more severe examinations, such as those for assistant civil engineers in the Admiralty and for assistant surveyors in the Royal Engineers. The fourth page of the daily papers, such as the "Times," "Standard," or "Scotsman," should be watched, on Thursdays only, for announcements, which are made about six weeks in advance, and it will not unfrequently be found that a candidate who has prepared for one of the above-named examinations has made himself fit to compete for something else which happens to be advertised. In all cases, and above all, official particulars of the examination to be entered for should be obtained from headquarters and from nowhere else, and also, where possible, specimens of papers set on previous occasions; and all rules as to the proper mode of filling in application forms, paying fees, &c., must be rigidly adhered to. G. A. T. M.

On Reflection.

Unhealthy Offices. The office is the outcome of the art of writing, the spread of trade, and the congregation of men in towns and cities. In some respects the merchant of those days when the force of brute instinct was feeling the first effects of a growing civilisation was better off than his present-day descendant, for he had the inestimable advantage of breathing in an atmosphere which was unpolluted by soot, and of transacting most of his business in the open air. But though our newest offices cannot, necessarily, reach to the level of their early precursors, it can indeed be said for them that they are a vast improvement on those miserable, dirt-filled apartments with which we are so familiar in the pages of famous novels. But there are still far too many foul, badly-lighted, and evil-smelling, rooms called "offices." To an outsider it would seem the grossest folly for a man to spend the greater part of his waking hours boxed up in a place where the light is bad and the air stuffy; but how many such rooms is the reader not acquainted with? Offices should be as healthy, as free from dust, and as well ventilated as it is possible to make them. It is certainly satisfactory that the modern office is much healthier than the one, for instance, which Dickens describes in his "Christmas Carol," and which, unfortunately, was only one of a prevalent class, and a class whose traces have not yet been obliterated. Principals should make it their aim to see that those who work for them do so under conditions that are not deleterious to their constitutions, or, perhaps, ruinous to their eyesight; and it also behoves all subordinates to see that the rooms provided do not fall into an inhygienic state through the neglect of certain simple requirements which it should be their duty to see complied with daily.

Houses Without Windows. The open-air treatment of consumptives has been given so much prominence latterly that the question has been asked, why, if living in open rooms is good for people of delicate health, it is not even more so for those of sound constitution? In support of this plea it has been urged that, with a greater amount of fresh air, as opposed to living in stuffy and ill-ventilated apartments, the general health would be vastly improved, and a certain "hardness" would be acquired which would be a good safeguard against the many trifling ailments that are to-day so prevalent. As in sanatoria, it is proposed to remove all the window frames and to supply the house with as much air as possible without creating unpleasant draughts, and in considering the idea it is well to remember that "It's indoors, sir, as kills most people." It would certainly be better if we, that is, dwellers in cities more especially, got more fresh air into our lungs nowadays and lived in rooms which did not possess that offensive and oppressive smell which is the result of a silly aversion to the opening of windows and doors. Although we do not think that if the scheme were carried out to any considerable degree, really effective and satisfactory results could be obtained by adapting an ordinary house to the new requirements, yet it is quite feasible to suppose that with specially constructed houses, having corridors and rooms arranged on a definite and scientific basis, much good would obtain. But what would you do? says the outsider. Would you sit in a room which had no windows on a night when the cold wind was whistling around corners and the rain was coming down in one miserable and perpetual downpour? We should think that the most ardent enthusiast for houses without windows would hardly agree to this—with ordinarily constructed houses. But there's the point. Houses can be built and means can be provided to enable persons to live practically in the open air, and yet not experience inconvenience from cold or damp. There are many matters relating to the planning and furnishing of houses which require a good deal of revision, and after a certain time for experience and improvement, this idea of admitting fresh air in larger quantities than is possible by any means of artificial ventilation—for this can never equal natural ventilation—is one which perhaps possesses a great deal more merit than would at first appear to the follower of precedent and the prejudiced enemy of innovation.

Theatre Fires. Following catastrophes in which many lives have been lost there always comes an influx of measures and suggestions for preventing the recurrence of similar disasters, and it is in connection with the three recent theatre fires at St. Helens, Cardiff, and Sheffield that the British Fire Prevention Committee have issued, as one of their publications, a paper by Mr. W. Paul Gerhard, who is the leading authority in the United States in matters of theatre safety. Mention might here be made that the committee itself was the outcome of the deplorable Cripplegate fire two years ago. It is a common supposition that a fireproof building means one built of fireproof materials, but, as Mr. Gerhard points out, a badly-planned theatre might easily prove to be a veritable death-trap in spite of all fireproof construction; good planning is therefore the most important thing of all. It has been found from carefully prepared statistics that theatre fires generally originate on the stage, and it therefore becomes a primary necessity to provide means for effectually shutting off this portion from the auditorium. We feel sure everyone will agree that the arrangement of corridors leading into one another from different parts of the house is to be stringently avoided and every part decentralised as much as practicable. In the paper referred to it is emphasised that, as those in the gallery have the furthest to travel, they should be provided with the greatest facility for exit, though the reverse of this is often the case. As regards the rapidity at which a building can be emptied, it is stated that the 1,500 persons accommodated in the Bayreuth Theatre can leave in just two minutes, while the Gaiety Theatre in Boston (holding 3,000 persons) can be emptied in four minutes. Exit doors for 500 persons or less should be 5ft. wide, and 20in. wider for every additional 100 persons, and they should swing outwards: stairs should be at least 4ft. 6in. wide, and have a landing at the top. Mr. Gerhard advocates external escapes, and particularly mentions that lightning rods should be provided. Efficient watching is, of course, needed, and a periodical inspection of the building. To draw off the smoke, large ventilators should be provided in the stage roof, the doors in the proscenium wall should be of oak, lined on both sides with tin, and automatic sprinklers ought to be included among the fire-extinguishing apparatus. As Mr. Sachs (the chairman of the executive) pointed out at the Amsterdam Fire Congress of 1896, the proper order of preventing fire and panic in theatres was (1) planning; (2) watching; (3) inspection; and (4) construction. The loss of life through fires is so appalling that no effort should be spared to minimise the danger, in which endeavour even the architect of a small house may participate, though necessarily the responsibility which rests on him is trifling when compared with that which devolves on the designer of buildings that are nightly occupied by a large number of human beings.

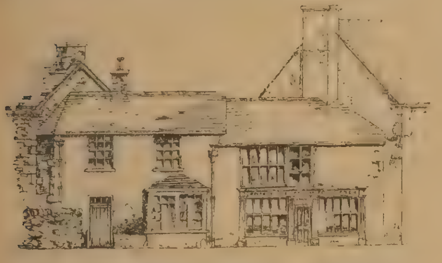
A GARDEN DESIGNER'S HOUSE AND OFFICES.

THE house shown in the accompanying plans and illustrations is erected on an eminence overlooking the whole of the northern portion of Lake Windermere, together with the grand ranges of mountains and numerous surrounding peaks. The site, which is a corner one and of about half an acre in extent, is on the Heathwaite Estate, and is bounded by two roads leading to the villages of Windermere and Bowness.

The house, which was planned to allow of further extension, was designed by Mr. Thomas H. Mawson, in conjunction with Mr. Dan Gibson, the stone being quarried on the site. The chimneys, stabling, and corbelling, and the design generally is in keeping with the older Westmoreland cottages. The panelling in the dining-room is in yellow pine, painted green, above which is a deep stencilled frieze. The limestone head to fireplace is decorated with a conventional treatment of the rose in lead inlay, whilst the firegrate is by the village smith. The furniture and decorations are designed by Mr. Mawson.

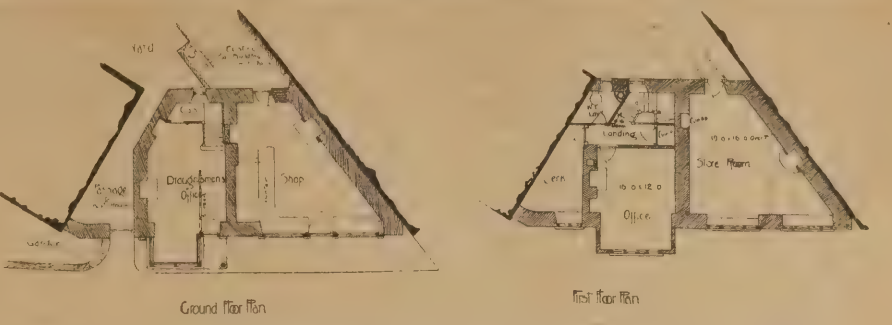
The small garden surrounding the house is quite simple in treatment, breadth and quietness being sought after. It is interesting as belonging to a professional garden designer.

The office was formerly a dwelling house attached to the shop. This portion has been to a large extent rebuilt, whilst the shop has been remodelled, the work being designed by Mr. Dan Gibson and Mr. Mawson. The walls are rough casted and coloured a very light pink, the wood work being painted green. The dressed stonework is of yellow freestone, and the carved brackets to the hood over the shop door are the work of Mr. Arthur Simpson, of Kendal.

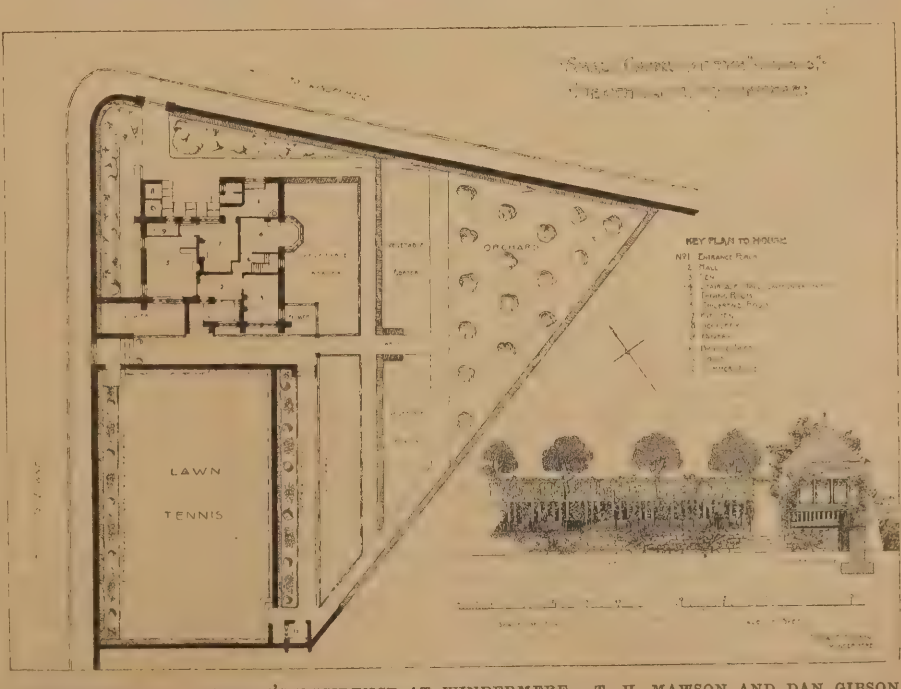


SHOP AND OFFICES BEFORE ALTERATION.

The staircase, which is somewhat unusual in character, has square story posts and newels, carved spads being used instead of turned balustry. The fireplace in the private office has been made by Mr. Pulham to the architect's designs. The settle shown in one of the illustrations is by Mr. Arthur Simpson, who has also made other office furniture.



SHOP AND OFFICES AT WINDERMERE. T. H. MAWSON AND DAN GIBSON, ARCHITECTS.



PLAN OF MR. T. H MAWSON'S RESIDENCE AT WINDERMERE. T. H MAWSON AND DAN GIBSON, ARCHITECTS.

New Church at Enfield.—A handsome new church, dedicated to St. Luke, has been consecrated by the Bishop of London at Enfield. The foundation stone was laid eleven months ago, and the building, of which Mr. James Brooks is the architect, has cost £6,000. It is at present incomplete, only one bay of the nave being built. When finished the new church will accommodate 800 worshippers.

A Rowton House at Hammersmith, W., was opened last week. The area of the site is about an acre and a half. In the construction a million and three-quarter bricks have been used, out of which half a million are glazed to render the work of cleansing more easy. For flooring and other purposes 1,200 tons of Portland cement have been used, and the structure has been strengthened by the employment of 300 tons of steel girder joists. The wood forming the cubicles ran into something like an acre and a half of material, the flooring and paving to two and a half acres, and the piping of various kinds to four miles, while adequate light and air have been secured through the instrumentality of 1,077 windows and 1,158 doors. The architect is Mr. H. B. Measures.

THE LATE LORD LEIGHTON AND THE TATE GALLERY.

SOME HITHERTO UNPUBLISHED LETTERS.

THE Tate Gallery is becoming more and more popular, and as the building has recently received considerable attention by reason of the new extensions (of which we gave particulars last week), it is interesting at this time to refer to certain opinions on architecture in general, and the architecture of the Tate Gallery in particular, expressed by the late Lord Leighton. The building of a new picture gallery was naturally a matter in which the President of the Royal Academy took a keen interest, and on seeing the original design for the building he offered certain criticisms and suggestions to the architect, Mr. Sidney R. J. Smith, through whose courtesy we are now enabled to give the following extracts from the interesting correspondence which ensued.

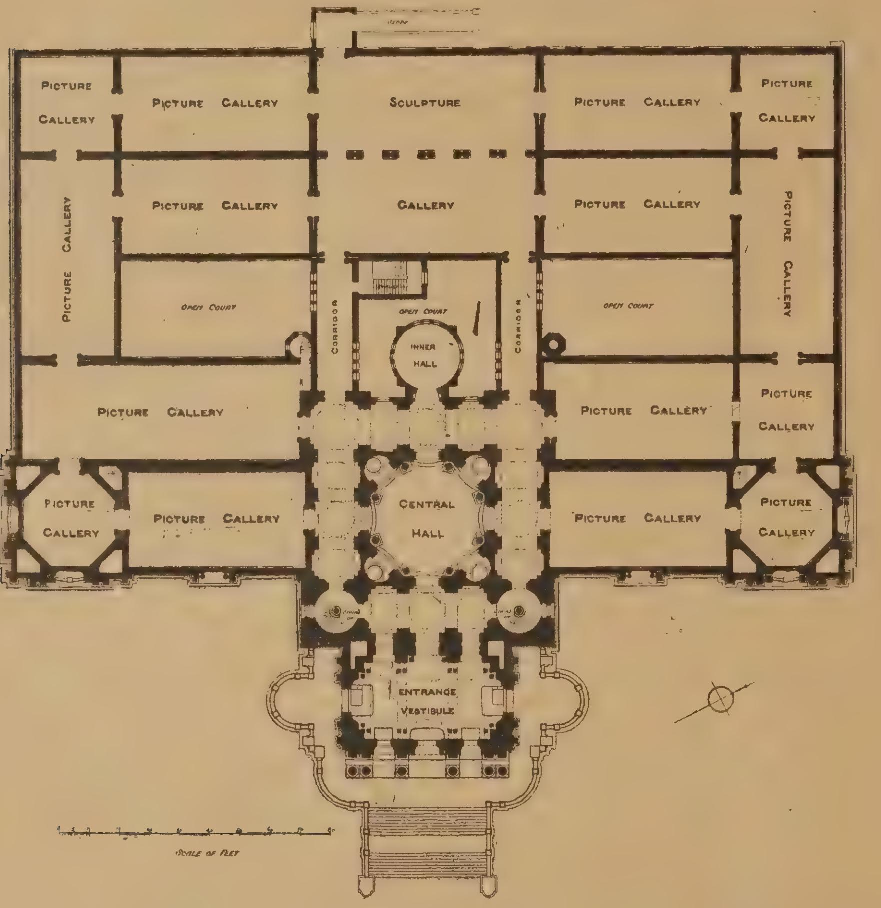
In a letter dated the 7th of May, 1894, Lord Leighton writes:—"I fully appreciate the spirit in which you have taken the criticisms which I ventured to make, on broad and general grounds, on your design for the new British Art Gallery. I may take this opportunity of saying that you were under a wrong impression when you said (on my telling you that I thought that cupolas and turrets were not suited to picture galleries, inasmuch as they were on the one hand *not expressive of* the *purpose of the building*, and on the other hand would cast, however small, considerable shadow over the Exhibition Galleries) that I desired the building to be Greek and not Roman in the character of its architecture. I had no such thought in my mind. With all my profound love and admiration for everything Greek, I should think Greek forms for a London picture gallery in every sense of the word a mistake. (Personally my own inclination would be for some vigorous and free development of Renaissance.) But under all circumstances the first object that an architect should, I think, propose to himself in erecting a building is to make it *expressive of its purpose*, as well as *suited* to it. I have no thought whatever of pressing my advice beyond broad questions of general principle and *fundamental fitness*."

With regard to these ideas of architecture and its treatment in connection with picture galleries, Mr. Smith said in his reply:—"Even if I did not agree with, I should not venture to express any opinion against your's as to 'utilitarianism in art' or 'fitness in building.' But in my original design I cannot but think it looked what it was, a picture gallery—even though it had a 'dome.' You will no doubt remember the Art Palace at Chicago, which was treated in a somewhat similar way (though on rather more Greek lines); also the Amsterdam Galleries, which have towers, and many other buildings for a similar purpose I could name. I need hardly mention the 'sky-lines' of our own National Gallery. I am afraid my drawing of the gallery does not show anything like what is meant by the design and detail. It is extremely difficult (as you know) to make a good drawing of Classic work without great care and finish in the detail, and this in a small sketch is not at all easy."

In Lord Leighton's reply (dated August 3rd, 1896) he says: "I should not revert to the subject of cupolas in connection with picture galleries except to answer what you advance, and that it is very important my meaning should be clear. That domes have occasionally been put upon picture galleries I do not for a moment contest, and, as you very justly say, one need not go further than the present National

Gallery and the schemes which have been promulgated for a new one, to illustrate that fact, but that therefore they have looked, in so far as the domes were concerned at all events, like what a picture gallery should be in *abstract fitness*, is a very different proposition and one to which I cannot accede. I am quite certain that no picture gallery will ever at a future time be built with a dome in France, where the sense of *fitness* is incomparably stronger than with us, or in Germany, where it is not. An edifice with a dome on it is one of the finest forms of building, but the last thing it would suggest to an unbiassed mind is a *casket* for the display of works of art."

Interesting as this correspondence is in itself, it is made doubly so by comparing the design of the Tate Gallery as originally schemed with the one according to which the building was completed. We give a reproduction of each of these designs on one of our inset sheets this week. It will be seen that Lord Leighton's suggestions were eventually adopted, but whether the result was to improve or to spoil the original design is a matter upon which there will doubtless be differences of opinion. The ground plan of the Gallery, with its new rooms, is shown on this page.



GROUND PLAN OF THE NATIONAL GALLERY OF BRITISH ART. SIDNEY R. J. SMITH, ARCHITECT.

Gladstone Memorial at Liverpool.—At the meeting held in Liverpool on Wednesday last (the Lord Mayor presiding), photographs of Mr. Thomas Brock's memorial design were submitted. This design shows a statue, 10ft. high, of Mr. Gladstone in ordinary dress standing on an ornamental pedestal; the total height of the memorial will be 28ft. On two sides of the pedestal are seated figures emblematic of Truth and Justice. On the front is a design in relief indicative of Brotherhood, while the panel on the other side represents Progress. The figures and panels are to be executed in bronze, and the pedestal in grey granite finely dressed. It was announced that upwards of £5,000 had been subscribed towards the memorial, and it was decided to offer Mr. Brock this sum for the execution of the work. The question of the site was not decided.

ELLIPSE BY COMPASSES.*

By R. RAMM.

This article is the result of a discovery by the writer of a simple, practical, and certain system for drawing true ellipses by means of set-square and compasses, or radius rod, an operation hitherto stated to be impossible. The writer was told a few months since by two gentlemen in authority at the Science and Art Department, South Kensington, that it was "quite impossible to do certain things correctly by compasses," the formation of true ellipses being one of the impossibilities. It is not intended here to go into the analytical demonstration of the figure so found, but simply to attempt to show and describe a system by means of which we can construct with confidence and directness true elliptic curves by the compasses upon the given major and minor axes.

This, as will be seen, is quite unlike the ordinary way, in that the method here shown applies to almost every description of the figure, excepting very flat curves, whereas in the ordinary way the points for striking the curves have to be found by a kind of guesswork, and it is in this particular that the difference between the ordinary way and the system under consideration will be appreciated, as here the points are, in almost every case, fixed, and they determine the variety of curve. For instance, the two diameters are given; the construction of the diagram gives at once the exact positions of the points, and the exact lengths of radii that will describe the true curve which shall, if necessary, pass through any number of points previously found in the curve from the foci.

Of course, the ordinary method, for practical purposes in the shop or on the building, is to set out by a trammel. In some cases this is inconvenient; it certainly is so when working upon paper, and if we can make use of a method by which we can describe any or all of these curves truly by either compasses or radius rod, we at once very considerably lessen the labour and vastly increase the pleasure attached to the operation. In regard to the general way of describing the approximate figure by compasses, it may sometimes happen that the curve, when tested, will be somewhere near the truth, but such an approximation is rare and will not be the effect of a direct method but of accident, as the way in which it was brought about would not apply in the next case with the same result.

The mere inspection of the examples here given will be sufficient to show the value of the system, and to explain how to find the true section of a cylinder upon a given oblique cutting plane; to find the true section of a cone upon a given plane, the section of which is an ellipse; to find the angle rib, the true rib being given, of either brackets, coves, or groins by compasses or radius rod.

Some of the diagrams given show the curve tested by points found from the foci, and also by ordinates (see Figs. 8 and 9). In all the constructive lines are drawn, and they, it is hoped, show exactly the working out of the figure. It will be found that the extra point obtained for describing what may be termed the "haunch" of the ellipse is just where it is wanted, as in nearly every case by the old way there is an ugly break at the junction of the two curves or arcs.

Let it be required to find the section of a cylinder upon a given oblique cutting plane. Fig. 1 is the plan, and Fig. 2 the elevation of the cylinder. A *a* is the cutting plane. With radius A *a*, describe the arc *a b*, produce lines from *b* and A of any convenient length at right angles to the vertical axis of the cylinder, and erect a perpendicular at *d*. This line represents the line A *a*, erected and moved to *d*. Take any point in the line *b b*, and drop a perpendicular, E *e*; find the centre, *o*, and describe a circle to touch the lines A *a* and *b b* at the points E *e*. Take radius from plan, Fig. 1, and from *o*, Fig. 3, describe a circle to cut the diameter at the points *g g*. The lines E *e*—*z z* now represent the major axis, and the minor axis of the ellipse moved to *e*, and rotated. With radius of circle *o* E, from *g g* describe arcs cutting the perpendicular E *e*. From *o* describe a circle that shall touch both these arcs at the points *h h*. With set-square, angle 60deg., draw lines from *h h* to cut the perpendicular E *e*, and produce them. At the intersection of these lines with the perpendicular will be found the points whence to strike the portions of the curves at E and *e*. With set-square, angle 30deg., draw lines tangent to the small circle each way as before, and where they cut the lines of 60deg. previously drawn are the points whence to strike the corresponding portions of the figure. From the points *i i*, on the diameter, with radius *i z* and *z i*, describe the arcs *z z*, which will complete the section.

It is required to find the true section of a cone. Fig. 4 is the plan, and Fig. 5 is the elevation of the cone. A *a* is the cutting plane. Bisect A *a* in the point *b*, and through the latter draw C *c* parallel to the base of the cone. From A, with radius A *a*, describe the arc *a d*, and draw lines *d d*, A *a*. Erect the perpendicular E *e*, and from *o*, with radius *b a*, Fig. 5, describe a circle touching *d d* and A *a* at the points E *e* (Fig. 6). Through the centre *o* draw the diameter *g g*, and produce it both ways to cut the circle. To find the minor axis of the ellipse, lay out the line C *c*, Fig. 5, anywhere, as at Fig. 7, bisect it and describe a half circle upon it. Take the distance *c b*, Fig. 5, in the compasses and apply it to the line C *c*, Fig. 7, from *c* to *b*; upon the point *b* raise the perpendicular *b b*; then *b b* is the radius of the circle *o z*, the diameter of which equals the minor axis; the perpendicular E *e* the major axis. The completion of the section is carried out exactly as in the previous section of the cylinder, Fig. 3.

Given the elevation of a rib, to find the elevation of the angle rib that shall intersect at all points with the true rib. The intersecting angle equals 45deg., but may be any given angle. Let Figs. 8 and 10 be the true ribs, &c., Figs. 9 and 11 are the angle ribs, Figs. 8 and 9 show the curve tested by

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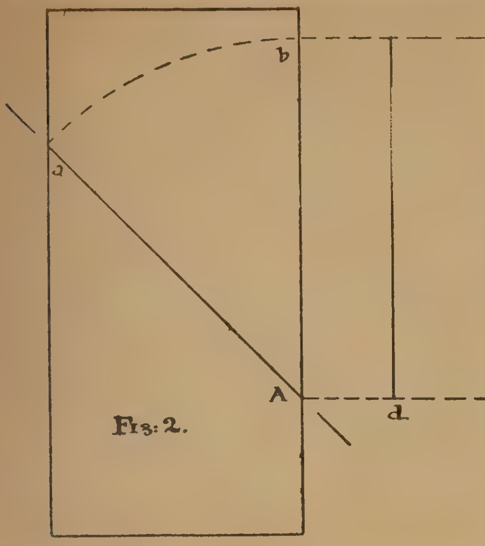

Fig: 2.

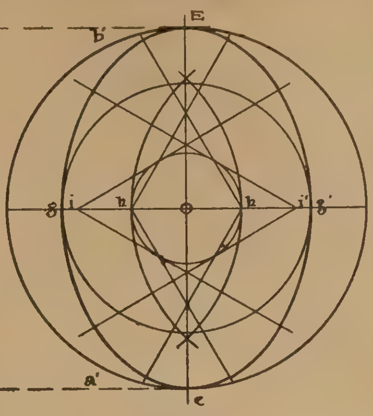

Fig: 3.

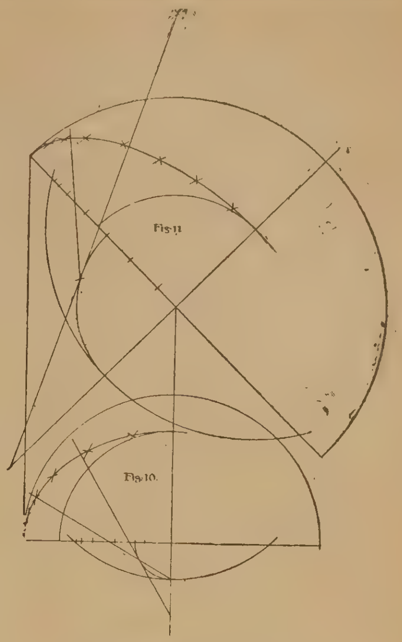
Fig. 11

Fig. 10.

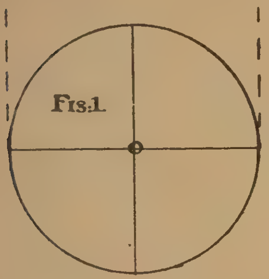
Fig: 1.

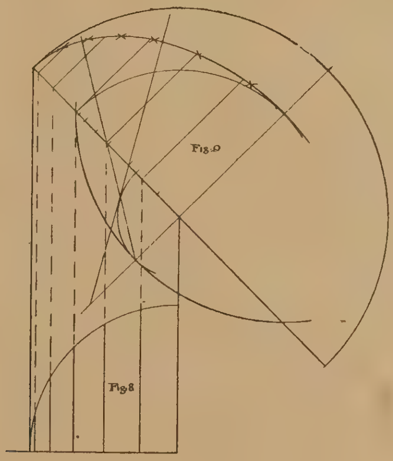
Fig. 9

Fig. 8

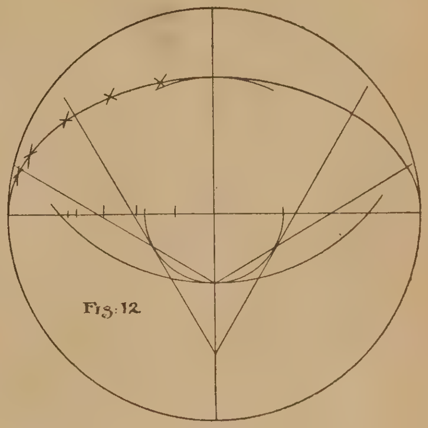
Fig: 12.

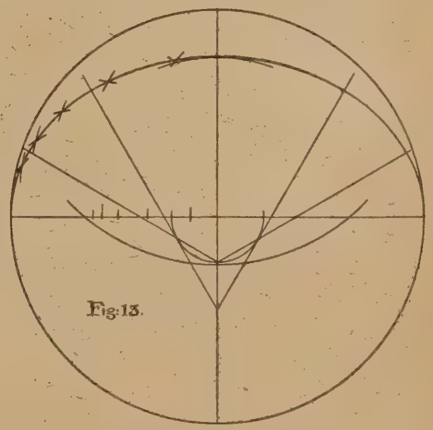
Fig: 13.

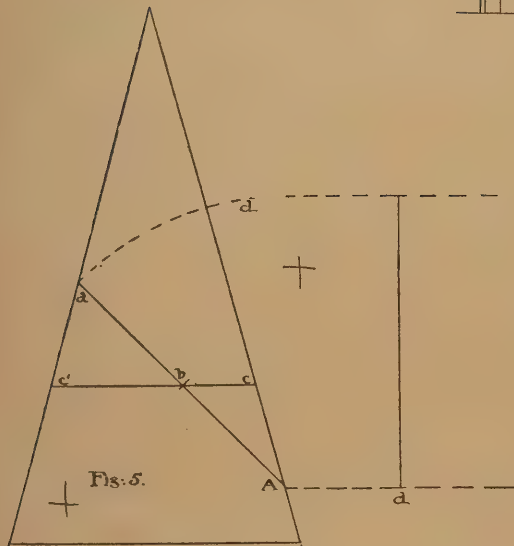

Fig: 5.

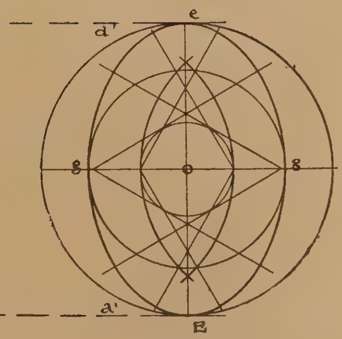

Fig: 6.

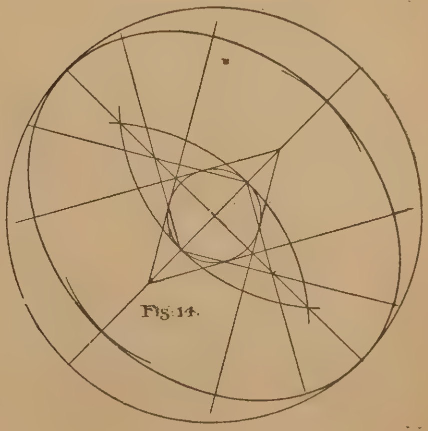
Fig: 14.

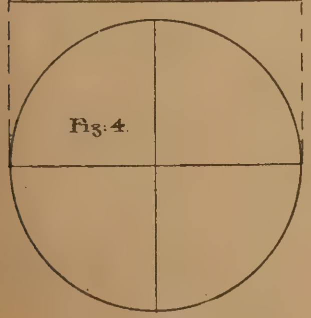
Fig: 4.

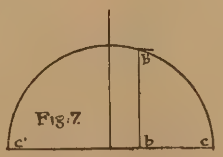

Fig: 7.

A NEW METHOD OF DRAWING ELLIPSES. BY R. RAMM.

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points, and also by ordinates. The description of the sections of cylinder and cone apply in the same way to these diagrams, and also to Figs. 12, 13, and 14. The angles of 30deg. and 60 deg. are as conveniently found by rod on the drawing-board as by set-square upon paper. We have only to apply the radius of the small determinating circle from *h h*, as centres, cutting the perpendicular and the circumference of the small circle.

Correspondence.

CIVIL SERVICE APPOINTMENTS.

To the Editor of The Builders' Journal.

London, W.C.

Sir,—Professor Henry Adams has so high a reputation for accuracy, that it is astounding to notice what a mass of faulty information he has contrived to give in his reply to "Anxious" in your issue for Nov. 22. The regulations which he quotes have been, in every single case, superseded for some considerable time! The only right thing to do would have been to refer the querist to the secretary of the Civil Service Commissioners, 68, Victoria Street, S.W., who will supply full, and correct, particulars gratis on application. But even these should be accepted with caution, as every examination syllabus is liable to alteration at any time without notice. "G. R." would also do well to examine the present syllabus before purchasing the books which Professor Adams recommends. Seddon's "Builders' Work," for instance, is now valueless, for the R. E. Surveyors' Exam., and whoever bases his studies on Leaning's "Quantities," does so at grave risk of failure—and this in spite of the excellence of the book; while the "Schedules" are the worst things possible for the purpose of pricing. "Specification" is worth all three books put together, and Stevenson's "Estimating" should be added.—Yours truly,

G. A. T. MIDDLETON.

To the Editor of The Builders' Journal.

London, E.C.

Sir,—Having, through your courtesy, seen the above letter, I would say that the particulars given were the most recent in my possession, and that they are not very materially modified by the later examinations, *e.g.*, although handwriting and spelling are not now taken as separate subjects it would be absurd to suppose they are not duly considered by the examiners. In the last examination for assistant civil engineers, H.M. Admiralty, mineralogy was omitted and sanitary engineering added. In the examination for assistant surveyor in the Works Department of H. M. Admiralty, mensuration, book-keeping, trigonometry, and algebra are omitted from the latest regulations. In the examination for assistant surveyor R.E. Civil Staff the two parts are taken as one, and surveying and levelling are added. In the examination for assistant surveyor, H.M. Office of Works, the two parts are combined, practical geometry and algebra are omitted, and the additions are history of architecture, valuation, and law subjects (arbitrations, fixtures, dilapidations, light, and air). The other subjects practically stand unaltered, although there are slight differences in the wording of the regulations.

I expressly recommended prospective candidates to apply to the Civil Service Commissioners for particulars as soon as any examination is announced, on account of the variation in details which may occur.

I can quite understand Mr. Middleton's objections to any of Col. Seddon's works, but that does not affect my opinion of their value. As to "Qnantities," Fletcher's book is perhaps likely to be more favoured by the examiner than Leaning's, but the latter is, in my opinion, far better and more in accordance with London practice. If a knowledge of quantity surveying derived from Leanings book could possibly lead to failure it would indicate something radically wrong in the examination. Respecting the "Schedules," I would only say that these are the priced items upon which the War Office work is actually carried out. By all means add "Specification" and Stevenson's "Estimating" to the List.

HENRY ADAMS.

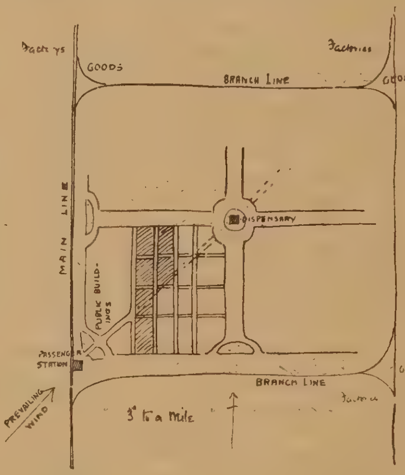
AN IDEAL CITY: MORE SUGGESTIONS FOR ITS PLANNING.

To the Editor of The Builders' Journal.

Bury.

Sir,—Having read with much interest the description of a model city and the very practical criticism on it by Mr. Strange, I should like to submit what to my mind are the essential points to be observed in laying out a town that shall give the maximum amount of convenience with the least objection.

In the first place, there is a great deal to be said in favour of what has been actually done in different localities to suit man's requirements, either in business or pleasure. It will generally be found on examination that certain dispositions of property or streets are the outcome of a natural want. Secondly, the heart of the modern town is the railway. It is our medium of communication with the rest of the world, and ready access to it is the chief consideration with the great majority. A few may prefer their home to be at a distance, but probably they are in a position to provide other means of easy conveyance—I mean in the way of horse or motor traction. A matter which is sometimes lost sight of is that the railway has two uses—passenger traffic and goods. Now the heart of it is the passenger part; the other should be as distinct as possible, consistent with easy access, and should be near the working or factory part, and, therefore, away from the residential district.



SUGGESTED PLAN FOR "GARDEN CITY."

Starting then with the passenger depôt as our nucleus, we begin by grouping round it the more palatial buildings. These would consist of municipal buildings, public assembly rooms, with probably the parish church, hotels, and residential mansions, and should be easily accessible by wide avenues and open spaces, giving proper dignity and distance from which to view them, whilst immediately at the back would be found the larger retail stores. Although the model dwellings for the poorer, or artizan, class, as well as factories and similar buildings, would be the best of their kind and no slums would be allowed to germinate, yet I think we should find that architectural efforts most pleasing to the eye would still be devoted to the edifices just mentioned.

Imagine the stranger on his first visit standing on the threshold of the strange city. What he then beholds will influence his opinion, and will create a prejudice that may be very hard to shake off. I know that on my first visit to Liverpool, viâ Lime Street, I was delighted with the noble group of buildings which I saw, and again at Manchester. Well, Manchester is Market Street and Albert Square. I think that in this way London is greatly handicapped, with all its wealth of buildings. There is not a great central feature to catch the eye and create a great primary impression which will never be forgotten.

Radiating, then, from the station should be wide avenues of as easy a gradient as possible, and, preferably, in three widths, the centre being devoted to that most essential equipment, the electric tramway. At the back of our town should be placed the working part, making it as far as possible to consist of factories, mills, or workshops only. Care should be taken that the winds prevailing should blow on to this district, and also that it should be on the highest part, and not on the lowest. At the back, again, of this should be a branch railway for goods.

I send herewith a sketch which will illustrate my meaning. It will be seen that I have placed the railway passenger station at the S.W. corner on a main line running N. and S. Extensions W. or S. to be residential only. Running from this point are main arteries with a bold crescent or square, having a park or enclosure in the centre. The streets, again, should be formed to run N. and S. It does not follow that the town would be long and narrow on this account, as the gabled streets could be of any length, but would be subordinate, and could give access to back streets, thus keeping the fronts clear of a lot of dirt and refuse.

The factories should be placed at either of the other three corners, and connected to the main railway by loop or branch lines. One advantage of the arrangement given would be the value of the land for its purpose, and as the outlying portion would be cheaper it would suit capitalists wishing to erect works covering a large area.

Although we cannot arrange awnings to cover the entire street in time of wet weather, as suggested in "Looking Backwards," we could go half way and build shelters, leaving spaces for these and enclosures at intervals. A good position for a hospital or dispensary might also be in one of these spaces. We certainly ought to arrange for pneumatic tubes to convey our goods, as well as a culvert to take sewer, gas, and water pipes and electric lighting and telephone mains, &c. I do not think it would be out of the range of possibility to have all smoke flues conveyed to one central main leading to the outskirts.

Mr. Strange is severe on absurd by-laws, and although too great rigidity is to be decried, yet he must surely admit that much good has been done by the adoption of the model ones, if not in their entirety, at least in some of their more salient points. It is the aim of the authorities to control the speculator, who naturally wants to build cheaply, but, alas, not always securely, and the responsible architect is not primarily the object of their application. The fault may be the manner in which by-laws are commonly administered. The surveyor to the urban authority is not an architect, but an engineer, and he does not look at the question from its artistic aspect. His deputy is, perhaps, a bricklayer or joiner by trade, and between them they hamper and oppress with the means at hand the inspired architect in his flights of genius. Possibly with a little bending on both sides the intentions of the Local Government Board would be found to be for the good of the community at large, and therefore to be considered in our ideal city.

Although I have shown a crescent on plan, I might add that these should be used sparingly, and of as large a curve as possible. The Lewes Crescent, at Brighton, is a fine example of what a crescent should be—it is about 700ft. across, but it would be still better if it were 1,000.—Yours faithfully,

B. S.

Dewey Memorial in New York.—The necessary money for the erection of the Dewey memorial arch in permanent form has been pledged, and work on the new structure will begin at once. The total cost will probably amount to about a million dollars. It has not been positively decided yet whether the permanent arch will be erected on the site of the temporary one at Madison Square, or at the Lennox Avenue entrance to Central Park, or elsewhere.

THE PERFORMANCE OF CONTRACTS.*

TO the bewildered student of our chaotic jurisprudence, engaged in "mastering the lawless science of our law—that codeless myriad of precedent—that wilderness of single instances"—Mr. Rawlins' work on "The Specific Performance of Contracts," will come as a boon. Treatises, such as this, are all too rare in our legal literature. Now and then a specimen appears—"Hawkins's Concise Treatise on the Construction of Wills," published in 1863, was one; but it can hardly be said to have had a successor until the book now under review. "A concise text-book which aims at discharging the modest function of a finger-post," to use the language of Mr. Rawlins in his preface, requires for its compilation qualifications that many authors do not possess. The truth is, it is often much easier to write a voluminous dissertation on a legal subject than an essay which, while absolutely trustworthy, is condensed within the narrowest possible compass. To frame definitions which shall be strictly accurate, to enunciate principles in language which is at once brief, unambiguous, and correct, and to make a judicious selection among a multitude of decided cases, needs great learning, wide research, and untiring industry; Mr. Rawlins has accomplished this difficult task with conspicuous success. His epitome will prove an excellent introduction to a work already become classic—that of Sir Edward Fry, to whom it is dedicated, and who, with his usual kindness, has afforded Mr. Rawlins his invaluable assistance in its preparation.

The specific performance of contracts is a subject not devoid of interest for even the non-professional reader. Almost everyone may have occasion at some time or another to enter into a contract, the non-performance of which by the other party will cause disappointment, inconvenience, and loss, for which mere money will afford no adequate compensation. For such wrongs the Common Law of England gave no satisfactory redress. Pecuniary damages constituted practically the only kind of atonement which it provided. A broken head, a broken heart, or a broken covenant alike gave rise to an action which, to use a legal phrase, "sounded in damages." In this respect the law of Scotland was in advance of our own, as it gave, in certain cases, a remedy called "implement," which is, in fact, specific performance under another name. The beneficial action of courts of equity in supplying defects in the Common Law is, perhaps, nowhere better exemplified than in the assumption and exercise of the jurisdiction to compel people to actually carry out the agreements into which they have entered, and to prevent their escaping by merely paying pecuniary damages. These courts were courts of conscience, originally presided over by ecclesiastics, and acted upon broad principles of natural justice. A similar system grew up in Rome, where successive Prætors, by their annual "edicts," gradually established an enlightened code of equity. It is curious to note, however, that the idea of compelling the specific performance of contracts found no place in Roman equity. The Continental systems of jurisprudence have been largely founded on Roman law, and the result has been that, except in Scotland, it is only in places which have derived their ideas from English law—Ireland, certain of our Colonies, and the United States—that this remedy exists. The ecclesiastics who sat as judges seem to have derived their ideas on this subject from the Canon Law, which apparently recognised the principle. Chaucer, in "The Friar's Tale," speaks of—

> An Erchdeken, a man of gret degré,
> That boldely did execucioun
> In punischyng of fornicacioun,
> Of wicchecraft, and eek of bauderye,
> Of diffimcionn, and avoutrie
> Of Chirche-reeve and of testamentes,
> Of contractes, and of lak of sacraments,
> And eek of many another maner cryme.

The jurisdiction, whatever be its origin, can be traced back as far as the reign of Richard II., but the Common Law Courts vigorously opposed its exercise, and so late as the tenth year of James I. the judges of the King's Bench, with the illustrious Lord Coke at their head, stopped by prohibition, in the case of *Bromage* v. *Gennings*, what seems to have been a suit in the Marches of Wales, to enforce specific performance of a covenant to grant a lease. So strong, indeed, was the feeling of Common Law lawyers on the matter, that Serjeant Harris, the respondent's counsel, said that the part he took in the case was against his conscience. Let us hope that he returned his fee!

It is not all contracts, however, of which a Court of Equity will compel the specific performance. At first, this seemed to depend on the discretion of the Chancellor. Mr. Rawlins quotes a well-known passage from Selden's "Table Talk," which shows what was the impression that prevailed in the seventeenth century regarding the fluctuating views of different holders of the seals. We make no apology for reproducing it:—"Equity in law is the same as the spirit in religion, what everyone pleases to make it. Sometimes they go according to conscience, sometimes according to law, sometimes according to the rule of the court. Equity is a roguish thing; for law we have a measure, know what to trust to; Equity is according to the conscience of him that is Chancellor, and as that is larger or narrower, so is Equity. 'Tis all one as if they should make the standard for the measure we call a foot, a Chancellor's foot; what an uncertain measure would this be! This Chancellor has a long foot, another a short foot, a third an indifferent foot. 'Tis the same thing in the Chancellor's conscience."

However well founded these ideas may once have been, they have long since ceased to be even approximately true. Lord Eldon, under whose chancellorship many equitable doctrines attained shape and fixity, denounced them in emphatic language. "Nothing," said he in *Gee* v. *Pritchard*, "would inflict on me greater pain than the recollection that I had done anything to justify the reproach that the equity of this court varies like the Chancellor's foot."

But the long feud between courts of equity and courts of law was finally composed by the Judicature Act, and at the present day equity "walks arm in arm with precedent." The rules of equity are happily now, so to speak, stereotyped; the difficulty lies not so much in stating as in applying them. As regards the enforcement of contracts by a judgment for specific performance, the cases in which that remedy is available are clearly defined. Thus, you cannot compel the specific performance of a contract for the sale of an article of ordinary commerce, such as wheat or wool, but you can do so in the case of a contract for the sale of a house or an estate. The reason is not far to seek. In the former case you can go into the market yourself, and buy the same quantity of the article, and if you have to pay more for it, recover the difference, and, in some instances, other consequential loss, as damages. Pecuniary damages therefore afford sufficient redress. But not so in the latter case. You cannot, or at any rate, may not, find a house or an estate exactly similar to that which you bargained for, and pecuniary damages, therefore, would not place you in the same position as you would have occupied if the sale had been actually carried out. This is the reason why you cannot obtain special performance of a contract for the sale of Government stock, or any other security which is commonly sold in the open market, but can compel the delivery of those securities which, like the shares of many joint stock companies, are not always to be had at a price.

Mr. Rawlins gives an exhaustive list of the cases in which specific performance will be refused. The most important class of these is, perhaps, that in which the contract is in its nature strictly personal, as where it relates to personal services to be rendered by one of the contracting parties. You cannot obtain the specific performance of a contract to serve as an assistant in business, or to enter into partnership, any more than of a contract to marry. Closely connected with this class of cases is another in which the readers of the Builders' Journal are more immediately interested—namely, those for the erection of houses, the working of mines, the construction of railways, and others involving a continuous series of acts. Specific performance of such contracts cannot be enforced, the reason being that the court would be unable to superintend or enforce effectually the execution of its judgment. There is another case in which, curiously enough, specific performance cannot be obtained—namely, where the contract is for the loan of money. In that case, neither party can enforce it in this way, except that if it be already advanced, the borrower can be made to execute the mortgage or other security agreed on.

For the grounds of defence to an action for specific performance we must refer our readers to the work itself, mentioning only one—namely, misrepresentation made by the party seeking to enforce the contract, in order to induce the other party to enter into it. On this point Mr. Rawlins quotes a passage from a judgment of Mr. Justice North, which embodies the law on the subject: "It is quite true that a man may with impunity tell a lie in gross in the course of negotiations for a contract; but he cannot, in my opinion, tell a lie appurtenant. That is to say, if he tells a lie relating to any part of the contract or its subject matter, which induces another person to contract to deal with his property in a way in which he would not do if he knew the truth, the man who tells the lie cannot enforce the contract." Arthur Houston, Q.C.

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* "The Specific Performance of Contracts." By W. D. Rawlins, Q.C. London: Sweet and Maxwell. Edinburgh: Green and Sons. Price, 5s.

Views and Reviews.

THE PROCESS YEAR BOOK.

The subject matter of this annual is apparent from the title, but the scope of the work is more particularly a review of the graphic arts. We may deplore the non-decorative get-up of modern books and periodicals, but as this in the majority of cases is influenced by commercialism, we feel that the system has come to stay. The introduction of thin types in place of the old black-letter ones at once threw the wood-cuts out of relation; then these latter became photographic in nature, marking a still further degradation of decorative aspect in books; and finally we have the photo-mechanical processes, which have now practically banished the wood-cut. William Morris and his followers have done considerable good in reminding us that modern printed works are not decorative and in showing us by what means they can be made so, but the illustrative artist cannot do without some slight knowledge of the processes now in use for illustration. We know of no better work to provide the knowledge than this annual. The book contains a very large number of illustrations in all the usual processes of reproduction, and contains an immense amount of information, but this is conveyed in articles written by experts who have a rather exaggerated view of their particular subject, and reminding one of the cobbler's remark: "There is nothing like leather." It would be well in future numbers, we think, if the Editor gave more hints upon the true value of the various processes of reproduction. Photography in colour and reproduction by the half-tone colour process occupies rather too prominent a place in the book for the general reader, for we consider it will have to make large strides before it can be extensively adopted in place of colour collotypy, photogravure or lithography. The annual is most carefully printed on glossy paper, and shows modern work at its best.

"Penrose's Pictorial Annual: The Process Year Book for 1899." Penrose and Co., 8 and 8A, Upper Baker-street, Lloyd-square, W.C.

DISCHARGES AND VELOCITIES OF SEWERS.

This small book contains a series of diagrams designed from calculations based on Weisbach's well-known formula, and dealing with discharges up to 300 cubic feet per second, equivalent to over 161,600,000 gallons in twenty-four hours, together with velocities up to 15ft. per second. The diagrams are intended to facilitate the determination of information on various matters connected with the flow of liquids in sewers and conduits, and to some extent meet the need which engineers engaged in designing sewerage schemes now experience, for an expeditious method of obtaining the discharges and velocities of sewers and water conduits of various sizes, laid at different gradients, and when sewage is flowing in them at various depths. The information has been put in diagrammatic, in preference to tabular, form, first on account of the smaller liability in the former case to serious mistakes by reason of clerical and other similar errors, which, if of moment, generally make their presence conspicuous on a diagram; and, secondly, because, on account of their greater compactness and completeness, the diagrams forming a series may be read in conjunction with one another with greater facility than tables. Mr. Newton has succeeded in producing a very valuable work in thus lightening the labour and time expended on one department of engineering.

"Diagrams exhibiting the Discharges and Velocities of Circular and Oval Sewers, and Water Conduits, together with Notes on the design of Sewerage Schemes." By Edwin B. Newton, F.S.I., A.M.I.C.E. London: St. Bride's Press, Ltd. Price 2s. 6d. nett.

ELECTRIC WIRING.

Although there is no lack of popular guides to electric lighting, mostly published at 1s., and full of cuts taken from manufacturer's catalogues, on the one hand, and of abstruse and highly mathematical "elementary" treatises on the theory of electricity on the other hand, yet there are very few books that deal in a practical manner with the appliances needed in electric lighting. The book under notice attempts partially to fill the gap, and in a measure succeeds. Students, especially those preparing for the Preliminary and Ordinary Grade examinations in electric lighting conducted by the City and Guilds of London Institute, may be recommended with confidence to the book, while to a more limited extent architects and builders will find it useful. The three chapters into which the work is divided deal principally with lamps, both glow and arc, switches, and systems of wiring. As a commencement the book gives a short account of the manufacture of incandescent or glow lamps, including notes on the preparation of cotton for filaments, the carbonisation of the cellulose wire, mounting the filaments, flashing, sealing, exhausting the lamp bulbs, and testing. Necessarily not much more than an outline of each of the processes is given, but it is to be regretted that no reference was made for the benefit of the student to a work giving fuller information, such, for instance, as Ram's "Incandescent Lamp." This, indeed, is one of the shortcomings of the book, the reader being shunted—to use an appropriate term—to the author's other elementary manuals, rather than to a handbook written by a specialist, for further information on matters that cannot be completely considered in the book under discussion.

After the account of the manufacture of incandescent lamps, descriptions are given of several forms of lamp-holders and switch lamp-holders, the reader in this way becoming initiated into the mysteries of B.C. (bottom contact), etc., E.S. (Edison screw), and other initial letters to which the electrical engineer is so extremely partial. Forms of glow lamps, their shades, &c., are illustrated and mentioned, and a short discussion on the efficiencies of the lamps and the method of connecting them to the mains completes this section. It is interesting to note, simply by the way, the failure of the attempt to use "incandescence" as the adjective rather than "incandescent"; nowhere in the book, as far as we have seen, is the first employed.

In connection with the power efficiency of glow lamps, we are glad to note that the author allows ordinary lamps about 3·75 watts per candle, many writers on the subject unjustifiably assuming higher efficiencies as average values. The remainder of the first chapter describes the action of ten different types of arc lamps and their accessories, and, miracle among such works, the book describes only one form that is obsolete. This portion of the book is perhaps the most valuable, useful line drawings being given of most of the lamps, so that the mechanism can be clearly understood. Four of the modern enclosed arc lamps are treated, including the Jandus, Stewart, Davy, and Lewis lamps. The second chapter contains descriptions of many forms of switches, fuses, wall sockets, earthing devices, lightning arresters, &c. The information given is in many cases little more than a description of a trade block, and not much that is quantitative appears, nothing, for instance, being said as to areas of rubbing surfaces in switches, carrying capacities of different metals, distance between parts at opposite poles, &c. This robs the book of value it might have possessed for the electrical designer. The third chapter can be commended to the notice of architects, as, in addition to other matter, it contains good descriptions of the following systems of wiring: Bathurst's armoured insulating tube system; Waterhouse's and other plain tube systems; the National Electric Wiring Co.'s lead-sheathed system; Andrews', and Mavor and Coulson's concentric systems; and, finally, the wood-casing system, if so it can be called. Some practical directions on jointing wires, a few simple notes on electrical and other units, &c., and a reprint of the wiring rules of the Institution of Electrical Engineers complete the book. The illustrations number 360, but a very large proportion have already been used in catalogues, and are therefore only more or less appropriate; those that have been specially drawn are, however, specially helpful. The book is descriptive rather than critical and is written in a plain style, the accounts and explanations being simple, and, in some cases, even artless.

"Electric Wiring, Fittings, Switches, and Lamps." By W. Perren Maycock. Price, 6s. London: Whittaker and Co.

MODEL BY-LAWS.

To all concerned in questions of building and sanitation throughout the country, the subject of the present work is of extreme importance. Messrs. Mackenzie and Handford have attempted a laborious task; and the two substantial volumes before us bear witness that they have accomplished it in a creditable manner. The work is necessarily on similar lines to the well-known "Annotated Model By-Laws" of Messrs. Knight and Co.; but it contains additional matter, much of which is original, and it seems to have been brought thoroughly up-to-date. The model by-laws and regulations of the Local Government Board are interspersed throughout with explanatory comments, in which collated reports of legal decisions bearing upon the various questions discussed are embodied, being conveniently arranged for ready reference. Not content with this, the editors have suggested alternative forms of by-laws, adapted to the varying conditions of different localities, and numerous regulations relating to building, sanitary, and other matters that come within the general scope of the Public Health Acts and kindred Acts of Parliament. Several matters of detail are illustrated with the aid of appropriate diagrams, which, we should imagine, will prove to be of practical utility to those for whom the work seems principally intended—that is, to local bodies engaged in drawing up their own by-laws and regulations. As a work of reference, also, it will be found almost indispensable to surveyors acting under municipal or local authorities, and one which architects and builders may frequently consult with advantage. It bears evidence of considerable knowledge and experience and a general acquaintance with the practical needs of various localities; and the editors acknowledge the assistance which they have received in the form of suggestions from Messrs. R. Bruce Low, M.D., and C. Shaw Bond, M.B., M.R.C.S., D.P.H., on sanitary questions, and from Mr. Brook Taylor Kitchin, on questions relating to architecture.

Among so much that is excellent, it is not surprising that there should be found here and there a statement to which exception may be taken, or an instance where fuller information might have been imparted. Thus, for example, it is certainly an error to suppose, as stated at page 88 in the first volume, that it was held in *Drury* v. *Army and Navy Auxiliary Co-operative Supply Company, Limited*, that a wall was only a party wall in so far as it divided "one building from another." On the next page, "*Western*" v. *Arnold* is obviously a misprint for "*Weston*." At page 110 the usual proportions in the composition of lime mortar and cement mortar are specified, but at page 117 no suggestion is offered upon the composition of concrete, which is a matter about which mistakes are more likely to occur. At page 110 reference is made to the practice, sometimes advocated, of grouting walls at every course. "There are serious practical objections," it is remarked, "to this requirement, which, moreover, would be very difficult to enforce. At best the 'grout' only effects what should be, and, with very little additional trouble, may be done with 'mortar.'" There lies the point. If we could always depend upon the ideal bricklayer being employed, we could be certain that the "very little additional trouble" would be taken; but as this, alas, is not the case, it may be as well to require brickwork to be grouted, especially as the most serious objections to it have been obviated since the practice of building-in wood bricks and bond timbers was abandoned. The suggestion made at page 117 that basements should be kept dry by means of hollow walls will commend itself to most persons. Many, however, would prefer to have the greater thickness of wall on the inside instead of on the outside, as shown in Plate III., Fig. 9. By the former arrangement the main portion of the wall is kept dry, and adequate support is provided where it is wanted for the floor timbers above.

The suggestion made at page 179 for providing an outlet to the external air, in addition to a window, for the ventilation of an indoor w.c., is to be commended, but we fear that it would be of little efficacy unless some special means of extraction were provided. Too often the admission of cold air has the effect of driving the foul air of a closet into the house. Where possible, it is better to provide a well-ventilated lobby between the closet and the rest of the house.

In the second volume thirteen original supplementary series of by-laws and regulations are given, most of which seem useful and desirable. In some of them the scantlings for timbers of roofs and floors are prescribed. It must surely be through an oversight that, at page 19, the beams and girders in ordinary floors are directed to be laid 10ft. apart, seeing that provision is made for floor joists for bearings up to 23ft. The scantlings prescribed do not err on the side of extravagance, and we would suggest that in some instances more latitude should be allowed. Why, for example, should not a builder have the option of using 9in. by 2in. instead of 7in. by 3in. for a bearing of 15ft.? The objection to thick floor joists is that their shrinkage is often sufficiently appreciable to cause cracks in the ceiling under them. Such little points as those to which we have drawn attention might perhaps be revised in a future edition, to which it seems likely the work under notice may attain.

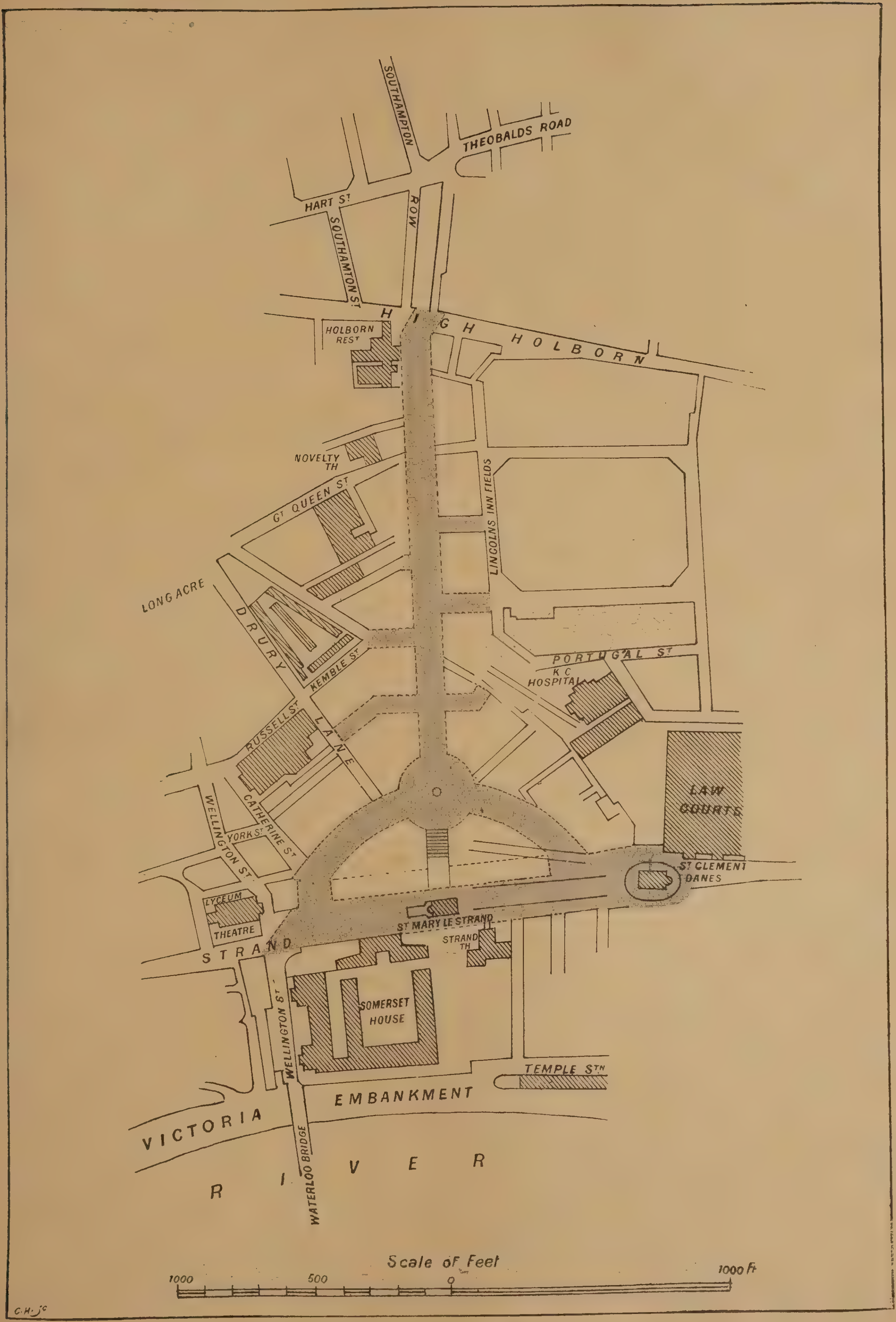
G. H. B.

"Model By-Laws, Rules, and Regulations, under the Public Health and Other Acts, with Alternative and Additional Clauses." Prepared and Edited by William Mackenzie, M.A., and Percy Handford. Two vols. London: Shaw and Sons. Butterworth and Co.

Back Numbers of the "Builders' Journal."—The publisher will be glad to receive from readers, any copies which they may be able to spare of the following numbers of the BUILDERS' JOURNAL:—Nos. 1, 3, 5, 6, 27, and 35. In exchange, he will be pleased to send a copy of the current number of THE ARCHITECTURAL REVIEW.

Supplement to the **Builders' Journal and Architectural Record,** *December 6th, 1899.*

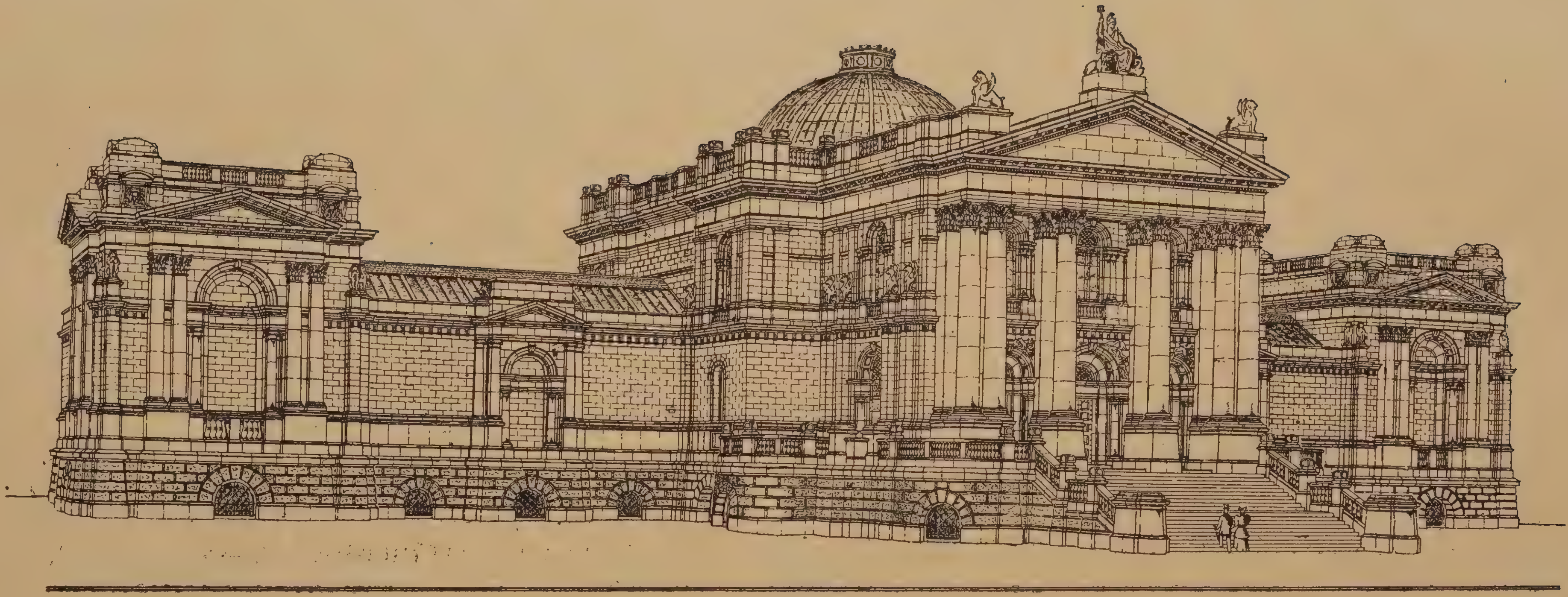
FROM HOLBORN TO THE STRAND: AN IDEAL STREET.



PLAN OF NEW STREET WITH SUGGESTED IMPROVEMENTS: BY MERVYN MACARTNEY.

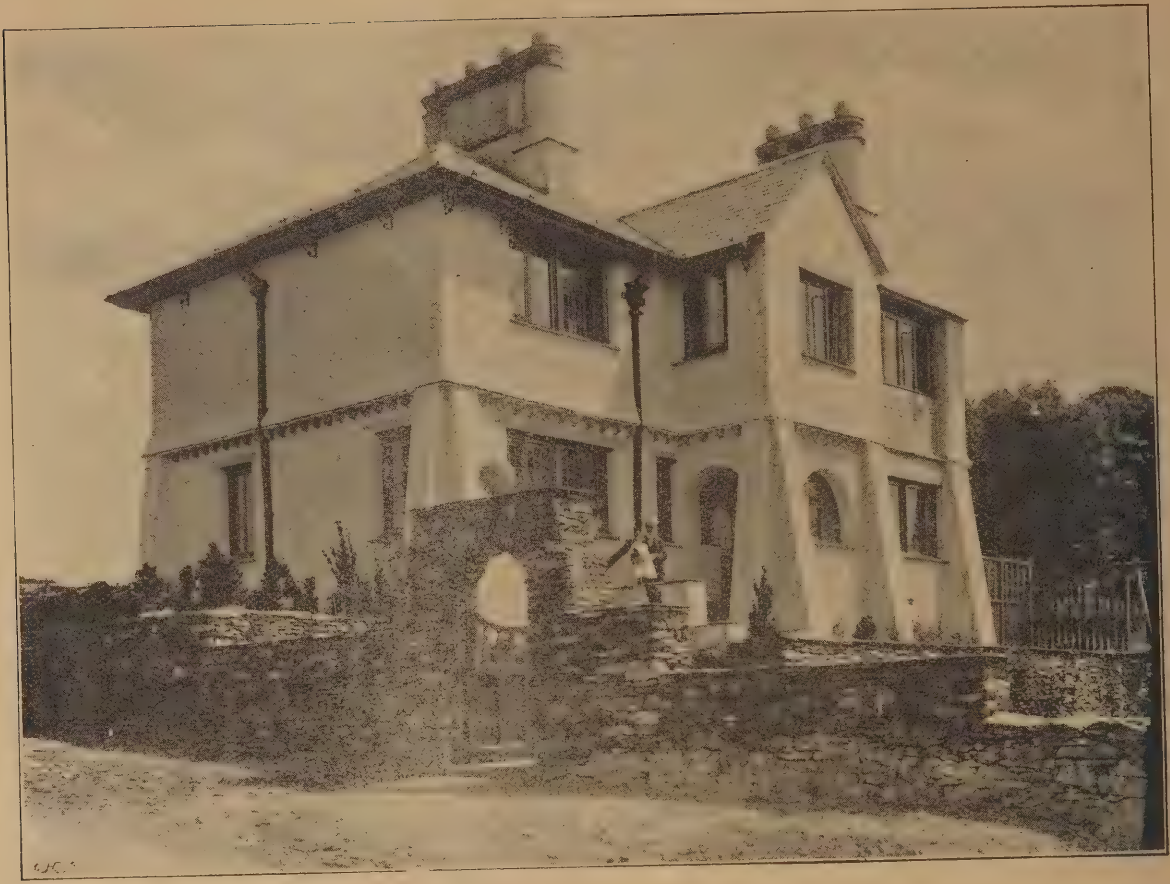
(The above is from the article in the December number of The Architectural Review.*)*

SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, WEDNESDAY, DECEMBER 6, 1899

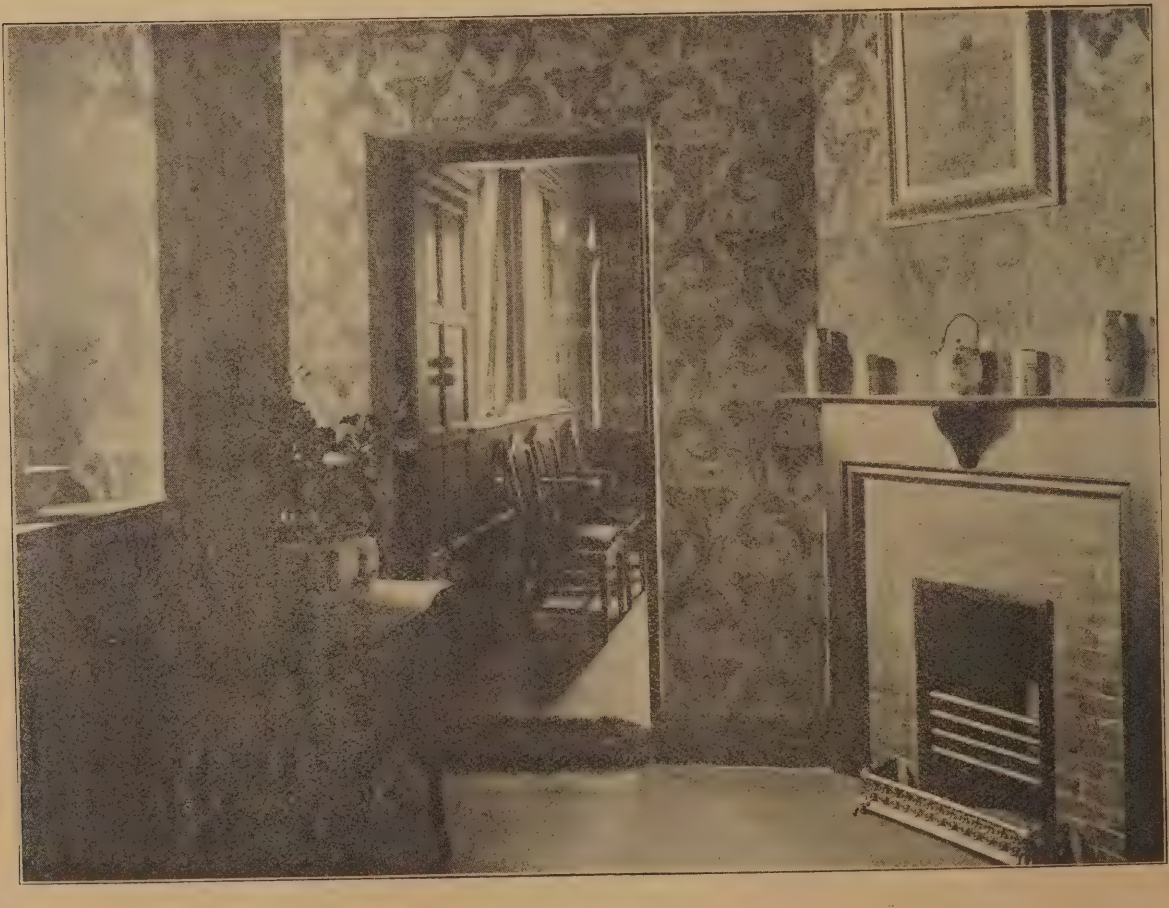


THE NATIONAL GALLERY OF BRITISH ART AS COMPLETED. SIDNEY R. J. SMITH, F.R.I.B.A., ARCHITECT.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

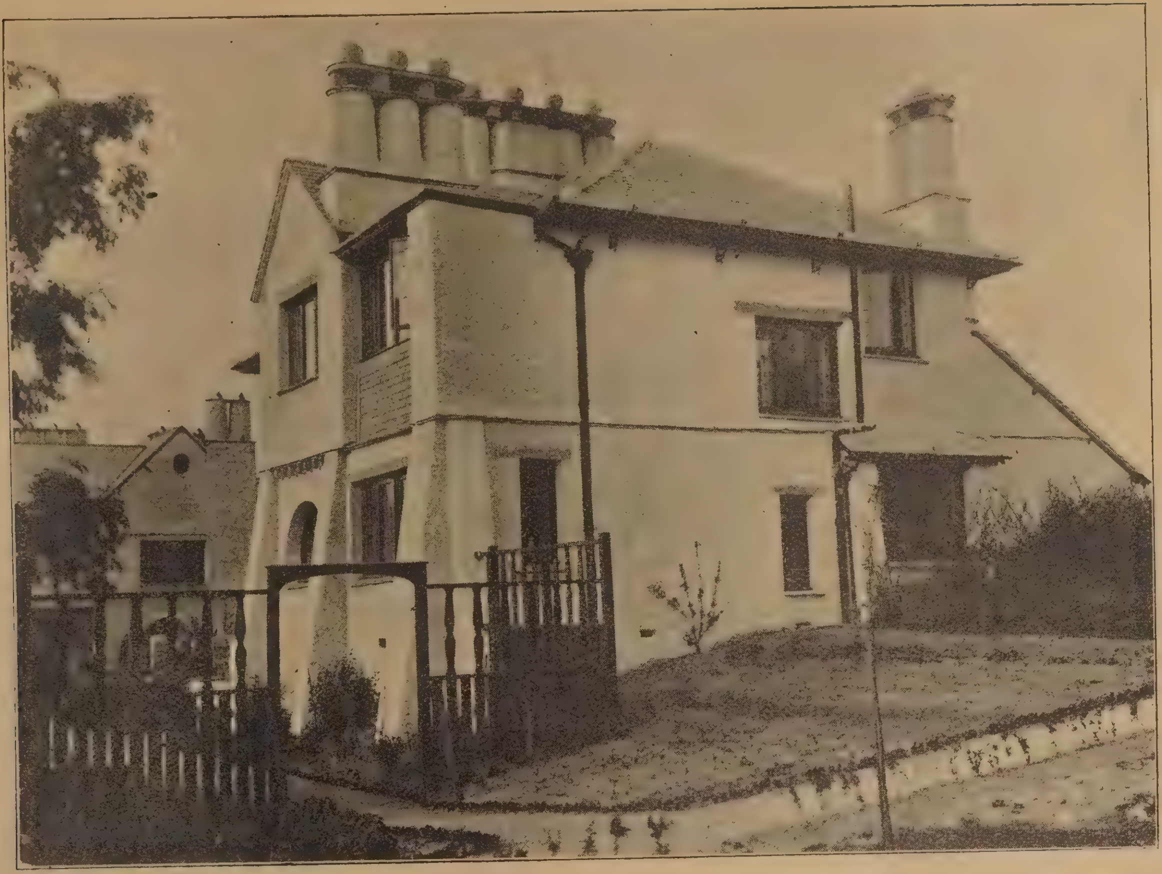


"THE CORBELS."

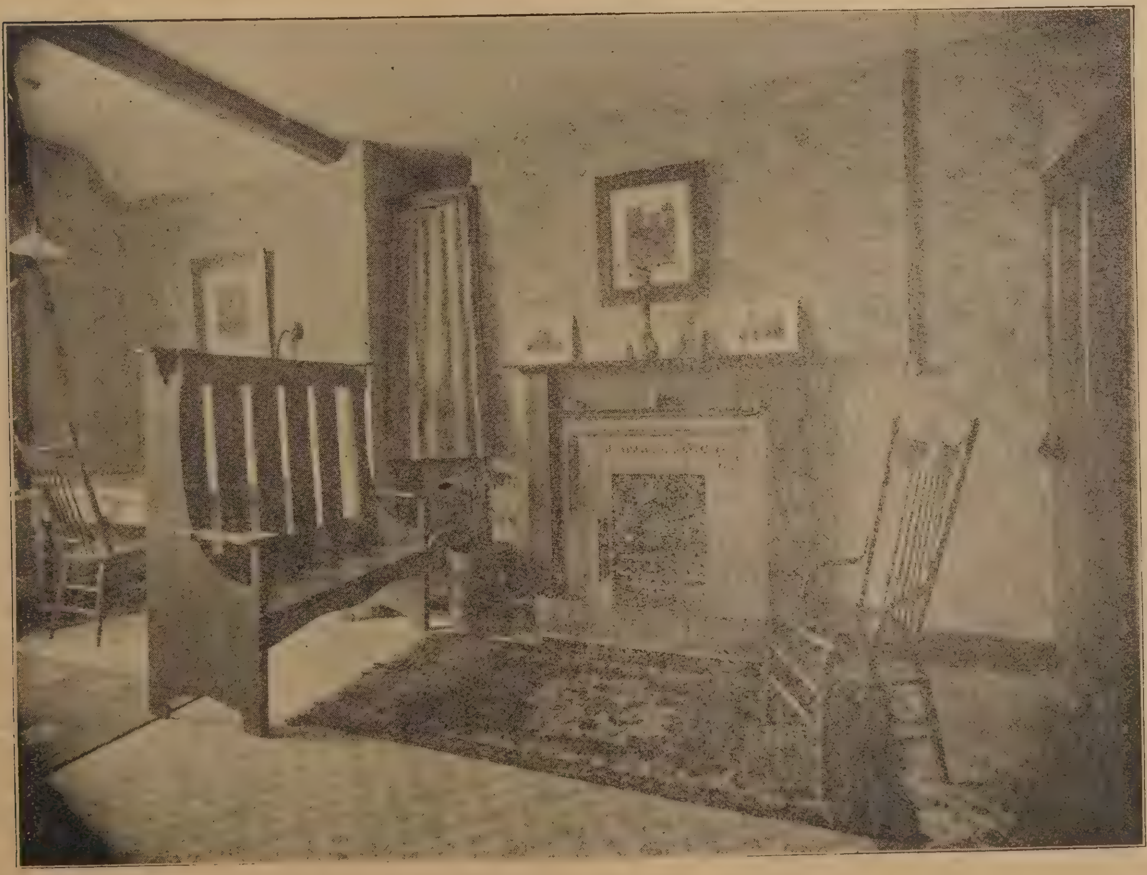


AN INTERIOR, "THE CORBELS."

RESIDENCE AND OFFICE OF MR. T. H. MAW



"THE CORBELS.



INTERIOR OF OFFICE.

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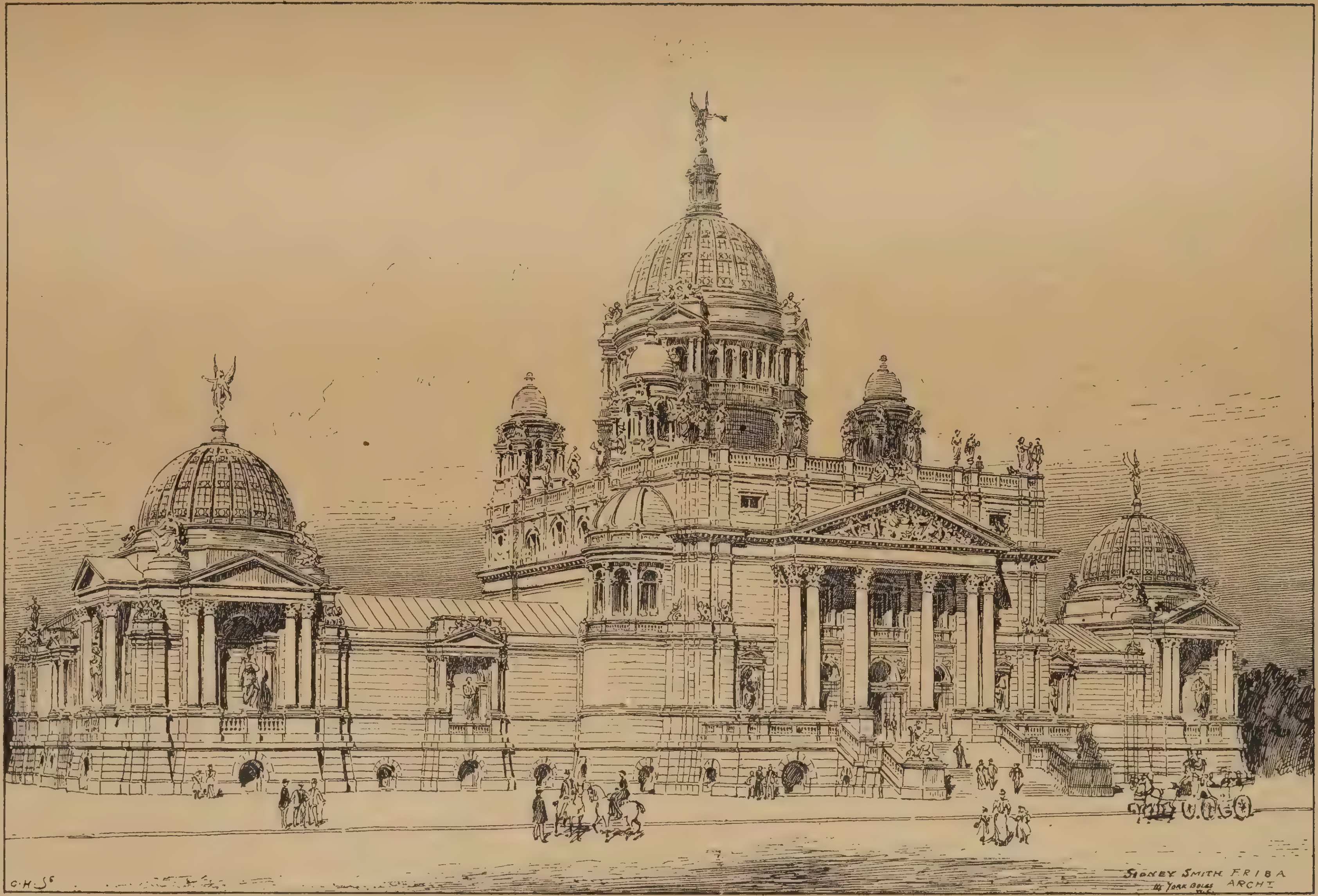
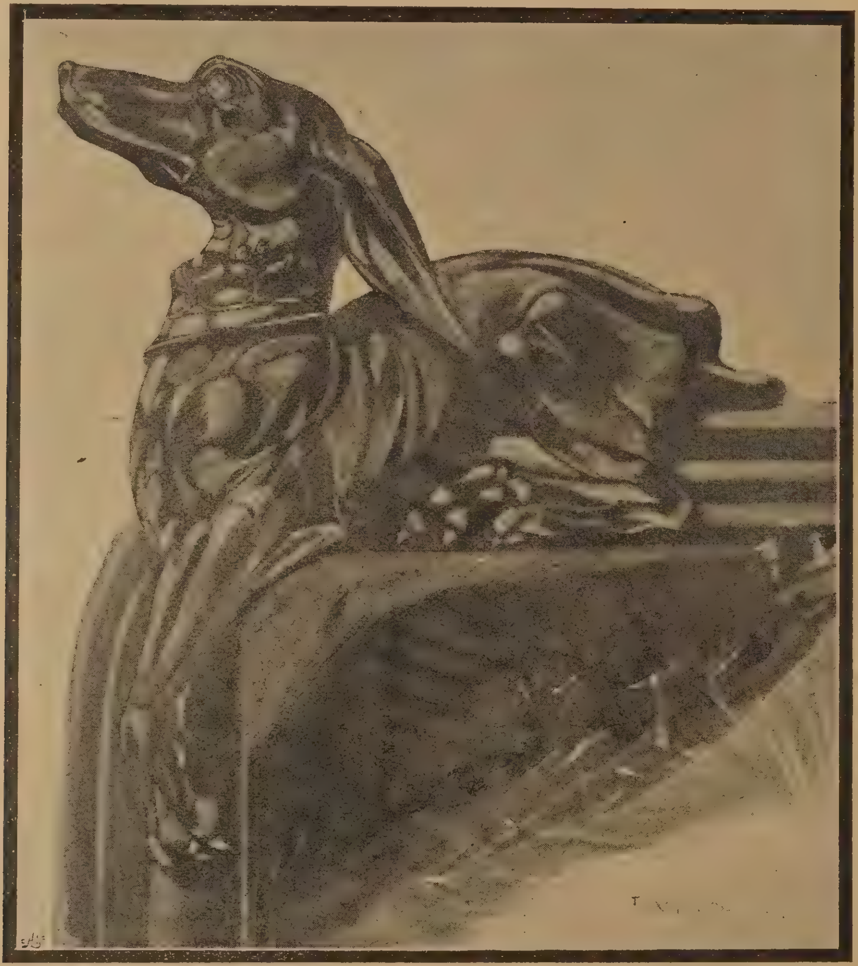


FIRST DESIGN FOR THE NATIONAL GALLERY OF BRITISH ART. Sidney R. J. Smith, F.R.I.B.A., Architect.

THE HOUSES OF PARLIAMENT: BY PAUL WATERHOUSE: WITH ILLUSTRATIONS OF PUGIN'S WORK BY PATTEN WILSON.

* * * *

An architect should be an *ἀρχιτέκτων*, a master workman, not a *παντέκτων*, which—if there be such a word—means a jack-of-all-trades. Here we have dangerous ground of course, and a theory which, however sound in itself, will serve to bolster up the iniquity of the man who cannot draw a stroke, but who can sweat half-a-dozen clever draughtsmen. The impropriety of this misapplication of the theory does not upset its truth, and the Houses of Parliament remain an example of what can be done in real art by a co-operation of workers under an able and modest head. I am quite aware of the controversy as to the authorship of the building which broke out after the death of the two great men concerned. That controversy was wholly unnecessary, but has mercifully detracted little from the dignified renown of the dead heroes, on whose supposed behalf the war was waged. Neither Sir Charles Barry nor Augustus Welby Pugin would, I think, have wished to see the other's claim obliterated or even challenged. The laborious and modest Pugin cared little for personal renown so long as good work was done and he had a hand in the doing of it; and Barry, while he lived, paid more than one tribute to the able assistance of his coadjutor.



CARVED FIGURE ON SEAT END ON RIGHT OF DOOR: BY P. WILSON.

The above is extracted from an article, Part I. of which appears in the Architectural Review for December. This number is one of the best that has been yet produced, and is one of the most attractive of the Art Annuals that appear at this season. There are many other articles of interest to the Architectural Profession. "From Holborn to the Strand: An Ideal Street" is the title of a suggestive article by Mervyn Macartney, and illustrated by plans of the proposed London improvement. "Nôtre Dame la Grande, Poitiers," is an article written and fully illustrated by T. M. Rooke, which is a guarantee of its attractiveness. There are several other equally instructive articles. Being an Art Annual there are several special plates in this number. There is a coloured supplement entitled "A Spanish Garden," from the original painting by A. T. Griffith, and there are full-page plates: "Bridgnorth," from a lithograph by Oliver Hall; "Jerusalem from the Hill of Evil Counsel," from the original painting by T. R. Spence; and a two-page plate of "Nôtre Dame la Grande, Poitiers." The whole is a most attractive number. The price is only one shilling, and copies may be had from the offices, Effingham House, Arundel Street, Strand, or from any bookseller.

Under Discussion.

THE ORIGIN OF THE ARCH.

At the fourth ordinary meeting of the People's Palace Architectural Society, held recently, Mr. Francis R. Taylor in the chair, Mr. Warrow read a paper on "The Origin of the Arch." The principle of the arch as a constructive medium for spanning openings was known by the ancient nations many centuries before the Christian era. In Egypt, India, Persia, Assyria and Greece there were remains of buildings and other indications to show that the arch was known. In all the countries it was originally used as a constructive and not an architectural feature. In the Pyramids two methods were employed for spanning the openings, which undoubtedly showed that the Egyptians were aware of the principle of the arch. In the ascending gallery to the King's Chamber the roof was formed by allowing every succeeding course of stone to project a little beyond the course below until one large stone at the top closed the opening. Other examples of the arch were to be found all over Egypt, notably at the Pyramids of Thebes, which were roofed in by brick and stone arches of semi-circular form. The next appearance of the arch was in Assyria, about the eighth century B.C. These were, however, a considerable improvement on the Egyptian form of arch, one of the best examples being at the city gates of Korshabad. The Greeks were not ignorant of the principle of the arch, but their forms were very crude and infrequent, the best examples being at the Treasury of Atreus at Mycenae, and the gateway at Assos. It was in Tuscany, however, that the arch began to be used, and the Etruscans were the first people who appeared to have understood it. The Roman period of architecture followed closely on the Tuscan, and the arch was now first used as a decorative feature, one of the best examples being the Pantheon at Rome, which had a diameter of 145ft. and was surmounted by one large dome of arch construction. From the semi-circular arch of the Roman period it was not a great step to the pointed arch, resulting in the magnificent building of the Gothic period. A number of lantern slides illustrative of the above paper were shown.

FOR AND AGAINST THE R.I.B.A.

A debate upon the question, "Is the existence of the R.I.B.A. justified?" took place at a recent meeting of the Edinburgh Architectural Society.

Mr. J. A. Williamson, A.R.I.B.A., in opening the question for the affirmative, gave a sketch of the history of the Institute. It was founded in 1834, chartered in 1837, and a medal had been struck in 1846. The membership had increased by leaps and bounds, and now contained 618 Fellows, 290 of whom were from the metropolis, and 328 from the provinces. These figures proved that the Institute could no longer be reproached with being purely metropolitan. The Institute had been consulted several times by the Government, and it had opposed all Registration Bills brought forward by other bodies, but had otherwise encouraged the education of architects. With regard to registration, Mr. Williamson thought that the opinion of the Institute was deserving of respect. Registration would be difficult to carry into legislation. At the start it would be necessary to register good and bad architects alike. Then, was it possible to examine a man as to his artistic abilities? Even eminent architects had been occasionally condemned for their bad taste.

Mr. A. R. Scott introduced the negative side of the debate. He considered that the success of the Institute was due, not to the amount of good it had done to the architectural profession, but to its business-like qualities. All the prominent members were thorough business men, who accepted office possibly on account of the advertisement which such positions afforded. The object of the Institute in opposing registration bills brought forward by other societies was to secure for itself the management of examinations on behalf of the Government. Any man could cram sufficiently to pass the R.I.B.A. in one year, and forget all he had learnt in the same time. Many eminent architects did not ally themselves with the Institute.

Mr. Nobbs, in supporting Mr. Williamson, said that the Institute had been the guide and guardian of the profession. Of all the professions, that of architecture was held in least repute by the public, on account of its being uncertificated. No certificate being required, the architectural profession was adopted by those who had failed in other professions. The examinations of the R.I.B.A. acted as a weeding machine, its only drawback being that its field was limited.

Mr. Gildard seconded the negative side of the question. The provincial members, he thought, received little or no benefit from the Institute examination.

GLASGOW BUILDING REGULATIONS.

These regulations were the subject of discussion at the meeting of the Glasgow and West of Scotland Technical College Architectural Craftsmen's Society held on Friday, November 24th. Mr. R. W. Horn, A.R.I.B.A., who led the opening remarks, gave a summarised statement of the progress of building in Glasgow, and the consequent necessity for new laws and regulations. The first Bills passed, namely, the "Police Acts" of 1862 and 1866, while being good in their small way, gave the authorities little power, and were entirely lacking in detail. This was remedied by the Bill of 1892, and will be brought nearer perfection by the new Bill of 1900, of which a draft copy was shown. After mentioning the method of preparing plans and petitions of proposed work for submitting to the Dean of Guild Court, and their subsequent revision by the Master of Works and the Guild Liners, he criticised the present regulations and the proposed new ones, mentioning points in which they failed, and making suggestions as to remedies. A useful discussion followed.

EDINBURGH ARCHITECTURAL ASSOCIATION.

The opening meeting of the forty-second session of the Edinburgh Architectural Association was held on November 29th in the Royal Institution, Princes Street, Mr. James Bruce, the president, in the chair. In the course of his presidential address, Mr. Bruce touched on the great change that had taken place within a few years in the character of the structures with which architects had to deal. With regard to architects, he thought their association should try to secure that they were well equipped both theoretically and practically for the duties devolving upon them; that their rights were duly recognised, and their responsibilities not unduly stretched. Regarding their work, he thought their endeavour should be that buildings should primarily be safe in themselves, and suitable in design for the purpose for which they were intended, that they should possess individuality, be harmonious and in keeping with their surroundings, and have in as high a degree as possible beauty of form. To those aims he would add another—that their Association should take all means in its power to see that our venerable historic buildings were respectfully cared for, that restorations, when made, were real restorations and not destructions, and that accurate delineations were made of the outline and detail of buildings that constituted the rich architectural heritage that had come down to us from days gone by. On the subject of the equipment of architects, he said they should try to make it imperative that they should possess knowledge of the laws of construction, and that they should have a good grasp of architecture in its historical aspect. At present that equipment was acquired as apprentices and assistants, and they had the school of Applied Art and the Heriot-Watt College. In the University there was a Chair of Engineering and a Chair of Fine Art, but it did seem to him desirable that among the other Chairs in their University for specific teaching they should have a Chair of Architecture. Looking to the wide interest of the subject and its vast importance to the comfort and well-being of the people, it was surprising that their University did not already possess such a Chair. As to their rights and responsibilities, architecture was an art as well as a profession, but still he thought they might with advantage encourage steps towards meeting those in Scotland who practice architecture as a profession in some recognised corporate body. At present, he understood, anyone without the slightest test of qualification might call himself an architect, and be in a position to practice as such. In this matter he thought the public were entitled to be protected. That could be done by architects being required to pass certain tests, and that they had done so could be guaranteed by their membership of some recognised body. Mr. Bruce enlarged on the other aims of the association, referring, among other matters, to the action of successive Governments in their ill-treatment of our old historic national buildings. At the close the president was warmly thanked for his paper.

CHURCH FURNITURE.

When it is remembered what diversity of opinion exists with regard to the proper method of church worship and of religious ceremonies, it is not surprising that, at the debate last Friday evening of the Discussion Section of the Architectural Association, held in their rooms at 56, Great Marlborough Street, W., rules governing the proportions and details of such furniture were laid down by some, and not accepted by others. Mr. Bonner Hopkins presided. At the outset of his paper, Mr. F. C. Eden pointed out how a gas bracket or a hot-water pipe might mar the interior of a church, and the architect could, therefore, not be too particular about the furnishings. Besides being a designer he ought to have a smattering of certain liturgical rules and requirements and ecclesiological traditions, which would better fit him for the work he had undertaken, and prevent any incongruities creeping into the design. No walls looked better for the inside of a church than whitewashed ones, and it was a pity that this was not considered more in connection with the average suburban church, which frequently exhibited many common and vulgar errors that had appeared since the Gothic revival. When funds were small, it should be the architect's aim to have few things and good, rather than many and cheap, and he ought, in this respect, to be able to distinguish between essentials and non-essentials. Assuming that there was a lack of funds, the best order in which to obtain the principal church furnishings was—first, the altar, then the screen, then the pulpit, then the reredos, and lastly the lectern.

Severity should be the note of altar design, for it was too solemn a thing to be trifled with, and stone should be the material employed. The high altar of a parish church should not be less than 8ft. long, and in considering the height of altars it should not be forgotten that they were meant to be accessible without bending or stretching; the modern tendency was to make them too low. After describing the vestments of the altar, Mr. Eden mentioned that the altar end-posts were the survival of the old (and now obsolete) canopy, while the curtains were the relics of the veil which was formerly used to cover the altar at certain times. As regards candles, these should be of wax throughout, and not half dummy; generally, they were much too long. Unless it was possible to spend a great deal of money on the frontal, it was better that this should be of good plain material, and it was well to avoid having a large central and isolated design worked on it.

The reredos might be of stone, though wood itself was admirable, but as it was an accessory and not an adjunct there was no excuse for cheapness in its construction; in fact, it should be particularly remembered that whatever work was done in connection with a church should be good. The triptych, he thought, was perhaps the noblest form of reredos. Flowers and candles formed no part of altar decoration (they were introduced by certain French nuns) and were not needed; neither was a screen an essential, though it was desirable to have one. Care should be taken to see that the altar rails were not placed on the step above the kneeling step, as this was inconvenient. With regard to the chancel, the rage for large surpliced choirs had played havoc with this part of the church, which ought not to be crowded with stalls, while the organ was, as a rule, far too large, a feature that caused detriment to the power of the instrument and to the beauty of the building. Three matters relating to the organ which should be left for the architect to decide were, its size, its position and its case. In the majority of instances the west choir was the best place for it. On no account should the pipes be decorated.

Pews, broadly speaking, were not essentials to the congregation, and in the Prayer Book there was no mention of their being provided, except one for the Bishop. Seating accommodation ought to be provided for the average, and not for an extra congregation; alleys should be wide, and fixed benches should not be introduced unless there was enough money to obtain those of good workmanship and material. Chairs were, perhaps, the most convenient, but they should not be fastened together, as by this means they had the disadvantages of both chairs and benches without the advantage of either. The pulpit was best not placed against the chancel screen, but a good position for it was well up the nave, an arrangement which enabled everyone to hear the preacher. Wood was a better material to use than stone, and a sounding-board was usually an advantage. The font, in England, was never placed in a baptistery or special chapel, and it was essential that it should have a cover, whether it was a plain one or an elaborate one 20ft. high. In concluding, Mr. Eden remarked that the subject of church furniture was a large one, and in compressing it he had been obliged to leave out certain matters—such as lighting—and to state as facts and rigid principles things which were indeed controversial.

Mr. W. Millard thought a "smattering" of ecclesiological and liturgical matters was insufficient for the designer of church furniture, who ought to have a deep knowledge, guided with, what was most important, a proportion of common-sense, which was more than knowledge. He quite agreed that whitewash was admirable for church interiors, and, as a contrast, mentioned how the plaster had been removed at St. Margaret's, Westminster, and the joints of the brickwork emphasised most objectionably with black mortar.

Mr. Rose was of opinion that it was good that so much attention was given to detail, and thought that the hymn-board with the Oxford frame was very undesirable. The seats, said Mr. Lucas, might be painted a very dark green or red, and the height of the pulpit should be such that the preacher's feet were on a level with the tops of the pews. Doors should be fitted to the screen to carry out the original idea of keeping persons out of the portion adjacent to the altar. Mr. C. H. Brodie objected to movable chairs as they made a great noise, while Mr. L. S. Crosbie thought the idea of the screen was not to shut people out, but to give an air of mystery, and said that by placing the pulpit up the nave many of the congregation would require to turn round in their seats in order to see the preacher. One thing which Mr. G. H. Smith felt sure the architect ought not to forget was the poor man's box, an article often of miserable design.

Mr. G. H. Fellowes-Prynne (who was present as a special visitor) said that there was much fashion in the matter of church furniture, and he asked why there was so little feeling in the work of the present time, considering that the men of past days produced work which was full of meaning and spirit. We ought especially to throw ourselves thoroughly into our work. While he did not for a moment wish that the plaster on our old churches should be removed, he thought that plain plaster was not desirable, as a church needed a good deal of colour. The size of the altar, in his opinion, depended on the size of the church, and he did not think it wise to lay down hard and fast rules by which everything should be regulated. A constructional altar looked better than a dressed altar. Objection had been made to a brick interior. The brick in itself, if it were a good brick, was not objectionable, and, as regards flowers, these had been employed from the earliest times, and, in his opinion, were desirable.

CRAFT GUILDS.

A SUGGESTION FOR THEIR REVIVAL.

LAST Thursday night in the New Gallery, Regent-street, W., Mr. T. J. Cobden-Sanderson, honorary secretary of the Arts and Crafts' Exhibition Society, delivered a lecture on "Craft Guilds." He said the movement associated with the Arts and Crafts Exhibition had had the effect of liberating the craftsman from the obscurity in which he worked and of associating his name with the work he did. It was one of the primary objects of the Society to publish the names of the designers and responsible executants of work exhibited at the Exhibition. Many and considerable difficulties had been experienced in endeavouring to achieve this. Sometimes so many executants had been engaged on a work that to give the names of all would be confusing. Some fear had been expressed that the publication of names would lead to disaffection in the workshops, and although the objection had been raised, the present exhibition did not show any tendency to weakening from this cause. The committee had found it difficult to insist upon firms giving the names of workmen when they objected to do so on the ground that this would lead to their losing a good workman or designer who had been trained in their workshops through another firm offering higher pay. The present state of affairs was tracable to the detachment of the designer from the workshop. The lecturer was of the opinion that if a designer obtained a certain price from the public, that was the price he should be paid, and it was but fair that the employer should make every effort to retain his services by paying him his value. To militate against the present system by bringing the designer and the craftsman together was one of the aims of the Society. The question suggested itself: what movement could be taken to bind the workmen into one fraternity? To properly answer this question it was necessary for him to deal with the Craft Guilds of the past and consider the possible application of their principles to present-day conditions.

The first stage in artistic production was that simple age when every man supplied himself or his family with all things required. In the next stage more was produced than for the actual needs of the person; Trade became established, and with that trade Craft Guilds of merchants were formed to obtain privileges of monopoly over the trade of towns. If a trader was prosperous he became a member of the guild, and if he obstinately refused to join, when in a position to do so, he was compelled. The guilds entered, in a great part, into every-day life, and the funds were applied to relieving distress among sick brothers, relieving poverty, &c. About the time of the formation of the first merchant guild in 1093, the number of towns in England was about eighty; most of these we should now consider merely large villages. The total town population of that time has been estimated at 150,000 persons. The origin of the guild idea was immersed in obscurity, some suggesting that it arose gradually from families of craftsmen, but the lecturer thought, from their coming into existence abruptly, that whenever it was found that an association would be advantageous, a guild was formed.

From the twelfth to the fourteenth centuries the Craft Guilds, consisting of artisans, were formed, as apart from the merchant guilds. Whenever, as in the case of England, a country subsisted on other countries, dealers in raw produce would appear; thus the guild of merchants would naturally precede those of craftsmen. The town authorities appeared to have a real authority over the guilds, notwithstanding the almost absolute authority these often exercised over their members. The laws of the guilds appeared to have been passed as a matter of course by the magistrates of the town to which they belonged. These guilds formed part of the administrative system, as was evident where some of the guilds were brought into existence late, simply to enable the authorities to control them, allowing them no judicial authority at all. The regulations drawn up by the craft guilds aimed, by punishment by fines, at prevention of fraud in the selling of work. In addition to the regulations as to manufacture, there were ordinances upon brotherly love, festivities, and common worship.

Capital played a very small part at this time; there was no social gulf between employer and servant, who worked side by side. The craftsman was independent in a different sense from ours. He generally bought his own goods and acted as his own salesman; combining the functions of trader with manufacturer. Members of each craft usually lived in the same street or district, rendering the work of supervision comparatively easy.

In the fourteenth century the guild system reached its greatest efficiency, but in the sixteenth century the influence of foreign trade broke it down. The death of the institution was due to the inevitable expansion of trade and of thought, as well as of manufacture, which rendered control by local jurisdiction impossible, and the Government had to usurp more and more the place of the guilds. Some of the guilds which modified themselves to secular purposes managed to survive as benevolent institutions.

Mr. Cobden-Sanderson did not wish it to be thought that he had any regret for the abandonment of the guilds. In formulating a scheme for the future he had hoped to include the trade guilds of the country, but had come to the conclusion that that was impossible; so he proposed a much smaller scheme, to begin with his own society. He did not speak as one in authority, but merely suggested the scheme as an individual member.

In the past the object of the guilds was to ensure good work, not for the members' own advantage but for the good of trade. A rule ordained that one of a trade should enable others of the trade to finish a work begun, and the first objects were good work and helpful fraternity. The old guilds sought to do this by monopoly and authoritative regulations. These objects might still be made the objects of any society, and the lecturer proposed that they should be clearly established as the objects of the Arts and Crafts Exhibition Society. Their motto should be, "Good Work whether we live or die." It could not be expected to control the members by imposing fines, but it might be done by relying on their honour.

The variety of exhibits showed that they had for the purpose both crafts and craftsmen. Looking, then, at this ideal, he proposed that societies should be formed in the crafts already represented in the exhibition, to adopt the rules of the parent Society, and from time to time hold exhibitions or markets for the sale of their products either separately or together. All would unite in sending their best to the triennial exhibition of the parent society at the New Gallery. Henry Newman, in laying down the principles for the establishment of a University, made a powerful plea that it could not do its work without the Church, which was necessary to its integrity. So, in the speaker's view, good work was the essence of the craft guild, but something else was necessary to its integrity, and this was the Church.

Bricks and Mortar.

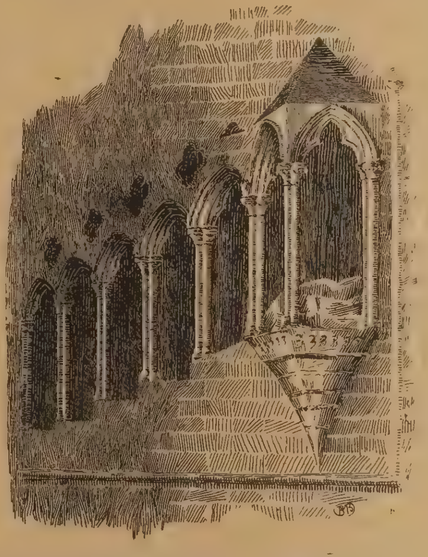
Aphorism for the Week.

"Accurately speaking, no good work whatever can be perfect, and the demand for perfection is always a sign of a misunderstanding of the ends of art."—John Ruskin.

The Fireproofers' Boycott. The executive of the British Fire Prevention Committee have decided to withdraw from participating in the Paris Exhibition. This withdrawal is due to the leading members of the fireproofing trade, who were to have been represented by a large collective exhibit (representing forty-five firms), arranged under the auspices of the Committee, considering that the general tenor of French political, business and social feeling towards Englishmen has of late been anything but satisfactory. After due consideration and conference the Committee fully concur with the firms concerned that this is not an opportune moment for arranging an exhibit of this kind in France. Their own exhibits were to have been of an essentially scientific character. The executive regret that this decision should have been necessary, as the collective exhibit of fire-resisting materials, systems, &c., would have been the first of its kind, and considerable trouble had already been taken in preparations. Whatever opinion this action may arouse, it is a practical example of the influence of national feeling on commercial concerns.

Art and Civilisation. Lord Mayo, president of the Arts and Crafts Society of Ireland, said last week, at a conversazione held at Dublin, that the main intention of their exhibitions was not to promote imitations of known models—a faculty in which Irish workmen and workwomen had long shown themselves unsurpassed—but to suggest to the artisan, to whom every golden age of art owed its greatness, the invention of new forms or new combination of older ideas. The higher civilisation of every country depended upon a keener and more perfect sense of beauty more than upon liberties or luxuries, which could not be universal, and which might often mar their own high promise. In the cultivation of beauty, not only in its loftier sense but on its practical side, by proper designs, by proper adapting of means to ends, by combining simplicity with elegance, every man and woman, nay, even every intelligent youth, could help to make life better and purer, and, therefore, happier; for here the many and the few, the poor and the rich, the native and the settler, the producer and the employer, could combine and contribute to their country's good. Their efforts were directed to efface, as far as is possible, the distinction between the artist and the artisan, and to carry the contemplation of beauty from public galleries and buildings into the homes of the people and into their daily life.—In replying, the Lord Lieutenant (Earl Cadogan) said that he believed there were certain lines and forms in decorative art which had existed for centuries, and which, gradually adopted and possibly improved upon, had formed the staple of what is real and true decoration. He did not himself believe that we should ever do anything better than the older forms of decoration, of which there were so many specimens to be found in the Irish crosses and other monuments of Ireland. But those forms of decoration could easily be adapted to more modern requirements. With regard to what Lord Mayo had said about the value of beauty in civilisation, he thought that if we could do anything to encourage beauty, not only in decoration, but in all other forms of artistic work, we should undoubtedly be doing a great deal not only to improve the taste but really to secure the happiness of those whose welfare was considerably influenced by the beauty or the reverse of their surroundings.

Westminster Bridge. A correspondent of the "Standard" draws attention to what he terms a ridiculous waste of public money by the London County Council on Westminster Bridge by substituting a granite curb for the present cast-iron one, which was in good condition, and has stood well from the opening of the bridge on May 24th, 1862, until the roadway of the bridge was wood paved: since then the wood-blocks, after two or three days' rain, have swollen on several occasions sufficiently to force up the curbing on the south side of the bridge, a fortunate occurrence, he says, or the bridge would have been subjected to a side thrusting stress which it was never contemplated by the designer of it that it would have to withstand. He contends that the substitution of a granite curb for the present cast-iron one will not prevent the liability of the bridge to injury from the side thrust of the wood paving, and consequently (if this is the Council's idea) the present work is a waste of public money, and may even be worse, for whereas the bridge, after being subjected to a considerable strain, formed for itself a stress outlet, it will now have to do this again, with the probable result of considerable injury to itself, and the likelihood of, one day, some of the balustrading being found in the river, and some of the main cast-iron cantilevers being broken. Let us hope that these grim forebodings will not be realised. On the face of it, however, the warning seems to be well-founded, and we hope it will not be overlooked by the Council's engineers.



EARLY ENGLISH PULPIT IN THE REFECTORY AT CHESTER. DRAWN BY MISS B. M. BENNETT.

Early English Pulpit. The early English pulpit illustrated on this page is in the refectory at Chester, which is part of the cathedral building, and is entered from the cloisters. The cathedral buildings formerly belonged to a monastic order, and, as frequently happened, one monk read aloud while the rest of the fraternity were dining—which is probably what this pulpit was used for. There is no entrance to it from the refectory, access being had from a room beyond, through a door at the further end of the pulpit. It is supposed to be a very fine specimen of early English arcading. The drawing is by Miss B. Marian Bennett.

Manchester Cathedral Bells. There are ten bells of four different dates in the cathedral tower at Manchester. The Rev. H. A. Hudson said at the meeting of the Lancashire and Cheshire Antiquarian Society last Friday that as the earliest date of the casting of any of these bells was 1706, they could not be said to possess that peculiar interest which surrounds ancient bells. He described some of the bells in the immediate neighbourhood, especially the small ancient bell at Clayton Hall. As regards the Manchester Cathedral, Warden Langley, of Prestwich, made a gift of bells which lasted until 1679. The peal was then one of five, and the recasting of these, with the provision of an additional bell, was entrusted to William Noon, of Nottingham, who at that time was probably a young man. At any rate, he did his work so ill that in less than thirty years the whole peal had to be recast. Eventually, in 1704, the wardens were directed to recast the whole of the bells. They ordered a peal of eight, which were cast in Gloucester. How well the work was done was shown by the fact that six of these eight bells were as sound to-day as when cast. The sixth, and the tenor, had undergone recasting. In 1825 two additional bells were added.

The Freemasons' Dilemma. The Freemasons of Leeds, having long felt the inconvenience arising from premises inadequate to their needs, decided some time ago to build for themselves a new abode, on which it was proposed to spend £6,000. Plans were adopted quite recently, and everyone expected that the building would be commenced. But an unforeseen and peculiar difficulty has occurred, which prevents a start being made on the work, and throws the promoters of the scheme into very considerable anxiety—and, perhaps, wrath. The facts are these. At the last meeting of the Leeds City Council sanction was given to the project for widening and straightening Cookridge Street, which involves the purchase and demolition of the Roman Catholic Cathedral, schools, and presbytery. It is proposed by the Corporation to schedule land eighty-four yards back from Cookridge Street, the area thus affected comprising 14,625 yards between Great George Street and Guildford Street. The ear-marked land includes the new Masonic hall site, containing about 650 square yards, which, it is understood, the Improvements Committee intend to offer to the Roman Catholic authorities in substitution for the site now occupied by St. Ann's Cathedral and the adjoining buildings. This proposition has naturally put the Freemasons in a fix, for they had been congratulating themselves upon soon being installed in a more commodious building than they now possess. They say they experienced great difficulty in obtaining a suitable site, and that if they are deprived of it they will be put to the utmost inconvenience. It is not absolutely certain that the Roman Catholics would be prepared to build a new cathedral in the locality. The Freemasons are now taking vigorous steps to prevent their proposal being postponed indefinitely, and it is probable that at the next meeting of the City Council there will be much commotion about the matter.

Ugly London. Mr. William Emerson, the president of the Royal Institute of British Architects, referred recently to the ugliness of certain parts of London, and this has prompted a correspondent of the "Pall Mall Gazette" to state that Paris, as we see it, is universally admitted to be a model of what a city should be. Though London cannot now hope to rival its French neighbour, it possesses a degree of picturesqueness and a restrained and dignified beauty which some painters, notably Whistler, have been quick to recognise, in spite of the fact that Ruskin himself compared the architecture of Gower Street with that of the Grand Canal of Venice, to the obvious disadvantage of the former. The object of the correspondent's remarks is to draw attention to a huge building at Knightsbridge, built of stone and brick, which rises on a substructure entirely composed (to all appearance) of sheets of plate glass; the girders are concealed. Though a great expanse of shop front is often demanded, it should surely be curtailed by the most elementary architectural and artistic demands, which, in this particular case, seem to have been ignored. The correspondent concludes thus: "The building, indeed, is secure, and may last for ever. So long as it does, it may serve as a gruesome warning to long-suffering Londoners not to allow the finest sites in their capital to be usurped by ill-designed and inadequate buildings."

Millais. "Of all the painters of our time he was perhaps the least beset by those poetical and intellectual tendencies that have sometimes inspired, and sometimes wrecked, the achievements of others." So says Mr. Comyns Carr in an article on the late Sir John Millais, the "Speaker." Rossetti said of him: "As a mere painter he was head and shoulders above us all!" Continues Mr. Carr: "It was a happy thing for Millais that his work in those earlier days was informed and refined by one whose imaginative impulse was greater than his own. Every man is a poet in his youth; but the simpler sentiment that composed the fabric of Millais' boyish ideal would scarcely have sufficed to give that subtlety of truth to his youthful experiments, unless for a time his individuality had come under the sway of the man he describes as 'the un-English Rossetti.' Indeed, throughout the efforts of his later life, when that influence had been clearly effaced, it may be seen how often Millais' extraordinary mastery over nature left him sometimes its slave. As the extraordinary accomplishment of his earlier days shows something of the mastery of the man guiding the half-tutored hand of the boy, so in all his later work there is to be found something of the *naïveté* of the boy still controlling the riper product of maturity. To the end of his life Millais, even in his painting, was always at school; and, when his work was completed, he had still something of the air of a schoolboy on his way to win a prize."

Egyptian Archæology. In July last a very interesting small temple was discovered at Karnak by natives who were digging there. M. De Grain was telegraphed for from Cairo, and he had the rubbish cleared away, and laid bare a small chapel belonging to the period immediately preceding the Ethiopian invasion under Sabako—the So of the Old Testament. A large number of very interesting papyri belonging to the time of the twelfth dynasty were also discovered at Illahum, in the Fayoum, as the result of excavations prosecuted by a German society, provided with funds by the German Government. The fact that all archæological societies on the continent of Europe are supported by their respective Governments is suggestive in connection with and in contrast to the attitude taken by the British and American nations in this regard. For precedent with the Governments of these richest and most powerful of peoples has never run to patronage in the direction of archæology, and now it seems scarcely likely that it will be otherwise, notwithstanding the potency of British influence there. For three years past the columns and walls of the Temple at Karnak have been strengthened and supported where it was judged expedient. If more funds had been available it is possible that the eleven columns whose recent fall is so lamentable might have been upheld. They will now have to be set up, as well as supported when reinstated, and the Caisse will be petitioned to come to the rescue in the matter of needful monetary equipment for the work. This is estimated by M. de Grain to cost about £7,000. English initiative as regards matters archæological has, however, begun to make itself felt. The instance of Viscount Cromer's reappointment to the headship of Ghizeh Museum of M. Maspero has been approved by all who have the interests of research at heart, and another step in the right direction—an innovation—is the selection of two Englishmen, Messrs. Quibell and Carter, to be inspectors of the monuments and antiquities in Upper Egypt. The Egyptian Exploration Fund has been granted a concession and will send a party of excavators to Abydos, where Professor Petrie will conduct their operations. Brick buildings are being put up on the spot for the accommodation of the excavators. A further concession has been granted also to an American society for excavating at Coptos, where the ancient cemetery in the desert to the east of the town was discovered this summer by natives.

R.I.B.A.

THE NOVEMBER EXAMINATIONS

A BUSINESS meeting of the Royal Institute of British Architects was held last Monday evening at No. 9, Conduit Street, Regent Street, W., Mr. William Emerson, the president, in the chair. The minutes of the previous meeting having been confirmed, on the motion of Mr. Alexander Graham, hon. secretary, a vote of thanks was passed to donors of books recently given to the library of the Institute.

The following gentlemen were then unanimously elected members of the Institute:—As Fellows: Francis William Bedford, of Leeds; James Garry, of West Hartlepool; Josiah Gunton, of London; Edward John Lowther, of London; Robert Falconer Macdonald, of London; Herbert Read, of London; Thomas Taliesin Rees, of Birkenhead; and Francis William Troup, of London. As Associates: Raymond Turner Barker, of London; Henry Thomas Bromley, of London; Herbert Henry Dunstall, of Chatham; Hubert Ernest Gilford, of Purley, Surrey; Charles Hale, of Wellingborough; John Hunt, of London; George Ernest Kendall, of Humberstone, near Leicester; Thomas Geoffry Lucas, of London; Henry Alfred Neubronner, of Penang, Straits Settlements; Walter Gray Ross, of London; William Moss Settle, of Walney, Barrow-in-Furness; Thomas Sharpe, of Manchester; Vincent Steadman, of Bristol; Henry Francis Traylen, of Leicester; Thomas Hubert Hardinge Vowles, of Oldham; and Percy John Warman, of London. As Honorary Associate: The Rev. John William Robbins, M.A., of London. Mr. W. J. Locke, secretary, then read the following list of candidates who have passed the November Examinations of the Institute:—

Preliminary.—G. N. Beaumont, P. R. Berry, H. R. Bird, H. T. Bowell, G. R. Bower, M. S. Briggs, W. E. A. Brown, H. P. Buckingham, E. H. Bullock, C. F. Burton, H. Byron, A. J. P. Carrington, E. L. Cashmore, N. S. Chedburn, O. H. Cockrill, W. J. C. Coulson, A. R. Crisford, T. T. Cumming, R. S. Dacombe, E. A. Dakin, A. F. H. Daniel, W. Davidson, T. E. Davies, A. Dicken, H. Dru Drury, C. C. Duggan, R. K. Ellison, J. P. Firth, A. W. Fletcher, LL.B., Sir F. C. R. Ford, Bart., A. Gilpin, G. R. Griffith, E. L. Hampshire, T. Hansom, W. Haywood, S. T. Hennell, T. H. Hill, W. H. Hillyer, G. S. Hoffmann, B.A., G. Holmes, G. L. Hudson, M. Idle, E. A. Jackson, W. B. Jemmett, N. Jewson, F. G. Johnson, J. T. Johnstone, H. W. Kefford, F. W. Longman, L. Leeper, J. Lees, H. M. Lewis, P. S. Little, B. M. Lloyd, F. J. Lucas, W. H. Ludlow, A. G. Maitland, H. J. Manchip, E. J. Martin, F. P. Martin, J. Martland, C. J. M. Mason, O. P. Milne, H. A. Moon, L. T. Moore, E. B. Muff, P. C. Newcombe, C. E. Okely, S. H. Penlington, J. Petter, E. Procter, E. Quail, H. C. Quérée, S. C. Ramsey, H. Rigg, F. A. Rogers, G. W. Rogers, T. J. Rushton, S. Seale, G. M. Seels, H. F. Sharp, W. C. Short, J. M. Smith, R. G. Spiller, H. B. Squire, W. Steel, A. F. V. Stevenson, G. W. Stokes, F. G. Strudwick, W. J. M. Thomasson, E. H. Walker, A. F. Warth, C. S. O. Watson, A. F. Wickenden, F. W. Williams, W. F. Wills, J. G. Wilson.

Intermediate (in order of merit).—H. Chapman, G. L. Russell, C. W. Beaumont, E. D. Brown, C. A. Broadhead, W. H. Swann, J. P. Hall, C. G. Besant, R. Berrill, C. V. T. Hodgson, C. E. Varndell, E. L. Wratten, E. M. Joseph, G. H. Onions, W. J. Nash, J. J. Wood, C. M. Childs, W. C. Oman, S. Towse, R. P. Blakey, S. G. Hewitt, A. J. Mays, P. S. Widdup, A. Symons, G. F. Ely, H. T. Bill, A. R. Conder, W. E. Couch, T. Gregg, L. A. Jones, L. Lee, R. McM. Roberts, D. West, F. C. W. Wheeler, C. Woodward.

Final (qualifying for Associateship).—F. H. Allen, W. H. Ansell, S. E. Barrow, F. W. A. Buckell, T. J. Byrne, B. A. Charles, D. Mc. L. Craik, A. H. Foster, F. Foster, S. H. Hamp, J. H. W. Hickton, M. Honan, H. E. Illingworth, A. R. Keighley, T. A. Moodie, J. E. C. Shield, J. E. Spain, R. H. Spalding, F. Taylor, R. Traquair, T. Tyrwhitt, H. Watts.

The president then announced that, as Mons. Charles Lucas had been for the second time unable to complete his paper on "The Building of the French Exhibition of 1900" in time for the next meeting on December 18th, owing to the unfinished state of the buildings, Mr. Thomas Blashill, F.R.I.B.A., would read a paper instead on "The Architect in relation to Fire Prevention."

Keystones.

A new organ at St. Andrew's Church. Avonmouth, Bristol, has been provided at a cost of £500.

At the Yorkshire College, Leeds, new leather industries buildings have been erected by the Skinners' Company at a cost of £5,000.

A new Free Church at Aberlour has been built from designs by Mr. Macmillan, of Aberdeen. The total cost will be about £1,400.

A new Baptist Chapel at Netherfield, Nottingham, has been built, at a cost of £1,250, from designs by Mr. W. H. Higginbottom, of Nottingham.

A new Promenade Pier at Lowestoft is to be built at the north end of the borough at a cost of £60,000, and the Duke of Cambridge cut the first sod on Saturday. The pier will be 233 yards long.

Big Electric Tramway Project at Rochdale.—A parliamentary Bill is being prepared at Rochdale applying for authority to construct a working system of electric tramways within the borough, and for the whole of the authorities immediately adjoining, embracing a total length of about eighteen miles. The total expenditure contemplated is about a quarter of a million. It is intended to alter the gauge of the tramways from the present one of 3ft. 6in. to the standard gauge of 4ft. 8½in., with a view to link up with the systems of the neighbouring authorities of Oldham and Bury, which, in their turn, will probably connect with Manchester and other important centres of population. The Bill also seeks power to construct several new streets and to widen others. This will involve a further expenditure of about £50,000. The Corporation is at present installing an electric lighting station, which has been designed to provide the electrical energy for both lighting and traction purposes.

Swansea.—The new poor-law offices that have been built at the foot of Clifton Hill were opened last Thursday. Erected at a cost of £6,219, the building is in the English Renaissance style, and is intended to accommodate not only the different bodies responsible for the administration of poor-law in the Union, but also the Llangyfelach District Council. The elevation—which, though not imposing, is very attractive—is in old brick with Bath stone dressings. Inside there is a fine stone staircase and balustrading, with an arcade on the ground and first floors, and the rooms include the offices of the clerk of the guardians, office of registrar for births and deaths, relieving officers, a large waiting-room for applicants, committee rooms, board rooms, District Council surveyor's office, stores, and strong rooms. The board room is 30ft. square and 23ft. high, with a plastered domed ceiling, oak panelled, and lighted from the top and also by a large side window. Although the board room is on the first floor, the difference in level of the site has enabled an entrance for applicants to be placed on a level with a road at the junction of Clifton Hill and Clifton Row, thus enabling the applicants to enter the board room without going up any steps. The architect was Mr. H. W. Wills, A.R.I.B.A.; contractors, Messrs. Lloyd Brothers; furnisher, Mr. E. Norman, Orchard Street; clerk of works, Mr. Thomas White. The contracting work has been well done, giving unqualified satisfaction to the guardians and to the architect. Messrs. Lloyd's own smith made the ornamental wrought-iron entrance gates, &c.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

GEOMETRY BOOKS.

Torquay.—Oliver Twist writes:—"What do you consider to be the best book on geometry—Science Subject I.?"

Angel's Practical Plane and Solid Geometry, price 1s. 6d.; Rawle's Practical Geometry, 1s.

R.I.B.A. PRELIMINARY.

London, E.C.—In reply to A. P., the subjects given in the Preliminary R.I.B.A. Examination are (1) Short English Composition; (2) Writing from Dictation; (3) Arithmetic, Algebra, and Elements of Plane Geometry; (4) Geography and History; (5) Latin, Italian, French or German: one language to be selected by candidate; (6) Geometrical Drawing or Elements of Perspective: either subject to be selected by candidate; (7) Elementary Mechanics and Physics; (8) Freehand Drawing from the Round.

SCIENCE AND ART DEPARTMENT EXAMS.

Grimsby.—C. E. T. writes:—"I shall be glad if Professor Adams will tell me whether I can obtain answers to the questions set in the elementary and advanced stages of building construction from the year 1894 to 1899 inclusive? I believe he was the author of a book containing answers up to 1893. Also, what is the price, and name of the publisher of Spooner's "Practical Solid Geometry," which was recommended as a suitable book for the R.I.B.A. intermediate examination?"

Solutions to the examination questions in building construction for 1894 were published by Chapman and Hall in *Science and Art*; those for 1895 by Whittaker and Co., in the *Technical World*; those for and since 1896 by Cassell's in *Building World*. Spooner's "Practical Plane and Solid Geometry" is published by Cassell and Co., price 3s.

HENRY ADAMS.

CALCULATING BENDING MOMENT.

Lee, S.E.—P. F. writes:—"On page 211 of E. W. Tarn's "Science of Building," 1890, it is stated that if a joist is required to carry double the usual load, multiply the depth by 1·414; but in his "Mechanics of Architecture," page 89, it is stated that to double the strength of a joist, multiply the depth by 1·26. The former multiplier represents the rule that the strength is in proportion to the square of the depth, for 1·414 is the square root of 2, while 1·26 is the cube root of 2. Can anyone explain how this difference arises, or which multiplier is the correct one?"

The bending moment varies as $\frac{fo}{6}\ bd^2$, where *fo* is the modulus of rupture, and *b* and *d* are the breadth and depth in inches respectively. Therefore, with a constant load and span (and, consequently, a constant bending moment), and also constant modulus of rupture (the material being the same) and constant breadth, the depth will vary as d^2. Consequently, 1·414 is the correct multiplier.

G. A. T. M.

WORKING GELATINE.

Gourock, Scotland.—Stucco writes:—"Please inform me where I can purchase gelatine for moulding stucco enrichment. Also, can I use glue for moulding, and is it best to paint the moulds?"

A first-class gelatine for moulding purposes may be purchased from Messrs. J. G. Smythe and Co., 1, Pleasant Place, Islington, London, N. Gelatine moulds when indurated with a solution of alum and oiled with gum-oil require no painting. Glue is sometimes used for moulding, but the moulds must be painted to protect the surface from the heat of the plaster. Painted moulds, when remitted for use again, always work hard and coarse, besides losing their flexibility. Gelatine, though three times as costly as glue, is the cheapest in the end, as the moulds can be used for casting at once, whereas glue moulds cannot be used until the paint is dry; besides, the gelatine lasts longer and yields cleaner and sharper cast work.

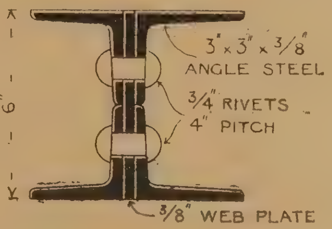
W. M.

CANTILEVERS FOR CARRYING GALLERIES.

Glasgow.—S. H. writes:—"Would one of your staff of experts kindly advise me as to the following points regarding cantilevers carrying gallery in a public hall, of which I herewith enclose a tracing. (1) Are the scantlings of the various members, as figured, sufficient, and is the material disposed in the most economical manner? (2) What weight must be applied at A to render the cantilevers perfectly stable?"

The weight of men in crowds may be taken as 80lb. to 100lb. per foot super; a dense crowd cannot exceed 1cwt. per foot super actual weight. But for churches and public buildings the usual allowance is $1\frac{1}{2}$cwt. per square foot = 168lb., to provide againt vibration from the load being a live (and possibly lively) one. To this must be added the weight of the structure itself. Area supported by each cantilever $8 \times 7{\cdot}5 = 60$ square feet. External load $60 \times 1\frac{1}{2} = 90$cwt. Weight of structure say = 10cwt. Total load = 5 tons distributed on each cantilever or $\frac{5}{8}$ ton per foot run. The bending moment at the weakest part, viz., where the upper side of cantilever leaves the horizontal, will be $\frac{5}{8} \times 2{\cdot}5 = \frac{3{\cdot}0}{2}$ = say 24in. tons from the distributed load + say $0{\cdot}1$ ton $\times 30 =$ 3in. tons from gallery front = 27in. tons in all. Let the mean depth be 4in., then the flange stress will be $\frac{27}{4} = 6\frac{3}{4}$ tons. The sectional area of mild steel necessary to resist this would be about 1 sq.-in., so that a section as in accompanying figure would be ample, with a $\frac{3}{8}$in.-triangular plate in the spandril continued to back; and double $3 \times 3 \times \frac{3}{8}$ stiffeners at face of wall and at back of cantilever. Each cantilever should rest on a good piece of cubestone projecting as a corbel and tailed as far into the wall as possible. It would require twenty tons on the back of the cantilever to hold it down under a full load, and it may be necessary to anchor it down by a strap bolt on the back carried well down into the wall with a $9 \times 9 \times \frac{1}{2}$-washer on the lower end.

HENRY ADAMS.



SECTION OF OUTER END OF CANTILEVER.

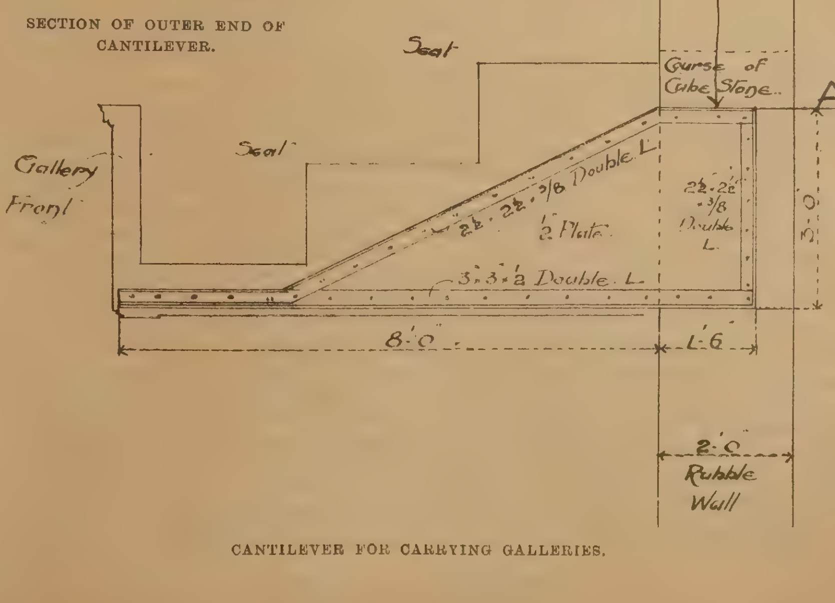
QUANTITY SURVEYING.

Plymouth.—Methodical writes:—"Will you please inform me the correct order of 'taking off.' On referring to Leaning's, pages 20 to 29, I find an 'order' is given. Does this mean that you must at one time take all digging, all concrete, all walls, all fires, all internal openings, all facings, and so on throughout the entire building; or should you measure everything (of every description) up to one level before taking any work above that level? Will you also please inform me if it is possible to obtain a model set of drawings for a small building, together with papers showing the 'taking off,' 'abstracting,' and 'billing' of the quantities. Does Leaning's set of 'Contract Documents' include the 'taking off' papers? By having these latter one could trace the dimensions on drawings and so ascertain the correct order and method of doing this work."

The reference given is to the second edition of Leaning. In the third edition two lists appear which differ somewhat in their order from each other. The first list is the same as in the second edition, and the second one is modified to deal with the various parts more completely at one time, so that no return to them is required, and a continuous series of dimensions may be omitted if any part is not to be executed. As a rule to keep in view, the work should be taken off in the order in which it is executed or fixed, but this has many exceptions. The list is pretty clear as to what should be taken, and when it gives an item it means all the work or material of that sort that comes under the heading of the group. Leaning's "Set of Contract Documents" includes drawings, dimensions, abstracts and bills complete for a small building. It is good practice to go through these and find where every figure comes from, but it is somewhat difficult as a few errors have crept in, and every one has his own way of taking off, some part of which can hardly be brought under rules.

HENRY ADAMS.

A new Fire Station at Islington, N., the foundation stone of which was laid on Saturday, is being built under the superintendence of Mr. Reilly. It will cost between £14,000 and £15,000.



CANTILEVER FOR CARRYING GALLERIES.

New Patents.

These patents are open to opposition until January 8th.

1898. — Road Sweepers. — 20,712. R. Wadsworth, Halifax. Under the axle of the cart is removably attached a bin which receives the sweepings of the road from a circular brush at the back of the vehicle; this brush is revolved by a chain belt connected with the main axle. To enable the gutters to be swept, a brush is provided at the front extending outside the wheel at one side. The dirt which it sweeps up is transferred by the back brush into the bin, which has a hinged flap that can be jerked upwards by the man in charge to throw the dirt into the forward end. Several modifications are included in the invention, one of which provides a dirt elevator.

Distributing Enamel Powders.—27,030. J. Shanks, Barrhead. This is a device for rapidly applying the powder employed for enamelling such articles as baths, so that the coating may be as equal as possible—the bath being heated at the time. The powder is contained in a round box, having a wire gauze or perforated metal bottom, mounted at the end of a tubular handle. In this handle is a spring controlled rod connected at one end with the powder box, and at the other with a pneumatic or electric hammer or ratchet. By this means a rapid and regular vibration is set up, causing a uniform delivery of the powder.

1899. Heating Stoves.—71. R. Haddan, London (*H. Schuppmann, Berlin*). To avoid disagreeable smells and to afford a more economical use of the gases, the heating boiler is connected with a water mantle and expansion vessel, together forming one heating body. The products of combustion go first through the boiler, and are afterwards taken into the expansion vessel, whence they pass into the flue.

Brick Presses.—172. T. C. Fawcett, Leeds. In presses where the sides comes together by means of toggle levers, india-rubber is provided to prevent the jambing of the moulding box. The outer sides of the plates are inclined. By these means the arrises of the brick are made keen and sharp.

Combined Pile Driver and Crane.—2152. Isles, Ltd., Stanningley, and E. Tempest, Marple. Pivoted to the top end of the crane jib are two guides, between which a monkey works up and down in the usual way. Two adjustable side beams extend straight out from the bottom of the jib and hold the guides firm. A ladder is provided at one side of the guides, and the ordinary chain mechanism is provided. When not required, the monkey can be unhitched, and the guides and side beams swing up against the jib, and fastened there. The apparatus can then be used as a crane.

Nails.—17,979. D. Ascoli, London. The body of the nail is similar in shape to a candle flame, and points are provided around the head. This formation claims to make fastenings more secure.

Artesian Wells.—19,407. P. J. Moran, Memphis, U.S.A. Instead of connecting the various artesian wells to the main pumping well by underground tunnels, they are connected by syphon pipes extending near the surface. This reduces the cost and makes cleansing easier.

The following specifications were published on Saturday last, and are open to opposition until January 15th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—23,376, Buzzard, hoists. 23,562, Hutton, utilisation of precipitated sewage sludge. 23,754, Cooper, appliances for fastening the handles or stales in brushes, brooms, &c. 24,188, Villaret and Wahlen, drying apparatus for bricks. 26,284, Lee, disinfecting apparatus for water closets. 26,403, Day, waste-water closets. 27,173, Rowe, manufacture of bricks. 27,396, Wellard, ball and float valves.

1899.—877, Shanks, water closet apparatus. 1,178, Ashworth, method of attaching door and other knobs to spindles. 1,393, Baxter and Taffs, urinals for invalids' use. 3,527, Sellars, coverings for surfaces. 3,969, Pickup, fastening devices for casements, sashes, doors, &c. 5,943, Stampacchia, method of and apparatus for manufacturing hollow ware. 6,306, Cerebotani, instruments for drawing curves. 11,957, Turski, process for the manufacture of oil colours. 14,546, Ham, method of and apparatus for coupling or connecting lead or composition pipes to pipes, taps, &c., also for stopping such pipes. 16,623, Manning, skylights, windows, &c. 18,407, Edwards, clips for fastening and fixing of pipes to walls. 18,819, Heinz and Heinz, blowpipe lamps. 19,192, Allison and English, drying bricks, earthenware, cement, slurry, and the like before burning, or for drying salt, whiting, &c. 19,287, Fiske, manufacture of bricks and the means or apparatus employed therein. 20,139, Catkosinski and Weintraub, manufacture of bricks, tiles, artificial stone, &c.

Professional Practice.

Leeds.—The new Congregational church and schools about to be erected in Woodhouse Lane are estimated to cost £13,500 (exclusive of the land), and have been designed by Mr. G. F. Danby, of 10, Park Road, Leeds. The area of the site is about 2700 square yards, and the buildings will be of stone, in the Perpendicular style of Gothic architecture, somewhat freely treated. The church, capable of seating 800 worshippers, will comprise a wide nave, with narrow aisles, transepts and apse; the latter will be appropriated to the use of the choir, with organ-chamber at one side. At one end is an open porch which forms one of the main entrances and leads to a vestibule, over which is placed a seven-light traceried window terminating in a gable, with small turrets at the angles. At the junction of the nave and transepts next to Woodhouse Lane, the tower, with spire, rises to a height of 130ft. In the lower stage of this is another main entrance. The aisles are divided from the nave by stone columns with arches, over which are the clerestory windows. At the end of the apse is another seven-light traceried window, which is intended to be filled with stained glass. Provision will be made for the erection of galleries in the transepts, these to be approached by staircases and wide corridors connecting the church with the schools and vestries. The school or lecture hall is 64ft. by 34ft., placed at the top portion of the site, with boys' and girls' entrances from Woodhouse Lane—one on each side of the main gable, which will contain a five-light traceried window and have angle turrets. Opening out of the schoolroom eight classrooms are arranged. The two larger ones are situated so that they can be added to the schoolroom when required, by means of patent folding partitions. A large ladies' parlour, pastor's and deacons' vestries, infants' rooms, and the caretaker's quarters face Hillary Place. These will form a compact group.

Skipton.—The new Skipton and District Hospital will have cost, when entirely completed, £7,238. Mr. E. C. H. Maidman, of Edinburgh, is the architect. The building is in the domestic style of architecture prevalent in Yorkshire. On the ground floor, to the right and left of the entrance, are male and female wards, each with accommodation for six beds. There is also a private ward, for two beds, which may be used as a day-room or for paying patients. Near the entrance on one side is the operation room, and the nurses' sitting-room is on the other. The kitchen and offices are at the rear. The first floor contains the matron's sitting-room and bedrooms for the nurses' and servants, including sleeping accommodation for the two nurses of the Town Nursing Association. A detached building has been erected for a laundry, and a mortuary is attached to it.

Keystones.

The death is announced of Mr. T. Powis Reynolds, a well-known architect in Haverfordwest.

The builder of Cromwell Road, South Kensington, S.W., Mr. Thomas Huggett, has died.

Change of Address.—Mr. C. F. A. Voysey has removed from 6, Carlton Hill, N.W., to 23, York Place, Baker Street, W., and Chorley Wood, Hertfordshire.

"One of the Seven Wonders of Wales," Wrexham Church, is proposed to be restored. The Duke of Westminster has promised to give £2,000.

Public Baths at Romford are now being built from the designs of Messrs. Harrington and Ley. They will comprise a swimming bath, 70ft. by 30ft., and six slipper baths.

New Market Hall, Leeds.—The first premium in this competition, amounting to £150, has been awarded to Messrs. Leeming and Leeming, of London. The estimated cost of their building is £73,000.

The Queen Victoria Gallery in the Central Public Library, Manresa Road, Chelsea, is now open to the public, and has been adapted for the permanent exhibition of illustrations and memorials of this historic parish.

Emmanuel Church, St. Thomas, Exeter, was opened last Thursday. Mr. Pratt, of Clyst St. Mary, Exeter, was the contractor. The church is in the Early Perpendicular style of the fifteenth century, and the total cost has been about £8,000.

Bournemouth Extensions.—At the last meeting of the Town Council it was decided to apply for powers to take in some 1,400 acres of common land for plantations, &c. The council have also decided to promote a Bill in Parliament to obtain powers to erect a crematorium at the East Cemetery at a Cost of £3,000.

The wonderful old Castello of Milan, which for years past has been undergoing restoration under the supervision of a body of well-known Milanese architects, archæologists and artists, is approaching completion. The Museo Archæologico (which contains many fine marbles) and the Museo Municipal are now housed in it.

The War and Artists.—At a meeting held on Thursday last under the presidency of Sir Edward Poynter, P.R.A., supported by many of the most celebrated British artists, it was resolved that a committee of the artists of the United Kingdom should be formed forthwith with a view to promoting an exhibition and sale of works of art in aid of the Mansion House Fund.

Coal Smoke Abatement Society.—At the usual fortnightly meeting of this society, held last week, Sir W. B. Richmond presiding, it was reported that about £100 had been received during the last few days to carry on the crusade against "Smoky London": hundreds of letters from all parts of the country, promising support to the movement, had also come to hand.

The Karnac Columns.—Mr. Hilton Price says in the "Egyptian Gazette" that the cause of the disaster in the Hypostyle Hall on October 3rd is ascribed by the Government commission to the removal of the *Sebakh* and other *débris* from the floors of the Temple, which, it appears, supported the bases, and has caused the water to have more play round the bases, already weakened by the infiltration of salts. Mr. Price adds that other columns in the hall are shaky, and may fall.

The Christmas Catalogue, 1899.—We have received a copy of this useful guide to the present season's books, periodicals, &c. Although issued primarily for the bookselling trade, it is full of useful and interesting matter likely to appeal to all book lovers, especially to those who are on the look out for suitable books for Christmas presents. It is published from the offices of the "Newsagent and Bookseller's Review," at 190, Fleet Street, E.C.

Trade and Craft.

CONCRETE AND MOSAIC FLOORS.

The patent granite concrete paving which Messrs. B. Ward and Co., of 15, Great George Street, Westminster, S.W., supply for cow houses and stables is non-absorbent, durable, and is laid down *in situ*, and, being in one piece, there are no joints into which urine can percolate, generating ammonia and injuring the health of the animals. V-grooves are formed in it, and the main channels have a segmental bottom covered by a removable cast-iron grid. This paving is approved by the War Department. Messrs. Ward's improved and registered system of stable drainage consists in having a stable pot, with a box to lift out, inside the building, connecting with an interceptor trap outside, a ventilating pipe being provided between the two if thought necessary. The solid concrete floors made by the firm have a strong steel webbing running through them, while for their patent fireproof, soundproof, and ventilated floor, cellular gypsum slabs, 2ft. 6in. long, 1ft. wide, and about 5in. deep, are used, which are light and strong, afford a thorough protection to the ironwork, and leave a true and level soffit. Gypsum has the demerit of expanding under heat when used in large masses; the slabs used for these floors are, however, fixed between iron or steel joists and filled up to the required level with concrete. The conductivity of gypsum is one-fourth that of slate and less than one-half that of firebrick, so that it is an excellent material for fireproofing —when used carefully. Messrs. Ward also make several kinds of hollow partitions, artificial stone staircases, heads, sills, cornices, chimney pieces, &c., stair treads and wood block flooring. The designs for mosaic floors given at the end of their latest catalogue are very pleasing. The firm could have no better recommendation than the long lists of works which they have executed, which include commissions from the Government, the nobility, and leading companies and corporations throughout the kingdom.

HEATING APPARATUS.

"We have noted with the advance of the science of heating, a corresponding increase in the manufacture of apparatus wholly inadequate to perform the work that is required of it, to any degree of satisfaction. It is of the utmost importance to the trade, that they use and recommend manufactures that are the products of a reliable concern, and thoroughly guaranteed to perform the work for which they are intended, and constructed on principles that are recognised as essential, in order to obtain the greatest power and efficiency with the least consumption of fuel." Despite the errors in punctuation which this extract contains, the advice is sound, though, prefacing as it does a trade catalogue, it would necessarily be taken with a good deal of suspicion. The Gurney Foundry Co., Limited, of Toronto, Canada (their London office is at Queen Street Chambers, 91, Queen Street, E.C.), are not contractors for erecting apparatus and their manufactures (which include hot-water heaters, steam boilers and radiators, stoves, ranges and hot-air furnaces) are sold only to the trade. Messrs. Gurney's "Doric" seamless tubular hot-water heaters are intended to meet the demand for an efficient, durable and economical heater for warming small buildings, and where large quantities of water require to be heated. It has a round fire-pot (for which the advantages of better combustion, greater economy of fuel, greater strength and avoidance of dead corners are claimed) which is made corrugated on the side next to the fire, thus increasing the heating surface, and connects with the dome or top by 2½in. tubes; the dome has cast on its inner side a series of ribs 1½in. deep and ⅜in. thick, which increase the direct heating surface and cause a more rapid circulation of the water. The heater is very neat in appearance and is warranted to be of the very best material and workmanship, any defective castings being replaced free of charge. It is made in numerous sizes. Messrs. Gurney also manufacture the "400 Series," "Oxford," "Bright Idea," "Defiance" and "Jacket" hot-water heaters, and the "Doric" and "Bright Idea" steam boilers. The latter portion of their catalogue deals with radiators of various kinds, ranges and stoves, some of which have a very good appearance.

New Companies.

Forest Brick and Tile Company, Limited.

This company was registered on November 16th by P. Le Brun, 50, Plough Road, Rotherhithe, S.E., with a capital of £15,000 in £1 shares, to carry on the business of brickmakers, merchants, and manufacturers of and dealers in iron, brick earth, gravel, clay, coal, &c.

Northern Wood Haskinizing Company, Limited.

This company was registered on November 6th by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £150,000 in £10 shares, to acquire, deal with, work, and turn to account in the counties of Northumberland, Durham, and York (including the Humber ports), certain patents relating to the treatment and preservation of wood, these said patents being the property of the Haskin Wood Vulcanising Company, Limited, and originally granted to G. H. Haskin, the inventor, or his agents, numbered respectively as follows:—3,875 of 1889, 23,866 of 1892, and 18,195 of 1897, and with a view to the above objects to adopt and carry into effect an agreement expressed to be made between the Haskin Wood Vulcanising Company, Limited and this company (by Thomas Harrison); to establish and maintain works for the treatment and preservation of wood, and to carry on the general business of timber merchants, sawmill proprietors; to buy, sell, prepare for market, manufacture, treat, import and export, and deal in and with timber of every description, and in all articles in which timber is used, &c. The first directors (of whom there shall be not less than three nor more than eight) are L. Wood, H. Bell, J. Dent, W. S. Vaugham, G. B. Hunter. Qualification, £1,000. Remuneration to be fixed by the company.

Selby Land Investment Co., Ltd.

This company was registered on November 22nd by Williamson, Hill and Co., 13, Sherborne Lane, E.C., with a capital of £10,000 in £1 shares, to acquire certain land and buildings on the north side of Cow Lane, Selby, Yorkshire, to adopt an agreement with T. S. Ullathorne, and to carry on the business of builders, contractors, decorators, timber and hardware merchants, &c. The first directors (to number not less than three nor more than six) are M. Scott, T. Liversidge, T, S. Ullathorne, T. G. Hawdon, and H. Connell. Qualification, 200 shares. Remuneration as fixed by the company.

Columbia Fireproofing Company, Limited.

This company was registered on November 22nd by Collins and Collins, 37, King William Street, E.C., with a capital of £42,000 in £10 shares, to acquire and deal with any patents and rights relating to fireproofing of floors, ceilings, partitions, &c.; and to acquire a certain invention from C. A. Ralph, of Pittsburgh, U.S.A. The first directors (to number not less than five nor more than seven) are C. A. Ralph, H. W. Berry, H. A. Bull, C. H. Sankey, J. Booth, J. F. Joyce, and J. D. O'Brien. Qualification £200. Remuneration as fixed by the company.

J. Siemers and Co., Limited.

This company was registered on November 23rd by A. E. Griffiths, 5, Bedford Row, W.C., with a capital of £4,000 in £1 shares, to acquire the business carried on at 21, Finsbury Pavement, E.C., as J. Siemers and Co., and to carry on the business of scaffolding contractors and patentees of life and labour-saving scaffolding. The first directors (to number not less than three nor more than five) are to be appointed by the subscribers.

British Challenge Glazing Co., Limited.

This company was registered on November 23rd by W. B. Palmer, 1, New Inn, W.C., with a capital of £10,000 in £1 shares, to adopt an agreement with J. P. Lena and T. G. Welch, to acquire the business carried on at 11, Bermondsey Street, E.C., as the British Challenge Glazing Company, Limited, and to carry on the business of glaziers, shopfitters, &c. Registered without articles of association. Registered office: 11, Bermondsey Street, S.C.

Hall Brothers' Timber Co., Limited.

This company was registered on November 24th by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £25,000 in £10 shares, to acquire the business lately carried on by John Hall (now deceased) and James Hall as Hall Brothers, and now by the said J. Hall solely, at Newcastle-on-Tyne Dock, Durham, to adopt an agreement with James Hall, and to carry on the business of timber merchants, timber growers, sawmill and creosoting works proprietors, &c. The first directors (to number not less than three nor more than five) are J. Hall, E. J. Hall, J. Robson and G. W. Bainbridge. Qualification, ten shares.

Port Soderick Developments, Limited.

This company was registered on November 24th, by Waterlow Brothers and Layton, Limited, Birchin Lane, E.C., with a capital of £5,000 in £1 shares, to adopt an agreement between John W. Haworth and this company, to acquire the Ballavere estate, Braddan, Isle of Man, and to carry on the business of builders, contractors, electric and general engineers, &c. The first directors (to number not less than three nor more than seven) are to be appointed by the subscribers. Qualification, £25.

COMING EVENTS.

Wednesday, December 6.

Institute of Sanitary Engineers.—Election Committee at 2.30 p.m. General Purposes Committee at 3.30 p.m.

Ruskin Society of Birmingham.—Rev. A. Jamson Smith, M.A., on "Ruskin as an Aid to the Lover of Art." 8 p.m.

Northern Architectural Association.—Council Meeting at 7 p.m., and Students' evening.

Society of Arts.—Mr. Joseph Cash on "Artificial Silk." 8 p.m.

British Archæological Association.—Meeting at 8 p.m.

Edinburgh Architectural Society.—Mr. William M. Page on "Notes on Art." 8 p.m.

Provident Institution of Builders' Foremen and Clerks of Works.—Ordinary Meeting of members at 8 p.m.

Thursday, December 7.

Royal College of Art, South Kensington.—Mr Arthur Thomson, M.A., M.B., on "The Anatomy Human Form: The Upper Limb."

Institution of Electrical Engineers.—Meeting at 8 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Carpenters' Company (Carpenters' Hall).—Sanitary Building Construction Examination: Paper work. 5 p.m.

Friday, December 8.

Glasgow and West of Scotland Technical College Architectural Craftsmen's Society.—Mr. D. Bennett Dobson on "Graphic Calculations." 8 p.m.

Birmingham Architectural Association.—Mr. C. R. Ashbee on "The Co-operative System among the Mediæval Builders in England." 6.45 p.m.

Institution of Mechanical Engineers.—Ordinary meeting. Nominations for annual election of officers. 8 p.m.

Institution of Civil Engineers.—Students' Visit to the Works of the Baker-street—Waterloo Railway, in course of construction, at 2.30 p.m.

Saturday, December 9.

North of England Institute of Mining and Mechanical Engineers. (Newcastle-upon-Tyne.)—Council meeting at 1 p.m. General meeting at 2 p.m.

Carpenters' Company (Carpenters' Hall).—Sanitary Building Construction Examination: Vivâ voce examination. 12 a.m.

Monday, December 11.

Philosophical Society of Glasgow (Architectural Section).—Mr. William Howatt, M.I., F.S.I., on "The Measurer and His Work." 8 p.m.

Society of Engineers.—Annual General Meeting at 7.30 p.m.

London Institution.—Mr. Francis Bond, Hon. A.R.I.B.A., on "Architecture and National Character." (Illustrated.) 5 p.m.

Surveyors' Institution.—Ordinary General Meeting at 8 p.m.

Society of Arts (Cantor Lectures).—Mr. Henry Hardinge Cunynghame on "Art Enamelling upon Metals."—IV. 8 p.m.

Victoria and Albert Museum.—Mr. Hugh Stannus, F.R.I.B.A., on "Historic Evolution of Applied Art: X.—Roman Pre-Christian Art." 6 p.m.

Tuesday, December 12.

Sheffield Society of Architects and Surveyors.—Professor T. Roger Smith, F.R.I.B.A., on "Oriental and Indian Architecture."

Wednesday, December 13.

Edinburgh Architectural Association.—Mr. F. W Deas, M.A., on "Notes on Eleventh Century Buildings in South-Eastern Italy." 8 p.m.

Sanitary Institute.—Council Meeting at 5 p.m.

Northern Architectural Association.—Mr. Frank Baker, F.G.S., on "Canterbury and Winchester Cathedrals." 7.30 p.m.

Institute of Sanitary Engineers.—Half-yearly general meeting for the election of officers for 1900, &c., at 4.30 p.m. Annual dinner at 7 p.m.

Birmingham and District Clerk of Works and Builders' Foreman's Association.—Mr. W. H. Bidlake, M.A., R.I.B.A., on "Building Construction of the Ancient Romans." 8 p.m.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 4 0
Sainfoin mixture	do.	3 15 0	4 5 0
Clover, best	do.	4 0 0	5 0 0
Beans	per qr.	1 6 3	—
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 3	1 6 10
Colza Oil, English ...	per cwt.	1 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 10 0	—
Linseed Oil	per cwt.	1 1 9	—
Petroleum, American ...	per gal.	0 0 7¾	0 0 7
Do., Russian ...	per gal.	0 0 6½	—
Pitch	per barrel	0 8 0	0 8 6
Tallow, Town	per cwt.	1 5 0	1 5 3
Tar, Stockholm	per barrel	1 5 6	1 6 0
Turpentine	per cwt.	1 16 9	—
Lead, white, ground, carbonate	per cwt.	1 3 0	1 4 0
Do. red	per cwt.	1 0 1½	—
Soda crystals	per ton	3 0 0	—
Shellac, orange	per cwt.	3 2 6	3 3 0

METALS.

Copper, sheet, strong ...	per ton	89 0 0	—
Iron, bar, Staffs. in London	do.	9 10 0	10 10 0
Do. Galvanised Corrugated sheet ...	do.	14 5 0	15 0 0
Lead, pig, Spanish ...	do.	17 12 6	—
Do. do. English common brands	do.	17 15 0	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	18 10 0	19 0 0
Do. pipe	do.	19 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	per ton	9 15 0	10 15 0
		£ s. d.	£ s. d.
Tin, Foreign	do.	125 10 0	—
Do. English ingots ...	do.	129 0 0	130 0 0
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	25 10 0	—
Do. Spelter	do.	19 17 6	20 0 0

TIMBER.

Soft Woods.

Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Do. Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg ...	per bundle.	0 1 4½	0 1 5
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd.	do.	12 10 0	12 15 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	15 5 0	17 5 0
Do. do. 2nd ,,	do.	10 10 0	12 0 0
Do. do. Unsorted ,,	do.	10 15 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	12 5 0	16 15 0
Do. White Sea	do.	13 10 0	17 5 0
Do. Quebec Pine, 1st...	do.	19 5 0	24 10 0
Do. do. 2nd	do.	13 15 0	15 15 0
Do. do. 3rd &c.	do.	9 10 0	—
Do. Canadian Spruce, 1st	per P. Std.	10 10 0	—
Do. do. 3rd & 2nd	do.	8 5 0	8 10 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	7 5 0	9 5 0
Flooring Boards, 1 in. prepared, 1st	per square	0 10 9	—
Do. 2nd...	do.	0 9 9	—
Do 3rd &c.	do.	0 8 6	—

Hard Woods.

Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4½	—
Do. Honduras	do.	0 0 4 5/16	—
Do. Tobasco	do.	0 0 4 7/16	—
Elm, Quebec	per load	12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 25/32	—
Do. African ...	do.	0 0 4 7/16	—
Do. St. Domingo ...	do.	0 0 5 11/16	—6 1/16
Do. Tobasco ...	do.	0 0 4 15/16	—
Do. Cuba ...	do.	0 0 6 7/8	—7 21/32
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	10 0	16 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 9	0 3 5

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

BISHOP'S WALTHAM (Hants).—For additions to the Crown Hotel. Messrs. Cancellor and Hill, architects, Winchester:—

Hale Bros....	£930	T. Rashley	£915
Pink	920	Whitehead	835

CARDIFF.—For the erection of new warehouses at the Bute Docks, Cardiff, for Messrs. Rose and Co., engineers. Mr. Edgar G. C. Down, architect and surveyor, 31, High-street, Cardiff:—

Ingleson	£1,952 0	Turner*	£1,798 0
Shepton	1,948 15	Lattey...	1,796 0
Evans	1,850 0	Perkins	1,750 0
Hallett	1,830 0	Knox and Wells ...	1,749 0

* Accepted.

EASTBOURNE.—Accepted for the execution of road works in thirteen roads, for the Corporation. Mr. R. M. Gloyne, C.E., Town Hall, Eastbourne:—

Dennis and Co., 134, Terminus-road, Eastbourne £3,189

KEITH (N.B.).—Accepted for additions to house, Rosehall, for Mr. Wm. Gordon, junior (of Yokohama). Mr. F. D. Robertson, architect, 92, Mid-street, Keith:—

Masonry.	
Robert Mitchell, Huntly	£566 0 0
Carpentry.	
G. and R. Cameron, Keith	460 0 0
Plastering.	
Wm. Menzies, Keith	112 12 0
Slating.	
Geo. Ogilvie, Elgin	98 13 0
Plumbing.	
John Wilson, Huntly	97 0 0
Painting and Glazing.	
Morrison McCormachie, Keith	68 3 7
	£1,402 8 7

Note.—Steel beams, ironmongery, and sanitary appliances are not included in the above sum.

LISCARD.—For the erection of church and school, Martin's-lane. Mr. F. W. Dixon, architect, Trevelyan-buildings, Manchester:—

T. Webster	£3,627	J. and G. Chappell ..	£2,956
W. Hall	3,162	Hughes and Stirling ...	2,954
Raffle and Campbell ...	3,050	R. Allen, Priory-st., Birkenhead*	2,795
Woohs and Son	3,010	H. Hardwick	2,641
Haugh and Pilling ...	3,000		
Peter Tyson	2,998		

* Accepted.

LONDON.—For improvements, &c., at Lant-street school, for the London School Board. Mr. T. J. Bailey, architect:—

Treasure and Son ...	£15,016	Killby and Gayford...	£13,762
Munday and Sons ...	14,486	Martin, Wells, and Co.	13,616
J. and M. Patrick ...	14,341	Stimpson and Co. ...	13,464
Lathey Bros.	14,277	Johnson and Co., Ltd.	13,427
Spencer, Santo, and Co., Ltd.	14,075	J. Marsland...	13,103
White and Co.	13,980	W. Downs*	12,847
Edwards and Medway	13,827		

* Accepted.

LONDON.—For removing boys' offices inside building, rebuilding offices, all departments, new washhouse, and office for schoolkeeper, refitting lavatories, new lavatories and offices for Art School, enlarging boys' playground, new boundary wall, and new drainage throughout at Saffron-hill School, for the London School Board. Mr. T. J. Bailey, architect:—

Lathey Bros.	£2,323 0 0	Edwards and Medway	£2,190 0 0
Killingback and Co.	2,309 13 5	Akers and Co. ...	2,112 1 10
G. Parker	2,298 0 0	E. Triggs*	2,067 0 0
Whitehead and Co., Ltd.	2,225 0 0		

*Accepted.

STONEHOUSE (Devon).—Accepted for the erection of a billiard-room at "Stone Hall," for Mr. J. Lockie. Edgar M. Leest, architect, Public Hall-chambers, Devonport:—

Carpenter, Mason, &c.	
W. J. Oliver, Devonport	£645
Girders.	
The Glengarnock Steel Co.	£24 16 9
Painting, &c.	
T. W. Earl, Devonport	(as per schedule)

CONTRACTS OPEN.

COUNTY BOROUGH of CROYDON.

ERECTION OF CLOCK TOWER.

Notice is hereby given that the Council are prepared to receive TENDERS for the ERECTION of a MASONRY CLOCK TOWER (about 25ft. in height) at Thornton Heath.

Plans, conditions, and specification may be seen at the Borough Engineer's Office, Town Hall, Croydon.

Tenders to be sent to me by ELEVEN o'clock in the forenoon on THURSDAY, DECEMBER 14th, 1899, endorsed "Tender for Clock Tower."

The Council will not be bound to accept the lowest or any Tender.

By order,
E. MAWDESLEY,
Town Clerk.

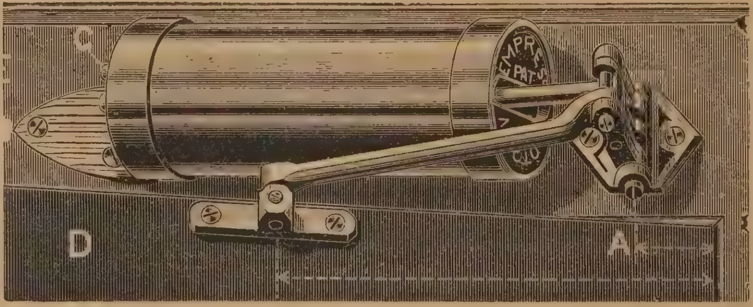
Town Hall, Croydon,
November, 1899.

WOOD-BLOCK PAVING.
(Mr. White's System.)
For Churches, Schools, Offices, &c.
Estimates and full particulars on application to
THOS. GREGORY & CO.,
Wood Paving and Steam Joinery Works,
Clapham Junction, S.W.

BOWER & FLORENCE,
Polished Granite Manufacturers,
ABERDEEN, N.B.
London Office: 64, FINSBURY PAVEMENT, E.C.
Quarries: PETERHEAD, N.B.

LIGHT & DARK SEA-GREEN STONE.
MOTTLED GREEN STONE
FOR
MULLIONS, SILLS, HEADS, QUOINS, JAMBS, FENDERS, &c.
Buttermere Green Slate and Stone Works,
KESWICK.

SPECIALITIES FOR THE BUILDING TRADES.
THE BEST OVERHEAD PNEUMATIC CHECK DOOR SPRING
THE "EMPRESS VICTOR"
ROBERT ADAMS (Pat.)



THE "EMPRESS VICTOR"
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DRAINAGE AND PLUMBERS' WORK.

By ISAAC YOUNG, Assoc.San.Inst.

A MEETING of the College of Masons took place on Tuesday, November 28th, at the Architectural Museum, Tufton Street, Westminster—Mr. J. Goodley in the chair—when Mr. Isaac Young, vice-chairman of the Sanitary Inspectors' Association and chief sanitary inspector to the Battersea Vestry, read a paper on "Some Details of Drainage and Plumbers' Work." He said:—The clay-jointed drain is no longer regarded as a suitable medium through which to pass sewage matter, nothing less than a water-tight construction being deemed sufficient for the protection of the health and lives of the public, and it is such a method of construction I have set myself to build up to-night. Assuming we have no choice in the selection of the site upon which our drain is to be constructed, and that there is no need to concern ourselves with the question of sub-soil drainage, the first point touched upon is that of levels. To enable this part of the subject to be properly dealt with, the depth of the sewer, whether of brick or pipe construction, should first be ascertained, and, secondly, the depth the drain will be below ground at its upper end. The distance between these points enables the question of fall to be determined. At the same time it must be borne in mind that too great a fall may give rise to trouble equally as much, perhaps, as too small a fall. The next point is the amount of work the drain may have to perform in a given time. In practice it is found that drains which are moderately flushed should not be laid to give a velocity of less than 3ft., nor more than 4½ft. per second. The following table shows the velocity and discharge from drains of the sizes most commonly in use:—

Diameter of Pipe.	Velocity, 3ft. per second.		Velocity, 4½ft. per second.	
Inches.	Fall.	Gallons per min.	Fall.	Gallons per min.
3	1 in 69	54	1 in 30·4	81
4	1 „ 92	96	1 „ 40·8	144
6	1 „ 138	216	1 „ 61·2	324
9	1 „ 207	495	1 „ 92	742·5

The drain must be of sufficient size to carry away, in addition to the liquid passing into it from the w.c.'s, baths, sinks, &c., the rain water from the roof, yards, &c., in connection with the building. I have stated we may have too great a fall; the following well-known gradients will, in practice, be found to give satisfactory results, and are easy to bear in mind:

3in. drains, fall of 1 in 30
4in. „ „ 1 „ 40
5in. „ „ 1 „ 50;

and so on. It will seldom be found necessary to construct any drain larger than a 9in., whilst a 4in. drain will be found sufficient for the greater percentage of dwelling-houses, &c.; 5in., 7in. and 8in. pipes have to be made specially when required in stoneware, but will be found to be very useful, as affording a gradual increase in the sizes of drains where numerous branches enter the main system. The method of calculating the diameter of the pipe required to carry off the sewage from these branches, is to draw a right angled triangle having its sides at the right angle proportionate to the diameters of the two pipes at their junction; the hypotenuse of the triangle gives the dimension required. Having dealt with the level and capacity of the drain, the next point to be considered is the

Materials

of which to construct it. It is generally admitted that all materials used in the construction of sewage drains, should be capable of preventing the percolation of the sewage into the surrounding ground. The pipes must be sufficiently strong to prevent their being fractured by pressure from the ground or other causes, both internal and external; and of such construction as not to be affected by the chemical action of the sewage, and perfectly smooth on their inner surfaces to prevent lodgment of the matter passing through. There are practically only two materials to our hand capable of performing these several functions, viz., iron and stoneware glazed pipes. Lead pipes for drains are sometimes used, but the dangers arising from the metal being converted into carbonate when the pipes are laid in contact with lime and moisture, are so great that I consider it very inadvisable to construct drains of this material. The old method of constructing brick drains for dwelling-houses is happily a work of the past, and I need not therefore further refer to it, except to say that on no account should they be so constructed, as it is practically impossible to make such drains water-tight; and, further, they are not so cleanly as those constructed of iron or vitrified ware. All drains, as far as practicable, should be outside the building. Where this, however, cannot be obtained, as in terraced houses, they should be constructed with

Iron Pipes.

No other form of drain should be permissible inside a building used—or likely to be used—for human habitation. Where iron drains are provided, it must be a *sine quâ non* that the pipes or other iron fittings shall be protected from oxidation. There are several ways in which this can be effected. One found to be effectual is known as the Bower-Barff process, the pipes in this case being subjected to superheated steam, with a hard coating of the black magnetic oxide. The iron pipe most commonly used is treated by what is known as Dr. Angus Smith's solution, which is a mixture of pitch, coal tar, resin and linseed oil. Iron pipes are also made with a porcelain enamel lining, but I have had very little experience of them, and cannot consequently speak as to their practical efficiency. It does, however, occur to me that the enamelling, beside being liable to damage during transit and laying, would be subject in actual use to alternate changes of hot and cold water, and that as the expansion and contraction of the enamel would not be in the same ratio as that of the metal, I am of opinion that after being in use for a time it would be found to crack and peel off, leaving the iron exposed to any chemical or other action which might be set up. I have found, from considerable experience, that pipes treated with Dr. Angus Smith's solution, and with properly caulked joints of molten lead, answer well. The joint should be first yarned, and this driven home to the back of the socket, or asbestos rings may be used. One other great advantage iron pipes have over stoneware is that the former, being made in 9ft. and 12ft. lengths, have only a fourth or sixth the number of joints stoneware pipes have, and as the joints may be regarded as the weakest part of the drain they should be as few in number as possible. Whilst speaking upon the jointing of iron drains, it may not be out of place to state that where very large quantities of hot water pass through drains, as is frequently the case in certain classes of buildings, there is a possibility that the

Joints made in Lead

will be found at times to become defective owing to the expansion and contraction of the pipes. All pipes used in iron drainage construction should therefore have the spigot-end somewhat enlarged, and a groove formed in the socketed end; this to a great extent prevents the slipping out of the lead. A further precaution is sometimes adopted by having the socket and spigot-ends made longer than those of the ordinary iron pipes, and the spigot-end also somewhat stouter than usual. The joint is made by means of asbestos rings only. Such a joint allows expansion and contraction to take place without injury to the joints. The making of joints to iron drains by means of molten lead has been taken exception to because of the voltaic action liable to be set up between these two metals; but if the pipes are at all times protected from oxidation, the lead is not in actual contact with the iron, and no fear need arise in our minds upon this question.

Iron drains must have good foundations, either by means of a bed of concrete throughout their entire length, or by piers built about 3ft. apart. It will be found an advantage not to concrete in the drain, or even to cover it with earth if this can be avoided. Iron channels can now be obtained, and these should always be used in connection with iron drains; they will be found to have one important advantage over those of the stoneware type in that they can be obtained with either bolted iron covers or a locking bar arrangement, which makes them both air and water tight, and also prevents the fouling of the chambers by the sewage passing through. I have dealt rather fully with iron drainage construction, because I feel that it will become in time more generally adopted when its advantages over the stoneware form of drain are properly recognised by architects and other professional men.

Stoneware Drainage.

I have not, so far, been favourably impressed with many of the patent jointed stoneware pipes upon the market, and do not, therefore, propose to enter into the merits or demerits of them, except in one instance. Most of these patent joints have a special form of construction upon their spigot end, and, as we know in practice, pipes have to be cut in varying lengths; the efficiency, if such there be, in most of the so-called improved form of pipe is destroyed by this act, and the joint has then to be made in the ordinary way. There is, however, one joint which, in my opinion, is worthy of mention, viz., the Strutt patent joint. The only difference in this pipe from those in ordinary use, is that the alteration is in the socket, and consists of a kind of rebate, into which the spigot end connects, thereby ensuring a true invert being formed in the line of drain, and further ensuring the joint being equally strong throughout, if properly made in cement in the usual way. All vitrified-ware pipes should be carefully selected. They should be perfectly straight from end to end, in cross section circular, well glazed internally and externally and the internal glazing especially very smooth, and the sockets square—not wedge shaped; with pipes of the latter description I have frequently found the joints, however well made, will not stand the water test, and any pipe not capable of this test should at once be discarded. It is found in practice, if the work is skilfully executed, that ordinary stoneware pipes answer all practical purposes, and leave nothing further to be desired in this method of drainage construction. No modern system of drainage can be considered complete without

Inspection-Chambers,

or manholes, as they are at times termed. The bricks used in these should be hard and close in texture, and rough on the surface. Good hard stocks are the most suitable for the purpose. I disapprove of building chambers in glazed brickwork, owing to the fact that the joints are exposed, and that the glazing is frequently found to flake off, either in laying or through the action of frost. It is difficult to make such chambers water-tight; that they should be so is as important as that the drains should be. Chambers built of stock bricks require to be internally rendered in cement, and before this is carried out the joints should be raked out to a depth of about $\frac{3}{8}$in. in order to afford a key for the cement rendering. Care should be exercised in doing this by trowelling the surface perfectly smooth, and not allowing the trowel to cut into the cement at the angles as is frequently done. Chambers should be provided at all important changes of line and gradient, and also in connection with the intercepting trap, of which I shall presently speak. The sizes of the chambers will be determined to a great extent by the work they have to perform and by their depth. They must, however, be of sufficient size for a person to enter for testing purposes or to use the drain rods in cases of stoppage. Chambers should not be built with lime mortar, but in sand and Portland cement. All tributary drains must be made to connect with the main drain obliquely in the direction of the flow, and as far as possible brought into the inspection-chambers. Channel bends and curves to suit all positions are made, and, with a fair assortment of these on the job, no difficulty will be experienced in selecting those most suitable for the purpose required. Channel bends should only be used in cases where the tributary drains must, on account of difficulties in fall, be connected at the invert. Three-quarter channel curves discharging into the main drain on the top edge of the main channel will be found to answer better in actual practice than bends of the half-pipe form. They should be carefully selected, as, like the pipes, they are liable to warp and become badly shaped in burning. Proper cement benchings must also be formed from both main channel pipes and bends.

Interception from the Main Sewer

should in all cases be provided, and great care in the selection of the trap for the purpose should be exercised. The outlet should be 3in. lower than the inlet; it should have not less than a 2in. water seal, and should not hold more water when at rest than is absolutely necessary. From the outlet side of the trap a raking arm for controlling the portion of drain on outgo of interceptor to the sewer should be provided. In fact, as is now the case with most of the better forms of traps, it should form part of it. The raking arm finishes at the inner face of the outer wall of the inspection chamber, and should have a moveable cap, preferably worked on the screw principle, or an interceptor can be used, with screw stoppers on inlet and outlet side. Such traps dispense with the usual channel bends. Some difference of opinion still exists as to the ultimate utility of the intercepting trap, many persons contending that the continued interception of house drains from the sewers will cause the latter to become a serious danger to the public health. To such I would say, it is not the duty of the house drain to ventilate the sewers of the sanitary authority, and that, as the provision of this trap is a safeguard to the occupants of the house, no objection should be offered to its use. Decomposing sewage generates dangerous gases which are rendered more dangerous when the sewage becomes mixed, as it does in town, with large quantities of hot water and waste of all kinds from chemical works, factories, breweries, tanneries, slaughterhouses, &c.; and, further, sewage appears to be a natural habitat for the development of germs of certain contagious diseases; it is upon these grounds that I advocate the use of interceptors. Let the owner of property protect the health of his tenants, and the sanitary authority the lives of the public generally, by ventilating the sewers vested in them directly into the atmosphere by means of plenty of open surface gratings and upcast shafts, and further by seeing that the sewers have such falls as to be self-cleansing, or, where the latter cannot be obtained to effect this, by providing automatic flushing chambers.

All chambers should be provided with iron air-tight covers. These should be galvanised, and, preferably, either of the locking or bolted type; in all such cases the locking arrangement or the bolts should be made of gun-metal. Wherever means will permit, an automatic flushing tank should be provided, discharging not less than twice per day, in the space of a few seconds, a body of water of not less than thirty gallons. Where, however, as in the majority of cases, the financial aspect is of great consideration, a little forethought in the planning of the house may be the means of more effectually flushing the system of drainage than generally obtains, as, for instance, by providing the bath-room, and, say, one of the closets at the head of the drain.

Ventilation of the House Drain.

Ventilation to all systems of drainage is a matter of considerable importance, and two shafts, at least, are necessary to accomplish this, the one being the inlet fixed near the intercepting trap, which, if well away from windows, &c., need not be provided with a mica valve, and the other pipe at the head of the drain, connected direct thereto and continued upwards, terminating in a domical wire top several feet above all windows. They should not be fixed to chimney stacks if this can possibly be avoided. It is frequently found in practice that the soil pipe to the w.c.'s above the ground floor can be utilised as the upcast drain ventilator, and is found in such cases to efficiently ventilate the same.

The Laying of the Drains.

In excavating, the ground should be first lined out from chamber to chamber, with the lines of drains between these points perfectly straight, so that whatever bends are necessary in the system of drainage shall be formed in the chambers only, as far as is practicable. The earth should then be removed to the depths required, the gradient of the bottom of the trench when finished being similar to the fall the drain will receive. Pegs should then be driven in about 10ft. apart to regulate the thickness of concrete, or, preferably, two bricks placed in front of the sockets and two immediately behind upon the bottom of the trench every 2ft. apart, and the under concrete then filled in to the level of the bricks or pegs. When the concrete has had time to partially set, the bricks in front of the sockets can be removed and the pipes laid in. By this method it will be found the pipes lay fairly on the bed of concrete from end to end, whilst the sockets will project into the holes left by the removal of the bricks, and will give sufficient room for the drain-layer to make his joints properly. When a fairly long length of pipes has been laid in position, a slight levering process from the upper end should be applied. This will force the pipes home into the sockets. A pailful of concrete laid on each side of the several pipes will keep them in position. The joints should then be proceeded with, beginning at the lower end. The operation should be performed twice, apart from the yarning; if yarn is used it should be untarred. The joints should be filled with cement and roughly finished, and after the topmost joint has been dealt with, the workmen should again begin at the lowest joint and trowel the same off to a smooth surface. After the joints have had time to set the pipes should be filled with water and allowed to stand at least two hours, when the concreting can be completed. I find it a good practice to leave the water in the drain whilst the side and top concreting is being carried out. Considerable care is necessary in carrying out this concreting, and also in filling in the upper earth. The several lengths of drain being laid in, and the chambers completed, a final testing of the work should in every case be made, both drains and chambers being charged with water, and allowed to remain so charged for three or four hours. The cement used for jointing must be well ground and thoroughly cooled. I discountenance altogether the system which largely prevails, of laying the pipes upon bricks and filling in the under concrete after the joints are made. It is in such cases I have frequently found, when testing drains finally, that the work has been defective, and when opened up to discover the cause, I have discovered that the pipes have not been laid fairly on the bed of concrete, and consequently have been fractured, or the joints broken, owing to the weight of earth above the drain. Drains passing beneath walls must either have an arch turned over the same, or a piece of York stone built in the wall to protect the drain in case of settlement. The practice of

Levelling each Pipe

is to be condemned; 6ft. to 10ft. tapering straight edges should be employed (the tapers being equal to the fall of the drain) for the purpose.

It would be impossible for me to enter fully into the advantages and disadvantages of the various forms of closet traps, &c., whose name is legion. The simpler the form of closet the better. Avoid those with complicated mechanism, and only use such as are constructed upon sound scientific principles. The simplest form of closet, and one of the most effective for mansion and cottage, is, in my opinion, the washdown, whether made as a pedestal, as pan and trap in one piece, or separately; if the latter, however, the joint between pan and trap should be below the water line. The pan should have as little superficial area as possible, and have a sloping front and nearly straight back. The flushing rim should be of such form that, whilst sufficient water is admitted to the pan to thoroughly cleanse the sides, the greater quantity should be admitted either at the back or front, to effectually remove the contents from pan and trap each time the apparatus is used. I only know of a very few

Valve Closets

that can be considered thoroughly efficient. In connection with this form of closet, there is always an overflow from the basin, and it should be observed that this is trapped at the outlet from basin, and connected into the valve box in such a position that the valve at the bottom of the basin opens back against the outlet of the overflow. In numerous valve closets the opposite will be found to be the case, and consequently the overflow of the basin is liable to be choked with filth upon the discharge of the closet. Valve closets may be supplied with water in two or three ways; if by a flushing cistern an after-flush arrangement is necessary to ensure the basin having a body of water in which to receive the fæcal matter; this may be said to be one of the principal advantages of a valve closet. It may also be supplied with water by means of a pull-away valve beneath the seat, the supply being given by lifting the handle attached to a bar; the after-flush in such a case is regulated by either a bellows regulator or other forms which cause the supply valve to close slowly. A third method is to supply the closet direct from a cistern above, the size of the flush pipe in such a case being determined by the head of water. It must, however, be borne in mind that if either of the two latter methods of supply be adopted, the cistern must not supply water to any fittings likely to be used for drinking or potable purposes, otherwise the water may be contaminated and cause serious illness. Wash-down closets should at all times be supplied by syphonic action flushing cisterns, with 1¼in. to 1½in. flush-pipes. In some of the better forms of wash-down closets an enlarged pool of water is provided at the bottom of the basin for the purpose of more effectually immersing the fæces during use, and preventing the fouling of the sides of the pan. No closet should have a less flush than two and a half to three gallons. The majority of the water companies' regulations do not permit this quantity, only allowing a two-gallon cistern to be used. It is to be hoped that they will be compelled before long to yield to this most necessary alteration, especially in the smaller classes of property, as in such the flush of water from the w.c. constitutes the principal flushing medium for the drainage system. All traps should be of the syphon principle, and without angles as far as practicable, including those used in connection with the drains.

Soil Pipes

may be either of lead or of iron. The former being malleable, it can readily be adapted in the hands of the skilful plumber to the various positions required in the construction of the soil pipe, and, being made in 10ft. lengths, the number of joints is few. These joints may be of the ordinary wiped form, or of a more ornamental character, where such are desired, in the form of astragal joints. Iron pipes are now made which answer well for soil pipes, the joints being made in molten lead, in the same manner as for iron drains. The pipes and other fittings must be protected from oxidation, either in the manner before mentioned or by galvanising. Specially made junctions, inverted and otherwise, can now be obtained, and will, if the work is well carried out, be found to answer very effectually. All iron waste, soil and vent pipes are best fixed clear of the buildings. The wastes of slop sinks and urinals must be constructed in a similar manner to soil pipes, as the filth deposited is similar to that deposited in a water-closet. All soil-pipes should be directly connected with the drain (having no traps in it except that at the outgo of the w.c.) and continued upwards for the purpose of ventilation. I would remark here that the primary object in ventilation is not, as many believe, to effect the removal of gases caused by decomposing sewage matter, so much as to prevent their development by causing fresh air to enter the drain and waste pipes of every description. Next to this, of course, the ventilation is provided to relieve the compressed air and to prevent the syphoning out of the water seals of the traps by the passage of water through the pipes, for when this takes place the house is left open for the drain air to escape into. All soil-pipes should therefore be continued upwards their full diameter and made to terminate above the roof clear of windows, chimneys and other openings in the roof, and also well away from cisterns. The top should be protected in a similar manner to drain ventilating pipes. The longer the vertical length of soil-pipe the quicker will be the velocity of the water passing through, and air must enter the vent pipe at the same rate, otherwise the water seal of the trap will be broken. This brings me to a point I wish particularly to draw attention to, namely, that in very long ventilating pipes the air does not enter as quickly as is necessary to preserve

The Water-seal of the Trap,

consequently a portion of air will pass through the trap, pushing out the water contained in it to gain access to the partial vacuum in the soil-pipe; and if we therefore imagine for a moment that the ventilating pipe was so long that the friction in it caused the air to travel so slowly as to render it useless for preventing trap syphonage, it would, in such a case, be found necessary to make the ventilating pipe considerably larger than the soil-pipe. It will be found that bends in a ventilating pipe materially retard the passage of air through it, and these should never be fixed if they can possibly be avoided; neither should cowls be fixed at the top of ventilating pipes for the same reason. If a pail of water is poured down the topmost of three water-closets situated on the first, second, and third floors on a stack of soil pipes, the contents passes into the vertical pipe and drives the air before it, compressing it into a smaller space than it originally occupied in the part of pipe between the upper and middle closets, before the air in the next part of the pipe is set in motion. The effect of this is that the water rises on the inlet side about $\frac{3}{8}$in, and in less than a second afterwards the lower trap is similarly affected by the extra pressure from the air inside the vertical pipe, but after the water from the upper closet has passed the middle branch soil-pipe a reverse action of the air occurs. Air entering the top of the vent-pipe is slightly retarded in its progress through the pipe, owing to friction against its sides; the air becomes, consequently, rarified, and in attempting to keep its original bulk, takes off a part of the press on the outlet side of the trap, so that, it will be seen, the water in the trap is first pushed from the soil-pipe and then drawn into it, causing the water seal of trap to be reduced. This evil effect of bad ventilation can be avoided by connecting an anti-syphon pipe with the branch pipe at the outgo of the trap. This has a threefold use, first by preventing the soil-pipe acting as the longer leg of a syphon, pulling the water out of the traps; secondly, by relieving the compressed air during the time the water is passing down the vertical soil-pipe; and, thirdly, by preventing the accumulation of carbonic acid gas in the branch soil-pipes, the effect of which is daily seen in old, unventilated soil-pipes and D traps, in which it will be found the metal has been converted into carbonate. In practice it is usually found that 2in. pipes are sufficiently large to prevent syphonage, &c., except in the case of very high buildings, and that a 4in. soil-pipe is sufficient for a stack of seven or eight w.c.'s. If, however, more than three w.c.'s connect into the soil-pipe it would be wise to provide the main anti-syphon pipe $2\frac{1}{2}$in. or 3in. in diameter, or reduce the size of the branch soil-pipes to each closet-trap to 3in. or $3\frac{1}{2}$in. The actual position where the anti-syphon pipe is to be connected in the branch pipe is provided for in the Metropolis by the by-laws of the London County Council, made under Section 39 (1) of the Public Health (London) Act of 1891, which prescribes that it shall be connected at a point not less than 3in. or more than 12in. from the outgo of the trap, and this may be taken as a fair guide generally. On no account must such pipes be connected at the top of the trap, although it would appear, theoretically, this is the proper position, but in practice it is found, where pipes have been so fixed, they become in a very short time partially or entirely choked by soil, &c., being forced into them on the discharge of the closets, &c.

Having been thanked for his lecture by Mr. G. H. Jones, hon. sec. of the College, and Mr. Goodley, Mr. Young, in reply, wished the College continued success in its endeavours to bring about the revival of the old guilds of masonry. He understood it was not a trade union, which fact would undoubtedly ensure its prosperity.

Surveying and Sanitary Notes.

Mr. W. R. Crabtree, chief district surveyor at Sheffield, has been appointed highway surveyor to the Doncaster Rural District Council.

The Guiseley Sewage Works.—At the monthly meeting of the Guiseley District Council on Wednesday evening, Mr. Johnson, engineer, submitted estimates of the cost of carrying out the improvements at the sewage works required by the Local Government Board before they would sanction the loan of £5,500 already asked for. The engineer estimated the cost of the additional works at £1,120, and it was resolved to make application for sanction to borrow £1,200 in addition to the £5,500 previously asked for.

Glasgow's Unclean Streets.—Great dissatisfaction is expressed in some quarters at the manner in which the streets of Glasgow are cleaned, and at the last meeting of the Town Council the minutes of the Cleansing Committee were referred back. It is, perhaps, of interest at this juncture to quote from a parody in "Punch":—

> Paris is clean, why not St. Mungo, then,
> And every street within the Second City?
> We have no lack of water, brooms—or men
> Eager for any labour, more's the pity!
> Turn all hands on to sweep and scrape and squirt
> Our dreary, weary town of Dreadful Dirt!

Subways to City Cables.—The City Corporation intend to apply for Parliamentary powers to construct conduits for electric lighting, telegraphic and telephonic cables.

A Building Accident Claim.—On June 19th last a man named John Baker was working on some new houses at Normanton, and whilst standing on a wall was knocked down by a batten, which, it was alleged, another workman named Gibson had passed to him negligently. His collar-bone was fractured, and he died soon afterwards. On Tuesday in last week, at the Wakefield County Court, the legal representatives of Baker sued Gibson, and received damages for £50.

A Peculiar Fatality.—A remarkable case of death from electric shock was investigated by the Bradford City Coroner last week. Deceased was Edgar Driver, nineteen, electrician, who, in repairing an arc lamp, accidentally touched a wire and was killed. Expert evidence showed that the shock was only 225 volts, whilst the current was not generally fatal under 1,000 volts, and men had survived a much more severe shock than this. There were latent dangers in electricity not yet fully realised. A verdict of "Accidental death" was returned.

STRENGTH OF CONCRETE SLABS.

A JOINT committee of representatives of the Northern Architectural Association, the Newcastle, Gateshead and Tyne District Master Builders' Association, and the Council of the Building Trades' Exchange, was appointed last March to organise and carry out an independent test of the comparative breaking strengths of concrete slabs made with and without the addition of "expanded metal." The details were left in the hands of a sub-committee, under whose personal direction and supervision twelve slabs were set up on wood centerings and brick piers in the foundry yard of the Gallowgate Iron Works, belonging to Henry Walker and Sons, Limited, on July 20th and 24th last, the centerings being removed on August 16th. The slabs, which were calculated within a fraction of the cost per yard either way, were cast in wooden boxes supported by brick piers, and the concrete was mixed according to the specification of the sub-committee as follows: "Concrete to be gauged 5 to 1 for the 5in. slabs and 3 to 1 for the 3in., and the cement to be of the ordinary gauge of 2,500 meshes to the square inch. The concrete for the 5in. slabs to be composed of four parts clean washed gravel to pass a 2in. gauge, one part of clean sand and one of Portland cement. The concrete for the 3in. slabs to be composed of two parts clean washed gravel to 1in. gauge, one of clean sand and one of Portland cement."

The cement was procured from a merchant in the ordinary way, and when tested there was *no* residue through the 50 sieve, and only two per cent. through the 70 sieve. It, however, only weighed 94lbs. per striked bushel.

The 5in. slabs at 5 to 1 with metal were Nos. 2, 5 and 8, and those without the metal Nos. 1, 3 and 4, being 8in. thick, the extra 3in. being necessary to equal the value of the metal (No. 10 gauge). The 3in. slabs at 3 to 1 with No. 8 metal were Nos. 9, 10 and 11, and those without the metal were increased to $4\frac{1}{2}$in. thick to equal the value of the metal omitted and were Nos. 6, 7 and 12. Each slab had 6in. wall hold, each end only supported. The corresponding slabs, with and without metal, were made out of the same gauging of concrete. All were 4ft. wide.

In the presence of several members of the committee and a number of other gentlemen, the slabs were gradually weighted with pig iron on September 19th and 20th last, and in their report the committee state the results to have been as follows:—

Slab No. 1 broke before the test began, two men and six pigs of cast iron being on it—*i.e.*, about 9cwt. No. 2 broke under a load of 237cwt. 3qrs. 14lbs., showing $\frac{1}{8}$in. deflection under 75cwt., $\frac{1}{2}$in. deflection under 175cwt.; it cracked at 220cwt. No. 3 broke under a load of 22cwt. 2qrs. 18lbs. No. 5 was unbroken under a load of 340cwt. 1qr. 21lbs., though it showed $\frac{5}{16}$in. deflection: it was unsafe to pile the pig iron to a greater height. When the load was taken off the slab went back to nearly its original straightness. No. 4 broke under a load of 124cwt. 2qrs. 20lbs. No. 8 was unbroken at 270cwt. 2qrs. 2lbs., at which point the piling of pig iron was considered unsafe, being about 11ft. high. The slab showed a slight deflection under a load of 261cwt. 2qrs. 12lbs., but went back again.

It should be mentioned that the slabs, when cast, remained exposed in the open to a continuous hot sun which had "spiders webbed" the surface of the cement. No. 4 slab was partly protected from the sun.

Slab No. 6 broke accidentally while the men were piling up the weight on No. 5. No. 10 broke under 96cwt. 1qr. 17lbs. No. 7 broke under 17cwt. 1qr. 25lbs. No. 11 broke under 113cwt. 0qrs. 22lbs. No. 12 broke under 10cwt. 3qrs. 10lbs. No. 9 broke under 213cwt. 3qrs. 8lbs.

Generally speaking there was only slight deflection before breaking. The fracture of the expanded metal was clean and free from crystalline appearance, the strands of steel having come closer together under the load, the "diamonds" being considerably elongated.

Masters and Men.

Masons Locked Out at Hawick.—Messrs. Bell and Turnbull were fined £10 by the Operative Masons' Union for employing a "black" firm in Hawick to do work at a job at Boncaster. The payment of the fine was refused, on the ground that the job was beyond the five miles' limit. In consequence of this dispute nearly all the masters in the town have locked out their men.

Barry Carpenters and Joiners.—Dr. Neale presided at the annual dinner of the Barry branch of the Carpenters' and Joiners' Society, held last week. A large company attended, including Mr. D. Richards, Southport, a member of the Executive Council; Mr. C. Halford, secretary to the General Union; Councillor Paterson; and others. Mr. J. Lace, secretary of the local branch, responding to the toast of the "A.S.C.T.," referred to the progress made locally, where they possessed a membership of 121, the income for the past nine months being £225 and the expenditure £108. During the year there had been paid in sick and relief claims £44 6s., and only £2 15s. as out-of-work money.

The Iron and Steel Trade.—The price of manufactured iron in bars, plates, rails and angles, as returned to the Northern Conciliation Board, Middlesbrough shows the nett selling price for September and October at £6 11s. 6d.—the highest rate for nearly ten years—making a further advance of 4s. 6d.; ironworkers' wages by the Sliding Scale advance 2½ per cent., in addition to the previous advance this year of 10 per cent. The return for September and October to the Midland Iron and Steel Wages Board, Birmingham, gives the average price at £7 12s. 10d., no less than 8s. 6d. above the average of the two preceding months; this allows of an advance of 2½ per cent. in wages, the increase on the year being 12½ per cent. Steps were being taken to apply the Midland sliding scale to a number of the sheet works of South Wales. It is proposed to form a local committee in that district to be affiliated with the Midland board. The threatened difficulties in the Scotch steel trade have been satisfactorily adjusted; at a private meeting last Thursday of the Conciliation Board for the Manufactured Steel Trade of Scotland, it was agreed to advance wages 5 per cent. from December 3; and the men, who asked for 10 per cent., have accepted the offer.

An Unsuccessful Claim against Builders.—An action, under the Workmen's Compensation Act, was recently brought before Judge Templar at the Darlington County Court, in which Michael Flannery and Mary Flannery claimed £78 damages for the loss of their son, John Flannery from John Guthrie and Son, builders, of Darlington, by whom he was employed at the time of the accident. He was employed by the defendant on a new building in Darlington, and had several times previously descended from the top of the building by a rope, because he came down quicker, but had been warned by the foreman not to do so, as it was dangerous. On August 31st last, in descending in this way, he met with an accident, and died the following day. For the plaintiffs it was urged that the action came within the scope of the Employers' Liability Act, as there was machinery, including a pug mill, pulleys, &c. For the defence it was contended that there was a staircase which Flannery should have used, and that the accident was due to the man's wilful misconduct. After hearing the evidence, His Honour dismissed the application with costs, on the ground that it was not within the course of the man's employment to come down the rope, and that he was guilty of wilful misconduct in doing so; and further, that the father and mother were not dependant upon him for the necessaries of life.

Builders' Notes.

London County Council.—At the meeting held on November 28th, after considerable discussion, the recommendation of the Finance Committee with regard to the new asylum at Horton was adopted. This approved the excess expenditure of £117,000, but suggested that the facts should be sent to the General Purposes Committee for investigation and report. In defence of the expenditure, Mr. Hubbard (chairman of the Asylums Committee) said that when the Council appropriated £350,000 for the asylum they were told that the building could not be erected for that sum. The detailed estimate given was but a rough one. For instance, the foundations were estimated to cost £31,000, but the lowest tender received was £52,000. For the superstructure the architect's estimate was £281,400, but when the manager of the Works Department was asked for his price he fixed it at £284,400. Tenders were then invited, and it was found that the lowest was for £296,575, and the highest for £299,900. After negotiations the work was given to the Works Department. It was, therefore, easily seen why much of the expenditure was in excess of the estimate.

London Improvements.—During the next Parliamentary session H.M. Commissioners of Works and Public Buildings will apply for powers to acquire land to the south of Lincoln's Inn Fields for the purpose of extending the existing buildings of the Land Registry and other public offices. The Postmaster-General proposes to acquire numerous properties for the service of the post office, including land and premises in Upper Street for a new Northern District Post Office, in Whitechapel Road for the extension of the post office, in Union Street, Southwark, for a new parcel office, and at Brockley for a new sorting office. The London County Council have their Bill for the Thames Embankment extension and Westminster scheme; they also propose numerous street widenings in various districts. In their General Powers Bill the Council ask for powers for the compulsory purchase of land for fire brigade stations, for rehousing in connection with the Clare Market scheme or the new street from Holborn to the Strand, for the purposes of the Technical Instruction Acts, for open spaces and recreation grounds, and to enable burial authorities to provide crematoria; two Bills refer to tramway extensions. The London County Council also intend to ask leave to bring in measures enabling them to purchase or acquire by compulsion or agreement Spitalfields Market, for the construction of a Thames tunnel between Ratcliff and Rotherhithe, with the necessary approaches, and to have conferred upon them the same or similar powers of acquiring land for street improvements as may now be exercised by vestries and district boards in the county. They will reintroduce their measures to bring a supply of water from Wales and to acquire the undertakings of the London companies; and the East London Company propose to ask for powers to make new storage reservoirs, aqueducts, &c. Notice is also given of a measure giving power to the Local Government Board to require the metropolitan water companies to submit schemes for further storage reservoirs in the Thames Valley, and power to the companies to take further waters from the Thames and its tributaries. The South Metropolitan Gas Company proposes to transfer that portion of the undertaking of the Gas Light and Coke Company which is situate on the south side of the Thames in the administrative county to the South Metropolitan Company, on terms that may be agreed between the two companies. The L.C.C. notify their intention of bringing in a Bill to amend the Acts relating to the Gas Light and Coke, Commercial Gas, and South Metropolitan Gas Companies in respect of gas testing, to provide for fixing, prescribing and limiting the charges to be made, and, among other things, to require the companies to issue to consumers statements with regard to the sum charged and the method in which this sum is made up.

Engineering Notes.

Railway Carriage Lighting.—It has been decided to light all the carriages on the London, Chatham and Dover Railway by electricity.

Atherton and Manchester Water Supply.—A Local Government Board inquiry has been held into the application of the local authorities to borrow £1,500 for works of water supply.

Artesian Wells.—At the meeting of the Leiston Rural District Council on Wednesday it was unanimously resolved to provide two more artesian wells at Sawston, and a tender was also accepted for sinking a third well, provided a suitable site could be found.

A new electric ventilator has recently been invented by Mr. R. Mackay, jun., of Glasgow, which claims to have none of the disadvantages inseparable from the use of gas or fire. It is made by Messrs. Cousland and Mackay, ventilating engineers, Glasgow.

Burnley Tramway Scheme.—The Corporation propose to promote a Bill for relaying the Burnley and district tramway, which will come into their possession next year, for providing electrical equipment, and for carrying branch lines into various parts of the town. It is stated that the probable cost of reconstruction and making the proposed extensions will cost about £150,000.

A breakwater formed of natural cement at Marquette (America) has proved a great success, and it is calculated that it will be in good serviceable condition a hundred years hence. Twelve years is the average life of the old wooden-cribbed breakwater filled in with stone. When the work was begun seven years ago many engineers doubted if the natural cement could be used in place of Portland, but experience has proved that, mixed with a small quantity of the latter, it is admirable, so much so, in fact, that the Government has undertaken a much larger work of the same kind at Duluth.

Municipalisation of Cambridge Waterworks.—At a meeting of the Cambridge Town Council some time ago it was resolved by a majority to acquire the University and town waterworks, but it was afterwards ascertained that the majority was not sufficient to satisfy the requirements of the Act of Parliament. The matter was referred to the Council's parliamentary agents, who advised that the vote should be taken again, and a special meeting was accordingly held last week when the vote was carried by twenty-five to seventeen.

Hoylake Water Supply.—The ceremony of starting the new engine for the pumping of water to supply the districts of Hoylake and West Kirby took place on Saturday. Since 1878, when the original works were commenced by the Hoylake and West Kirby Gas and Water Company Limited, the continued growth of the district has necessitated the sinking of new wells and the provision of more powerful machinery for pumping purposes. In 1878 the machinery then employed was capable of lifting 20,000 gallons of water per hour, whereas the new machinery, with the aid of the existing machinery, is capable of pumping 100,000 gallons per hour, or nearly 2,500,000 gallons per day, and this is likely to be adequate for the requirements of the district for some time to come. The directors, in order to keep the works in the highest possible state of efficiency, are now applying for powers to enable them to construct another reservoir capable of holding two million gallons of water, a water tower 66ft. in height, and also to sink another bore hole from the bottom of No. 2 well to any required depth. In their new departure the company have acted upon the advice of their engineers, Messrs. Beloe and Priest, 13, Harrington Street, Liverpool.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—		
Dec. 8	Aberystwyth, Wales—Four Houses	D. Howell	T. E. Morgan, 12, Baker-street, Aberystwyth.
,, 8	Londonderry—Eleven Dwelling Houses	T. C. Wylie	R. E. Buchanan, Architect, Castle-street, Londonderry.
,, 8	Stotfield, Scotland—Rebuilding Golf Clubhouse	....	A. and W. Reid and Wittet, Architects, Elgin.
,, 9	Spean Bridge, Scotland—Two Villas	....	L. and J. Falconer, Architects, Fort William.
,, 9	Hither Green, S.E.—Sunday School and Manse	Bible Christian Church Trustees	E. J. Hamilton, Architect, 2, New-road, Brighton.
,, 11	Bacup, Lancs.—Bridge Works	County Council	County Bridgemaster, County Offices, Preston.
,, 11	Lochgelly, Scotland—Tenements	Co-operative Society, Ltd.	J. Murray, 233, High-street, Keighley.
,, 11	Settle—Offices, &c., in Town Hall Buildings	....	H. Ross, Architect, Cannon-street, Accrington.
,, 11	Wavertree, near Liverpool—Buildings	....	E. Kirby, 5, Cook-street, Liverpool.
,, 11	Edmonton—Superstructure of Three Cottages	Urban District Council	G. E. Eachus, Engineer, Town Hall, Lower Edmonton, N.
,, 11	Liverpool—Cottage Home School, &c.	Vestry	E. Kirby, 5, Cook-street, Liverpool.
,, 11	Manchester—Reconstructing Houses	Paving, &c., Committee	City Surveyor, Town Hall, Manchester.
,, 11	Rotherham—Retaining and Fence Wall, &c.	Rural District Council	R. Bradbury, 29, High-street, Rotherham.
,, 12	Belfast—Buildings	Ocean, Accident & Guarantee Corpn. Ld.	W. H. Stephens and Son, Donegall-square North, Belfast.
,, 12	Sligo—Alterations, &c., to Infirmary	....	W. T. Vernon, Secretary, Courthouse, Sligo.
,, 13	Leyton, Essex—Infirmary	West Ham Union Guardians	F. E. Hilleary, Clerk, Offices, Union-road, Leytonstone, E.
,, 13	Bangor, Ireland—Residence	Dr. Gorman	J. V. Brennan, Architect, Belfast Bank-chambers, Belfast.
,, 14	Huddersfield—Livery Stables	B. Oxley and Sons, Limited	J. Kirk and Sons, Architects, Huddersfield.
,, 14	Southerndown, Glamorgan—Hotel	W. Powell	G. F. Lambert, Architect, Bridgend.
,, 14	Brighton—Underground Urinal	Corporation	F. J. C. May, Borough Surveyor, Town Hall, Brighton.
,, 14	Croydon—Masonry Clock Tower	Corporation	Borough Engineer, Town Hall, Croydon.
,, 14	Wigan—College	Technical College	Briggs and Wolstenholme, Architects, Richmond-terrace, Blackburn.
,, 15	South Kensington—Foundations, &c., to Victoria and Albert Museum.	Commissioners of H.M. Works and Public Buildings.	Sir John Taylor, H.M. Office of Works, &c., Storey's-gate, London, S.W.
,, 15	South Kensington—Foundations, &c., to Royal College of Science.	Commissioners of H.M. Works and Public Buildings.	Sir John Taylor, H.M. Office of Works, &c., Storey's-gate, London, S.W.
,, 15	Whitley, Northumberland—Council Offices	Urban District Council	J. P. Spencer, 13, Grainger-street West, Newcastle-on-Tyne.
,, 16	Brydekirk, Scotland—Additions, &c., to Public School	....	— Irving, Clerk to Board, Kirtlebridge.
,, 16	Shirebrook, near Mansfield—Lock-up	Standing Joint Committee	J. S. Story, Surveyor. County Offices, St. Mary's-gate, Derby.
,, 16	Abingdon-on-Thames—Hospital	Joint Hospital Board	J. G. T. West, Architect, Abingdon.
,, 18	Fleetwood, Lancs.—Schools	School Board	W. H. Haworth, 15, Mawdsley-street, Bolton.
,, 18	Isle of Thanet—Infectious Diseases Hospital	Joint Hospital Board	Franklin and Andrews, 25, Ludgate-hill, E.C.
,, 18	Romford—Laundry at Workhouse	Board of Guardians	R. L. Curtis, 119 and 120, London Wall, E.C.
,, 18	Willesborough Lees—Hospital Building	East Ashford Rural District Council	H. Hamilton, Clerk, 11, Bank-street, Ashford. Kent.
,, 19	Barking, Essex—Ejector Station, &c.	Urban District Council	C. J. Dawson, Surveyor to Council, Public Offices, Barking.
,, 19	Blaen Llynvi, near Tywith, Glamorgan—Station	Great Western Railway Company	Engineer, Newport Station.
,, 19	Burnley—Extension of Goods Yard, Offices, &c.	Lancashire and Yorkshire Railway Co.	W. B. Worthington, Engineer, Hunt's Bank, Manchester.
,, 19	Birkenhead—School Extension	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
	ENGINEERING—		
Dec. 8	West Ham—Electric Lighting Plant	Town Council	Borough Electrical Engineer, Abbey Mills, West Ham.
,, 8	Dundee—Steam Fire Engine, &c.	Town Council	Sir T. Thornton, Town Clerk, City Chambers, Dundee.
,, 9	Edinburgh—Girder Roof	Corporation Gas Commissioners	W. R. Herring, Chief Engineer, Gasworks, Edinburgh.
,, 11	Woking—Steam Alternators	Electric Supply Company, Limited	Preece and Cardew, 13, Queen Anne's-gate, Westminster, S.W.
,, 11	Bacup, Lancs.—Bridge Works	County Council	County Bridge Master, County Offices, Preston.
,, 11	Jarrow—Steel Foot Bridge	....	J. Petree, Borough Engineer, Jarrow.
,, 11	Manchester—Alterations, &c., at Sewage Works	Rivers Committee	Secretary, Rivers Department, Town Hall, Manchester.
,, 12	Birkenhead—Overhead Travelling Crane, Mains, &c.	Corporation	W. Bates, Borough Electrical Engineer, Birkenhead.
,, 12	Dover—Water Mains	Town Council	H. E. Stilgoe, Borough Engineer, Town Hall, Dover.
,, 12	Ilford—Pumps, &c.	Urban District Council	J. Taylor, Sons, & Crimp, 27, Gt. George-st., Westminster.
,, 12	Worcester—Storm Water Conduit	Corporation	T. Caink, City Engineer, Guildhall, Worcester.
,, 12	London, S.W.—Hydraulic Machinery, &c.	London County Council	Engineer's Department, County Hall, Spring-gardens, S.W.
,, 12	London, N.E.—Refuse Destructors	Hackney Vestry	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 13	Rushden. Northants—Sinking Well	Urban District Council	J. Eunson, Engineer to Council, Northampton.
,, 15	Blackpool—Electrical Plant	Corporation	R. C. Quin, Corporation Electricity Works, Blackpool.
,, 15	Lincoln—Gas Manufacturing Plant	Gas Committee	J. Carter, Manager, Gas Offices, Lincoln.
,, 15	Langport—Reservoir, Pumping Station, &c.	Rural District Council	Bailey, Denton, Son and Lawford, Palace-chambers, 9, Bridge-street, Westminster.
,, 18	London, E.C.—Electrical Plant	Midland Electrical Corporation for Power Distribution, Limited	G. Carpenter, 11, Cornhill, E.C.
,, 20	Birmingham—Steaming Pumping Engines & Pumps, &c.	Corporation	J. Mansergh, 5, Victoria-street, Westminster.
	IRON AND STEEL—		
Dec. 8	Blackburn—Cast-iron Urinals	Highway Committee	W. Stubbs, Borough Engineer, Blackburn.
,, 9	Leicester—Stores	Corporation	E. G. Mawbey, Borough Engineer, Town Hall, Leicester.
,, 11	Ilford—Pipes	Gas Company	J. Denney, Secretary, Ilford.
,, 11	Glasgow—Railway Stores	Caledonian Railway Co.	J. Lorimer, Stores Sup., Charles-st., St. Rollox, Glasgow.
,, 11	Birmingham—Stores	Kynoch, Limited	Secretary, Kynoch, Limited, Witton, Birmingham.
,, 13	Stockton-on-Tees—Stores and Materials	Tees Conservancy Commissioners	Engineer to Commissioner, Stockton-on-Tees.
,, 13	Dublin—Stores	Port and Docks Board	N. Proud, Sec., Port & Dock Office, Westmoreland-st. Dublin.
,, 16	Manchester—Tie-bars, Bolts and Nuts	Tramways Committee	J. M. M'Elroy, Secretary, Tramways Department, Town Hall, Manchester.
,, 18	Margate—Stores	....	F. Stanley, Waterworks Office, Municipal-buildings, Margate.
	ROADS AND CARTAGE—		
Dec. 9	Leicester—Granite	Corporation	Borough Surveyor, Town Hall, Leicester.
,, 9	Ball's Bridge. co. Dublin—Stores	Pembroke Urban District Council	J. C. Manly, Clerk, Town Hall, Ball's Bridge.
,, 9	Worcester—Horse Hire, &c.	Corporation	T. Caink, City Engineer, Guildhall, Worcester.
,, 11	London, N.—Road Works	Finchley Urban District Council	C. Roberts, Bibbsworth House, Church End, Finchley, N.
,, 11	Cottingham, near Hull—Making-up Roads	Urban District Council	J. H. Hanson, Surveyor, Market-green, Cottingham.
,, 11	Guildford—Road	Town Council	C. G. Mason, Borough Surveyor, Tuns-gate, Guildford.
,, 11	Jarrow—Road Works	Corporation	J. Petree, Borough Engineer, Jarrow.
,, 12	Cleethorpes, Grimsby—Road Works	Urban District Council	E. Rushton, Surveyor, Poplar-road, Cleethorpes.
,, 14	Wallingford—Roads, &c.	Rural District Council	G. F. Slade, Clerk, Wallingford.
,, 14	Nottingham—Stores and Materials	Corporation	A. Brown, City Engineer, Guildhall, Nottingham.
,, 17	Saddleworth, near Oldham—Materials	Rural District Council	J. Bradbury, Clerk, Union Offices, Upper Mill, nr. Oldham.
,, 19	West End, near Southampton—Kerbing	South Stoneham Rural District Council	J. Cudlipp, District Surveyor, Old Netley, Hound.
	SANITARY—		
Dec. 8	Meltham—Sewers	Urban District Council	J. B. Abbey and Son, 34A, New-street, Huddersfield.
,, 9	Cheltenham—Sewerage Works	Corporation	Borough Surveyor, Municipal Offices, Cheltenham.
,, 11	Fulwood, Preston, Lancs.—Sewers, &c.	Urban District Council	W. Taylor, Engineer, Council Offices, Fulwood, Preston.
,, 11	Worsley, Lancs.—Sewer	Urban District Council	J. T. Profitt, Surveyor, District Offices, Wallsden.
,, 11	Maldon, Essex—Scavenging	Rural District Council	M. C. Warne, Inspector of Nuisances, Southminster.
,, 12	Bedlington—Sewerage Works, &c.	Urban District Council	C. Brown, Bedlington.
,, 13	Croydon—Sewering	Rural District Council	R. M. Chart, Surveyor, Union Bank-chambers, Croydon.
,, 14	London, S.E.—Drainage Works, &c., at Infirmary	St. Olave's Union Guardians	Newman and Newman, 31, Tooley-st., London Bridge, S.E.
,, 18	Westbury-on-Trym—Removal of Ashes	Barton Regis Rural District Council	H. T. H. Lancaster, Clerk, Barton Regis, Eastville, Bristol.
,, 19	King's Lynn—Stores	Corporation	H. J. Weaver, Borough Surveyor, King's Lynn.
,, 23	Sonning, near Reading—Sewering	Wokingham Rural District Council	J. F. Sargeant, 8, Shute-end, Wokingham.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Dec. 15	Lymm—Council Chamber and Offices	£25, £15	W. Mullard, Clerk to Urban District Council, Lymm.
Jan. 31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.
Mar. 12	Belfast—Assembly Hall	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast.
No Date	Harrogate—Northern Police Covalescent Home	....	Hon. Secretary, St. Georges, Harrogate.

Property and Land Sales.

FREEHOLD BUILDING LAND to be LET on LEASE, or SOLD in PLOTS; fronting on main road, and close to golf links and Highgate Woods; near Muswell Hill and East Finchley Stations. Liberal advances if required to responsible Builders.—For plans and particulars apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington Road, N. 9

REID'S BREWERY, Clerkenwell-road.—Further sale of the materials of this extensive pile of buildings.

MESSRS HORNE and CO. (in conjunction with Messrs. CHINNOCK, GALSWORTHY, and CHINNOCK) are instructed to SELL by AUCTION, in Lots, on the PREMISES, on Tuesday, December 19th, at Half-Past Twelve o'clock Precisely, the BUILDING MATERIALS of a very large Block, including Nos. 3, 10, and Middle Stores, extensive ranges of Malt and Hop Lofts, and Nos. 2 and 3, Ponto and Tun Rooms, including sound stock brickwork, excellent slates, timber, roofs and floors, heavy baulk girders and uprights, w. i. fireproof and other folding and sliding doors, c. i. tank, 24ft. by 33ft. by 3ft. 3in. flange and socket pipe, turned shafting, friction hoists, steel conveyors, several hundred tons of cast and wrought iron in useful girders and columns of various descriptions, granite paving, pitching, many tons of lead, also a quantity of loose brewery utensils, brads, screws, bolts, nuts, scaffolding, ladders, deals, firewood, &c. May be viewed on and after December 14th.

Catalogues had of Messrs. HORNE and Co., 8, Delahay-street, S.W., and 85, Gresham-street, E.C.

FINE SITE FOR WORKS.

FOR SALE, about 10 Acres of FREEHOLD LAND, with good road frontage, and adjoining the London and North-Western Railway Station, in an improving Midland town and colliery district; canal close to; good labour market.—Apply to GEORGE LOVEITT and SON, Estate Agents, Coventry.

SOUTH KENSINGTON.—Important Freehold Building Site, specially suitable for the erection of residential flats, and occupying an area of about 18,500 superficial feet.

By direction of the Executors of the late Captain Nisbet, deceased.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY and CO. will SELL by AUCTION, at the Mart, E.C., on THURSDAY, DECEMBER 14th, 1899, at TWO o'clock precisely, the valuable FREEHOLD old-fashioned RESIDENCE and GROUNDS, known as "Hollywood Lodge," Hollywood-road, having a frontage thereto of 104ft., and a return frontage of 173ft. to Fawcett-street, and occupying a commanding corner position, about half-a-mile from Earl's-court and South Kensington Railway Stations, and close to the Fulham-road, and in direct communication with the West End and City omnibus route. With possession.

May be viewed, and particulars, plan, and conditions of sale obtained of Messrs. SANDILANDS and Co, Solicitors, 12, Fenchurch-avenue, Fenchurch-street, E.C.; at the Mart, E.C.; and of Messrs. FAREBROTHER, ELLIS and Co., 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

SALE DAYS for the Year 1899.

Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, Dec. 7 | Thursday, Dec. 14

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

HARROW-ON-THE-HILL.—Three acres of eligible Lands abutting on main road, laid out for small villa or cottage residences, five minutes from town and schools and proposed railway station, TO BE LET on Building Lease, or FREEHOLD will be sold. —For terms and particulars apply to BENTWICH WATKIN WILLIAMS and GRAY, Solicitors, Corporation-chambers, Guildhall-yard, E.C.

STREATHAM.—Norfolk House Estate.—Important and valuable Freehold Property, with possession, containing about 15 acres and 24 perches, with frontages to main roads, and offering unequalled advantages for development as a building estate. By order of the Trustees under the will of the late Christopher T. Gabriel, Esq.

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THE AUTHORITY OF

"SPECIFICATION."

Extract from the Correspondence Column of the "Building World," Sept. 2nd, 1899:—

[2877] YORKSHIRE SLATES.—J. D. (*Ilkley*) writes:—"Please explain, in the form of a specification, how a roof should be slated with Yorkshire slates. Should the lap be more than 4in.? and how are the edges dressed for a first-class job?"

— A general specification of good slating will be given in the solution to question 64 in the Honours Building Construction, which will shortly appear in "Building World." Yorkshire slates, or grey slating, is the name given to the thin flags or tile-stones, or stone slates, largely used for roof coverings in the northern counties. They are generally from ½in. to 1in. thick, and hung to the battens by wooden pegs about 3in. long, and laid close. Owing to their weight they require heavier rafters or spars, but they are very efficient in maintaining the rooms below at an equable temperature. The clauses relating to such a roof are given in **Specification** as follows: "Cover the roofs coloured . . . on plan with . . . stone tiles, best quality, laid to a 3in. lap at 45° pitch, with diminished courses from eaves to ridge, a double course at eaves, and dressed to hips, valleys, and verges, properly bonded in every part, and shouldered up in lime and hair mortar. The tiles to be fixed with oak pegs on to 1½in. by ½in. sawn oak laths spiked to rafters. Perform all cutting and labour. The verges to be bedded and pointed in cement. The valleys to be formed with stone tiles worked to an angle. The hips and ridges to be formed out of solid sawn stone, 9in. wide on each splay, in lengths of not less than 3ft., bedded and jointed in cement, with solid-cut junction pieces. The lowest hip stones to have strong wrought-iron stays."—HENRY ADAMS.

SPECIFICATION No. 4 is still on sale at all Booksellers and the Railway Bookstalls, Price 5s. nett, or from the Publisher, 5s. 6d. post free.

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS

December 13, 1899.
No. CCLIII.

Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

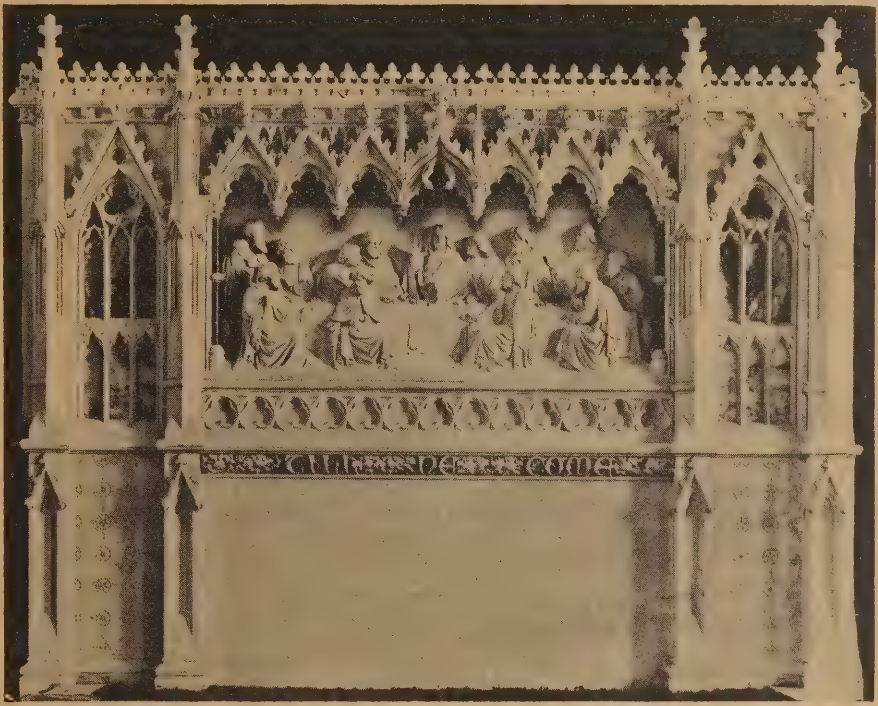
The Sheep of Architecture.

Surely architects are in their habits the most conservative of men. Two hundred years ago it became an established rule that no architect was fully educated in his art who had not been to Italy and seen St. Peter's and the Pantheon, and this notion we have accepted without question, though very many things, some of them as I think material to the matter in hand, have happened in the meantime. Because Inigo Jones and the great classical architects who succeeded him all advocated Italian study, we must do the same. Now it has always seemed to me a strange thing that we should go on thus unreflectingly in the steps of our predecessors. A tour in Italy is truly one of the most delightful experiences a man can have; there are mountains and valleys, lakes and rivers, pictures and statues, sunny skies and ancient cities; but why should the enjoyment of these good things be thought of peculiar service to architects? It is not to them particularly, but to men of all professions that a visit to Italy is an education.

Of course, you can understand well enough that Inigo Jones and Wren could not be happy without going to Rome and studying that class of buildings which had, up to their time, been produced in their completeness only in Italy. Being convinced that the high Renaissance style was the one to adopt, they naturally desired to visit a land where that style had been most completely developed; and seeing that they recognised this style to be derived from another one—that of ancient Rome—they wished to see the models after which the style they admired had been formed. And, accordingly, when they reached Italy, their attention was chiefly directed, I take it, on the one hand to the remains of ancient Rome, the Coliseum, the Pantheon, and so on; and on the other to the works of Vignola and Palladio, or of Michelangelo and the other architects of St. Peter's. They were always in search of the grandiose, or of the elegant, and orders and entablatures, cornices and attics, domes and porticos, were the objects of their interest. But seriously, how much do modern architects care about the grandiose and the elegant? Municipal bodies, truly, will have the grandiose if they can; but, after all, most of us travel to see what is pleasing to ourselves, not to our clients, whether actual or prospective. Consequently, when we go to Italy we usually find, in my opinion, that the works which aroused enthusiasm in Inigo Jones, or Wren, awake in us but a languid interest. I rarely meet anyone who says that he receives real pleasure from the contemplation of St. Peter's, and as to Palladio's St. Giorgio at Venice, its effect, save from a distance sufficient to obliterate most of its features, is depressing in the extreme. What we go to Italy for nowadays is the work of the early Renaissance; the Cancelleria at Rome, or the great Florentine palaces, or the tombs in Sta. Maria del Popolo—the South Kensington style, in short. There are some who, using the eyes of Ruskin, see the perfection of architecture in Italian Gothic. Of this work—both the early Renaissance and the Gothic—we feel that it is genuine; that is to say, its originators felt and enjoyed its beauty; while of the later buildings, St. Peter's or St. Giorgio, we half feel that they are made to impress the public with the designer's skill, or learning, or sublimity, and instead of being easy, natural and unpretentious, they are aggressive and unsympathetic. In fact, a great change has come over the view which appreciative people take of architecture in Italy. At the present time, before admiring any work, we make a condition—rightly, as I think—that the work must show the author's delight in it. He may not have achieved his ideal, but it must be evident that the effect he was striving for was one which gave him a direct sensation of pleasure; otherwise, we put him down as a poser, a rhetorician in art. But Inigo Jones and Wren were not so particular on this point. Their art is imposing rather than sympathetic, so that it is inevitable that we should fix our interest on objects to which they gave but little attention.

The old notion, therefore, that it is essential for all architects to go to Italy wants overhauling; Wren and Jones believed it because they found there certain buildings which they wished to examine and imitate. We do not want to imitate these buildings any longer, so why should we follow one another to Italy like a flock of sheep? Truly there are many beautiful buildings in Italy besides those of the high Renaissance; but are they just the works that we want to study? Personally, I fancy the early Renaissance work too refined and too exquisite to be of much use to us with our climate, our materials, and our tastes; and the Italian Gothic strikes me as something a little awkward and brutal. Many persons will no doubt disagree; let them, being certain of what they like, go to Italy and study it. But it should not be taken for granted that architecture is at its best in Italy; let us think for ourselves and realise clearly what gives us pleasure and what does not, without deferring to the authority of Inigo Jones, or Wren, or Ruskin; even degenerate moderns like ourselves have a right to our own judgment and an obligation to use it.

E. B. S. S.



Photographed by S Applegarth.

REREDOS IN THE CHURCH OF ST. BARNABAS, CLAPHAM COMMON, S.W. W. AND C. A. BASSETT-SMITH, ARCHITECTS. THOMAS RUDGE, SCULPTOR.

Reredos at St. Barnabas Church.

The elaborately carved reredos illustrated on this page has been erected in the new church of St. Barnabas, Clapham Common, London, S.W., recently opened by the Bishop of Rochester The reredos is of Caen stone, inlaid with polished alabaster panels, and is of the early decorated style. The portion representing the "Lord's Supper" is carved out of one solid piece of stone, the weight being over one ton as finished. The work was executed by Mr. Thomas Rudge, sculptor, of Webbs Road, Clapham Common, S.W., from designs submitted by the architects, Messrs. W. and C. A. Bassett-Smith. Mr. Rudge had all the carvings of the church entrusted to him. Our illustration is from a photograph by Mr. S. Applegarth, of 119, Lavender Hill, S.W.

Chimneys, Great and Small. LONDONERS who value their great waterway, the Thames, and appreciate its architectural possibilities, have noticed of late a large increase in the number of chimneys on the Surrey side of the river; tall and short, square and round, some bearing advertisements and all adding their quota of smoke to the murky air of London. From various causes they are increasing in other parts of the city, often in the most unexpected places, cleaving the air beside a church spire or towering up a few yards behind a fashionable street; in short, they enter into all views of London to an extent which was unknown a few years ago. The ordinary house chimney is, of course, to be seen in tens of thousands, and its effect is to mar the skyline of many buildings, giving a ragged, confused look. In a country where open coal grates are universal, or very nearly so, the chimney, one would think, should be treated as an honoured feature of every design; yet how little is it actually considered! It is unfortunate that Mr. Ruskin should, many years since, have lent the weight of his name to a theory that chimneys, being purely utilitarian, must necessarily be ugly. This is on a par with his bitter objection to any attempt at softening the harshness of a railway station; it is "the very temple of discomfort," he says, therefore let it remain so. But such a theory is opposed to the whole history of architecture, where, in every age, beauty and use have gone hand in hand, and in none more than the fifteenth, sixteenth and seventeenth centuries in England, when our domestic buildings were at their best. In those centuries, more especially in the sixteenth, chimneys were prominent and beautiful features of most designs, generally in clusters, carefully planned to turn their angles to the spectator, their long stalks sometimes ornamented, ending in spreading tops. It is to the eighteenth century that we owe the decay of this useful and picturesque feature and the growth of "chimney-pots." In modern times our architects have struggled as well as popular ignorance and public niggardliness would allow to revive the rational treatment of the chimney question. Two excellent modern examples may be mentioned: one in the City, the National Provident Institution at the corner of Gracechurch and Bishopgate Streets, the other in the West End, to wit Grosvenor Gardens. Both are notable, too, as showing that the system is not necessarily confined to Tudor or Elizabethan. The tall factory or commercial chimney at first sight might seem unsuited to artistic design, but it is not so, and one illustration proves it. Looking across the Thames the most satisfactory object on the further bank is the old Shot Tower, a favourite subject with artists; though not itself a chimney, it serves to show that a plain structure in the form of a chimney in simple brick can yet be effective and pleasant to the eye if only its proportions be good and the outline diminish gradually to the top. Upon that outline all depends, and how small a thing is it to require a modicum of taste in this. Isolated as all but the lowest part of a great chimney is, and very narrow for its height, it presents some difficulties to the designer, but Europe is full of beautiful examples of high tapering structures whose outline might serve to some extent as a model in such cases; the older campaniles of northern Italy at once suggest themselves, and the light tapering minarets of Eastern countries; both are very often found in the simplest materials, and with very little detail.

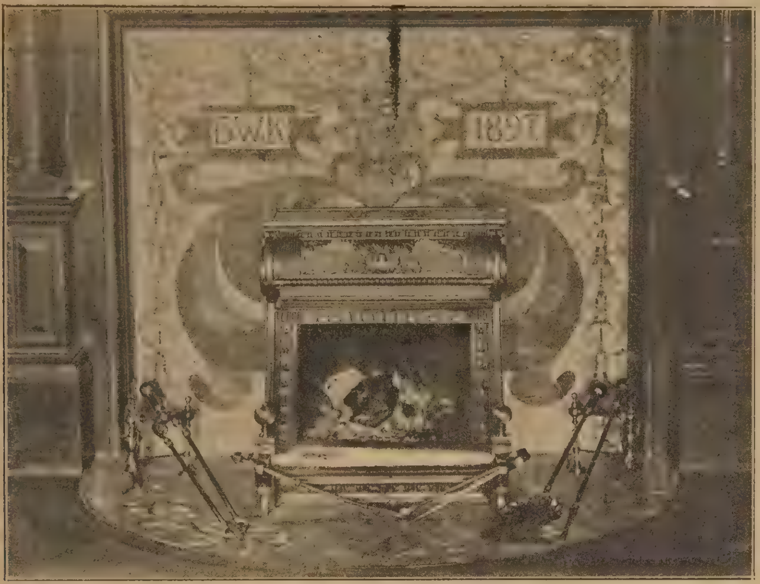
J. C. P.

On Reflection.

Lighting Reforms. Two matters relating to artificial illumination which need reforming are the design of street lamps and the lighting of shop windows. Speaking generally, the question of street lamps is confined rather to those using gas, as the electric standards come under the newer influences and are very often of highly meritorious design. The gas lamp has more often than not a crude and harsh appearance. Not only is the cast-iron standard itself either too heavy or pinched in with the idea of ornamenting it, but the lamp seems to be the production of the unenlightened shopman animated by no other purpose than the duplicating of an accepted form with the greatest profit to himself. As an example of what can be done in this branch of design, the lamps on the Victoria Embankment may be mentioned, for not only are they emblematic of their surroundings, but the design is a sturdy one, having a good broad base and tapering gracefully to the globe. It would, of course, be absurd to demand that all street lamps should be equally good, for the cost of making the Embankment lamps was greatly in excess of what ordinary corporations would be prepared to pay for their own lamps; but still the reference serves its purpose—to draw attention to the urgent need of better design in this direction. While speaking of street lamps it might be well to refer to those cut-glass monstrosities which seem to be the special outside feature of the modern public-house. Their cost is high, but they never enhance the appearance of the street they overhang. With regard to the illumination of shop windows, it should be remarked that "point" lighting ought not to be aimed at (though in nine cases out of ten it is), for it is not the lights, but the goods that require to be seen. The truth of this remark will be forcibly brought home by comparing a jeweller's shop window that has electric lights stuck here and there around it in full view and one in which the light streams softly down from the top, augmented, it may be, by shaded lights at the front. Clear points of light are needed in some places, but not in shop windows, and the objection becomes increased ten-fold when an electric arc lamp is introduced, producing what is perhaps the most objectionable of all effects in shop lighting. Diffusion should be the object, for we feel certain that in the next century the prevalent custom of "point" lighting will be replaced by one in which a universal glow and softened radiance will be the two most prominent qualities.

A German View of Ruskin. WE said the other day in these columns that it was interesting to know what one nation thought of the works of another, and an article by a competent German art critic on Mr. Ruskin's influence and views, published in the current number of the Berlin "Nation," may be cited in this connection. The criticism is more interesting from the fact that until quite recently Ruskin's works could not be obtained in the German language, and, consequently, he was comparatively little known in Germany. The note which the critic sounds tends chiefly to point to our great prophet as a moralist who "clothed his moral teaching in the garb of æsthetics," and though the validity of his theory might be open to doubt, his influence has been strong and far-reaching. Ruskin is, however, called inconsistent or illogical in his naturalism, for on the principle that true art is worship he would have only the good in nature selected and imitated, and would make everything subordinate to a very strenuous theory of morals. This is where the German critic's allegation of inconsistency comes in, and he regards as narrow prejudices Ruskin's dislike for the nude in art and preference for landscape, prejudices which he ascribes to an English birth and training. But he admires Ruskin's enthusiasm, his love for nature, and his wonderful powers of expression, and points out the difference between his art teachings and those of Tolstoi. The Russian Count said, with the idea of reducing the argument to an absurdity, that if his friend were right even wall-papers might be works of art. Ruskin, of course, would gladly admit that possibility, and rightly so, for no one who has any knowledge of paper-hangings and their possibilities would deny that they could be works of art. William Morris himself—Ruskin's "truest friend and disciple," as the critic puts it—"became a designer and manufacturer of wall-papers, and we owe it to him that nowadays simple middle-class houses have walls more beautifully decorated, almost, than those of king's palaces used to be."

A Bad Case of Vandalism. THE Cathedral of Milan has one façade, dating from the sixteenth and seventeenth centuries, which has been declared by some to be out of accord with the rest of the building, and, therefore, offending. A worthy citizen of Milan who held this opinion died in 1884 and bequeathed about four hundred thousand lire towards the building of a new façade, but he attached the proviso that the work should be commenced within twenty years of his death. A competition was held, in which architects from all parts took part, but it proved unsatisfactory and, as the result of a second competition, the designs of a young Italian architect named G. Brentamo were accepted in 1888. It appears that an attempt was made to begin the work at once, but the architect died suddenly and this upset matters to such an extent that nothing has been done since, and as there only remain a few years of the stipulated limit of twenty, the cathedral authorities are beginning to feel anxious about their restoration, especially as it has been found that the legacy will not nearly cover the expenditure entailed. The artists of Milan, supported by many of the newspapers, are all against having the old façade touched, which, out of keeping or not, is a fine piece of work. This view of the case has no more zealous supporter than the eminent architect Signor G. Beltrami. He says:—"This great monument, which occupied many centuries in building, bears the stamps of various ages, shows traces of all the generations which in succession bestowed their labour on it. Each epoch has contributed its share, for good or ill, until our Duomo has become, so to speak, the visible record of the arts throughout the centuries. Unpardonable, therefore, would it be to lay a desecrating hand upon it, or to attempt to modify it with the object of arriving at that unity of style which it cannot possibly possess. Moreover, as the façade now exists, so we have always seen it, so we have learned to love it, with all its beauties, all its faults. Time has laid a colouring hand upon its stones, and clothed them with that mysterious harmony which no human skill can replace or imitate, should this contemplated crime ever be committed." Presuming this to be a fair view of the case, we certainly agree that the substitution of a new façade would be a gross act of vandalism, and in this age of "restorations" the cry of "hands off" the old buildings needs to be taken to heart by all concerned, for too often the hand that touches mars and withdraws for ever the charm and beauty which Time alone can give.



FIREBACK AND HEARTH AT "BENNETTHORP," EALING. DESIGNED AND WORKED BY G. BRIDGE. A. SYKES, A.R.I.B.A., ARCHITECT.

MOSAIC.

DESIGN AND WORK.

By GEORGE BRIDGE.

(Concluded from page 160, No. CCXLV.)

THE best position for a mosaic upon a wall, internal or external, is where it can be granted the largest amount of space consonant with the design of the building: although, however large the mosaic, it must of course be treated as a subordinate part of the architectural scheme. Indeed, in buildings where mosaic is not confined to certain spaces enclosed by architectural constructional features, but is allowed to spread over pilasters, ribs and mouldings, the general effect is cheap and tawdry. Mosaic looks richer in colour and more sumptuous as a decoration when it is framed by the naked building material of which the structural portions of the edifice are composed, be it marble, stone, or brick.

The mosaic worker must make the general colour of his mosaic subservient to the colour of the building, of which it is only a part; it is ridiculous to alter or design the building to the mosaic. The roof of the choir in St. Paul's Cathedral has a very tinselly effect. The indistinct mosaic designs have gold mosaic backgrounds, and all the surrounding architectural features have been covered with gold leaf, the whole forming a general mix-up of smudges of colour and tawdry gold.

Designers for mosaic very often make the great mistake when colouring their sketches that gold mosaic is the only background for their design, whether it be figures or ornament; it is a very easy way of getting over the difficulty of thinking out a fuller colour scheme to make a sketch and to write gold background upon it. The material is more expensive than the ordinary mosaic material, and it may be more satisfying to the client to have a little design and plenty of gold about his building, but much richer effects can be obtained by using appropriately coloured backgrounds, and only using all lustre materials (golds, silvers, rubies, &c.) where they will help a figure, like jewels, clasps, &c., upon draperies.

Mosaic has almost always been looked upon as quite unfitted for the external decoration of buildings in London and other large English cities; the primary reason for this studied neglect is stated to be that the chemical action of certain atmospheres—the smoke and the soot—tends to obliterate the colours of the material. The same reasoning might be applied to all carvings in marble or stone; the material will not keep to the original startling white after a few months of London atmosphere.

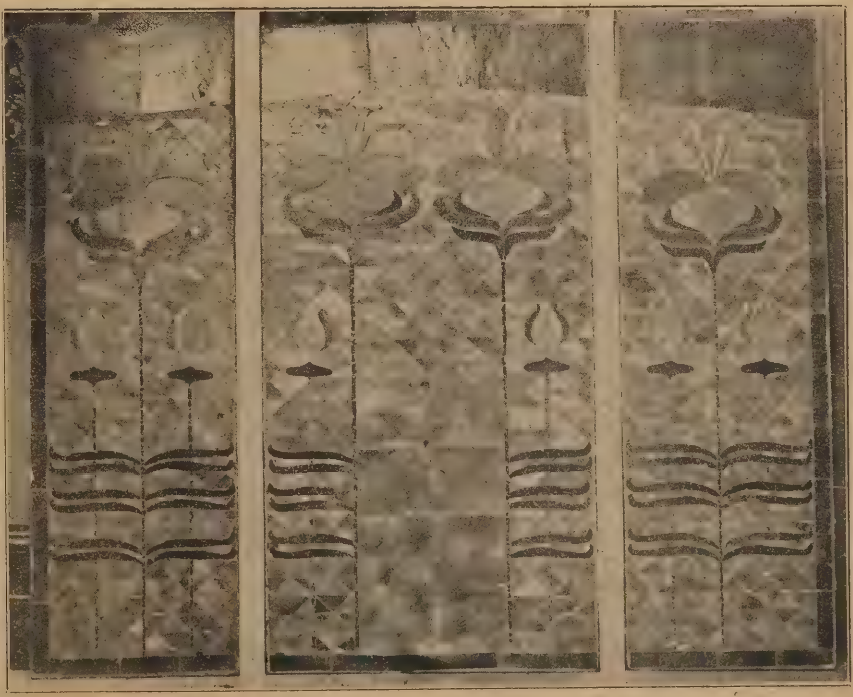
If mosaic were only given more trials as external colour decorations, and the designer and worker were given an absolutely free hand as to the strength of colour used, it would be found that if the colour when applied showed a slight tendency to crudeness, whatever dirt was deposited would simply rectify the crudeness and soften and sweeten the whole mosaic.

There are not overwhelming evidences of dirt upon the mosaics in the Albert Memorial, and they have been exposed to the London dirt for something over thirty years. In London mosaic has seldom been given a chance to display its full powers externally or internally; an architect is generally loath to grant but small patches of space upon his building to the mosaic worker; these are generally sketched showing thin curly wire-like ornament upon them, and the finished work in position can show none of the chief characteristics of mosaic. The panel might just as well be filled with a slab of granite for any special colour effect gained. The space granted for work of this description should certainly be large enough to allow the designer plenty of scope to design his mosaic in large decided masses of colour, big in general treatment and in detail. The drawing also should be very strong and marked in the design, and of course the higher the position of the mosaic the more decided and emphasized must be the drawing, colouring and details of anatomy, drapery and ornament; indeed these must be insisted upon and slightly exaggerated to suit position. The outlines should be squarer and more sharp and angular the higher the position, as if the drawing has only the normal outline the drawing will appear very weak, the distance tending to enfeeble all detail in a decoration.

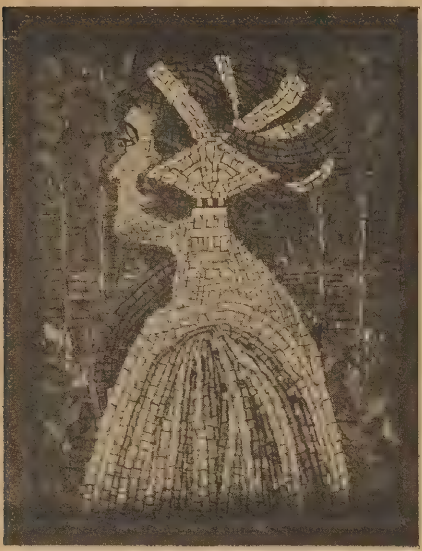
As to design for mosaic, it is not sufficient to take a design for some other material, such as stained glass, and think that it will be good enough for mosaic. The drawing must be thought out and worked up to suit the material. Neither will it satisfy the end in view to drape a model and make a coloured drawing of it, and, after placing a nimbus round the head, to label it with the name of some saint. To paint a picture and deliver it to the workman with instructions to copy it shows a great want of knowledge upon the part of the draghtsman. The man who can only paint pictures is not the one to be entrusted with the commission to draw for any of the applied arts—picture painting is only one of the means to the end in designing for decoration.

The artist should be a designer and decorator to be competent to work out a scheme for any such permanent material as mosaic. Any weakness of drawing would be emphasized in the work, and it would become an everlasting monument to inability, and a standing epitaph to misapplied material. Surely the more durable the material to be used to form a decoration the greater should be the artist employed to execute it.

It is curious to contrast the ignorance of the laws governing decorative design displayed by the majority of modern artists who have drawn for such a permanent material as mosaic with the great knowledge in evidence daily shown by artists who produce such perishable productions as posters. The former have not troubled to learn anything of the craft they are working for; the latter produce masterpieces in the narrowest of limits as to design and reproduction. A first-rate poster designer is very nearly akin to the mosaic artist. They both should gain their object by the simplest means. The poster designer limits the number of blocks to be used, and



FIREBACK AND CHEEKS AT "TANGLEWOOD," GODSTONE. DESIGNED AND WORKED BY G. BRIDGE. C. W. MARSHALL, A.R.I.B.A., ARCHITECT.



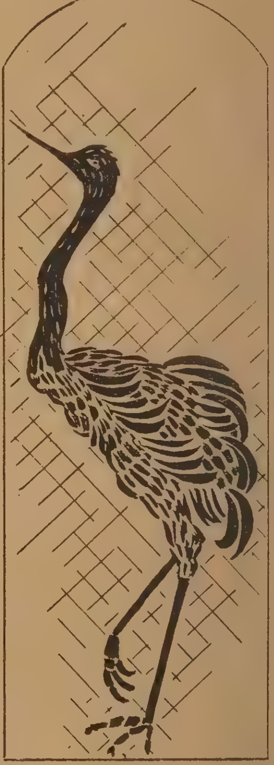
DECORATIVE PANEL AT THE "HAYMARKET" THEATRE, LONDON. DESIGNED AND WORKED BY G. BRIDGE.

the mosaic worker limits the number of colours. The main idea should convey its meaning in a direct and distinct manner—standing from the background—in both arts, and the whole composition should be as decorative as the subject will allow.

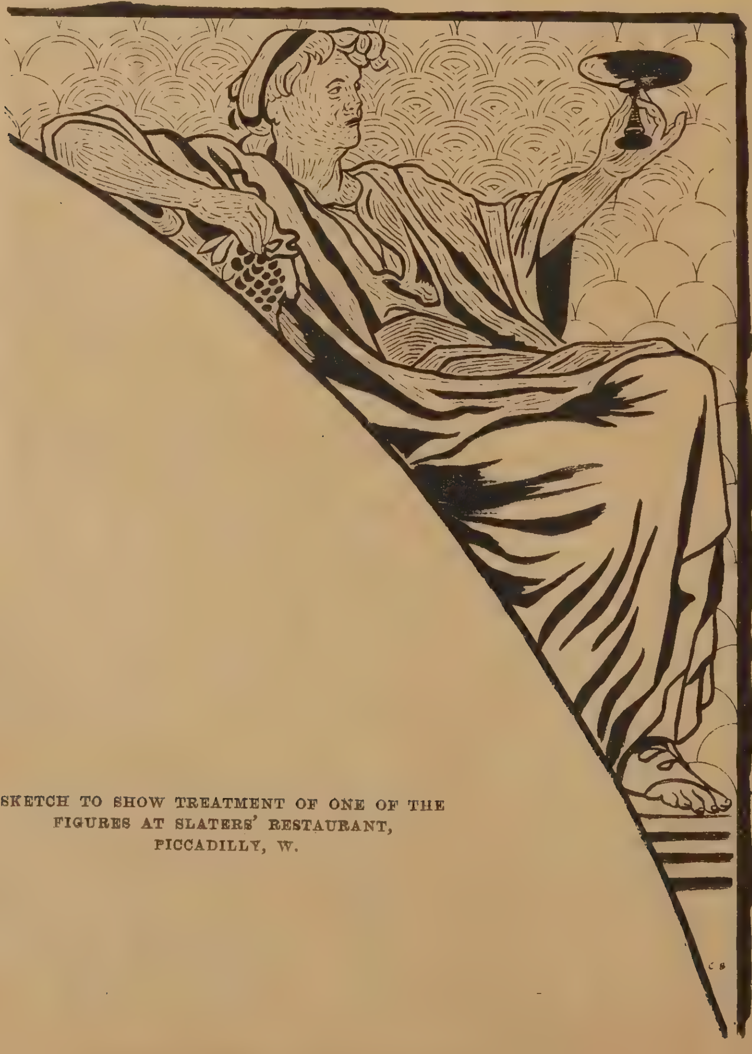
Regarding the details and general treatment of portions of a design, they all require defining according to the position of the work. Outline need not be apparent when the finished work is to be placed within 2ft. or 3ft. of the spectator, and it can be used or dispensed with, according to the value required by parts of the design at all heights. Of course, at about 20ft. the outline is very useful, although scarcely perceptible from the ground, and the higher the mosaic is placed the broader and blacker can be the outline. Ornament at all heights receives additional sharpness and life by the use of a decided outline. Against a gold background a very decided outline should be used. Black will never be too strong, as gold tends to take the strength out of all colours that are used against it.

Ornament ought to be worked in very crude colours, as at heights above 10ft. or 15ft. beautiful dark purples tell only as black, dark rich greens are only smoky-looking colour, blood-red becomes almost Indian-red in tone, rich blue becomes slatey, and fine chromes look like brown paper. To counteract this the worker introduces lines of other colours to lighten the ones in use, white and yellow into greens, or lighter greens with dark tones, lines of cobalt into Prussian blues, yellow with red, while yellow may be toned with lighter tints, and also white may be introduced; in fact white will be found useful for lightening most other tints, it will liven them up and take away the drabness that distance must give to them. Lighter portions of ornament, where they come upon the main body of colour, as in turnovers to leaves, &c., may be outlined and emphasised with white.

In figure work the hair can be suggested in the design as one tint, as the workman can give the necessary "go" to it by the direction of his lines of tesseræ, and can break it up with lighter lines where they will help the general effect. He may define them into locks but only in a broad manner, the whole telling from below as a patch of colour. The same may be said of the flesh. At a height it will all require outlining, the face, hands and fingers, &c.; but the whole should be regarded as one of the colours in the decorative scheme, and one flat tint is sufficient to suggest in the design, and quite enough spirit and modelling will be given to the mosaic by the direction of the lines of tesseræ, with, perhaps, a slight change in tone here and there merely to break up the surface. If any attempt is made to place glass into the mosaic of a decidedly realistic flesh tint, the finished figure will have a complexion like that upon the wax models in the tailors' windows. The tones should certainly approach to yellows and drabs rather than to pink. There was a great deal of mosaic shown at "The Grafton Galleries" in the middle of the year by an American firm, where this mistake was made in several instances, the flesh being quite naturalistic, with a great deal of pink introduced on the faces, giving quite a Madame Tussaud look to the various groups. Flesh must be treated as a portion of a mosaic decoration, not like a coloured photograph.



ONE OF SIX PANELS AT SLATERS' RESTAURANT, LUDGATE CIRCUS. WORKED BY G. BRIDGE. C. R. GUY HALL, A.R.I.B.A., ARCHITECT.



SKETCH TO SHOW TREATMENT OF ONE OF THE FIGURES AT SLATERS' RESTAURANT, PICCADILLY, W.

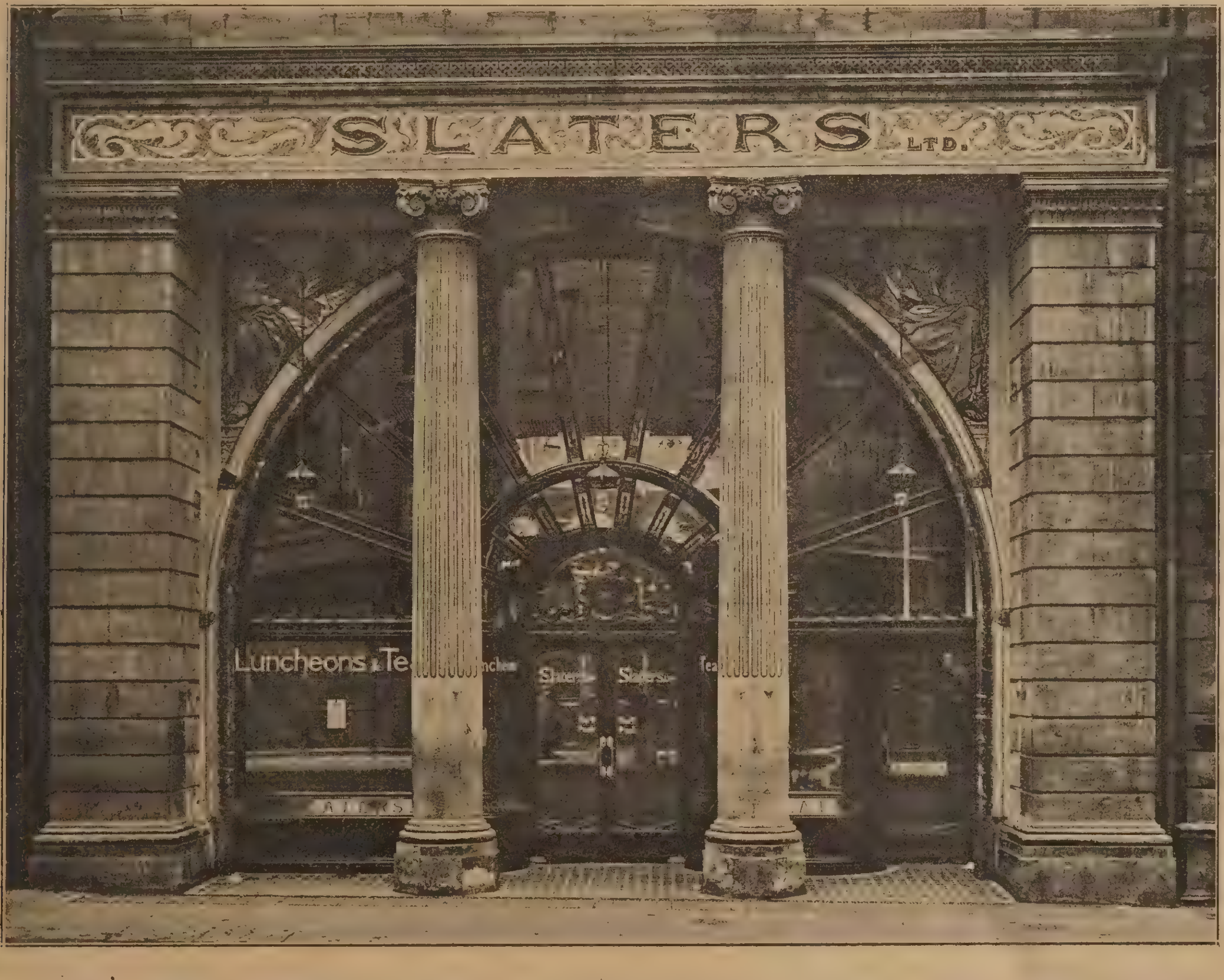
Drapery should be designed so as to obtain folds in large masses of colour; the light and shade should be obtained by the use of two tints of each colour, or two colours in harmony, or even by two contrasting colours; of course, it can be left to the artist to enrich his design by the addition of girdles, trimmings, &c., in which gold, silver and jewels can be shown. The main lines should be big and broad in the handling, and all small folds and detail should be avoided, as they only worry the general design.

The student who desires to study mosaic design cannot do better than to devote his attention to work in position, good or bad mosaic—something can be learnt from both. If he can get to Italy he will not require to give much time to examples elsewhere. There he will find mosaics of all descriptions, good and bad old work, and sometimes good and very often indifferent modern examples.

There is positively no reason to accept every old example as good mosaic; the large copies of pictures outside St. Mark's, Venice, for instance, ought never to have been rendered in mosaic. Again, because there are evidences of very rough work and very open joints in certain positions, it does not follow that in every mosaic, no matter where placed, the work must be executed in a similar manner. It must be remembered that age will cause wide joints to recede from the face a little by a slight contraction, and thus leave a somewhat wider opening and a rougher surface, and also, although in St. Mark's, where the work is about 200ft. high, it is in some cases so rough that the tesseræ stand out ½in. and ¾in. from the cement, it is kept much flatter lower down. Besides, the old workers had different methods, and the student can see where they succeeded and can, when designing and working his own mosaic, assert his own individuality while using the knowledge gained by observation.

When visiting St. Paul's Cathedral and the Albert Memorial, it is as well to provide a field glass, which doesn't say much for the design being appropriate to the height, but still it is a fact that the detail in many cases is muddled and impossible to make out. Of course, this does not apply to the splendid designs under the large dome by Watts, Stevens, and other genuine decorators.

It is curious to notice how Sir W. B. Richmond has been learning mosaic work while employed at St. Paul's. The earlier work is almost undecipherable owing to its being so weak in colour and drawing, but the work has been increasing in strength of colour until in the last portion unveiled, the south-west quarter dome, the work, if anything, is too hard in colour. The work in general seems too undefined and not severe enough for the building, the drapery in most instances being cut up by the use of gold and silver as high lights, and when the backgrounds consist of the same material the figures have the appearance of the backgrounds coming through them. In fact the panels are, even when seen through a field glass, hopelessly muddled in design.



SLATERS' RESTAURANT, PICCADILLY, W., SHOWING TWO MOSAIC FIGURE PANELS DESIGNED BY ALFRED DRURY AND WORKED BY G. BRIDGE. C. R. GUY HALL, A.R.I.B.A., ARCHITECT.

A Lunatic Asylum near St. Albans is proposed to be erected by the Middlesex County Council, but is greatly objected to by the local authorities, who say that such a building would spoil the picturesqueness of the place.

MODEL ANSWERS TO EXAMINATION QUESTIONS.

Answers to Questions set in the Examination held by the Society of Architects in April, 1899.

By G. A. T. MIDDLETON and R. W. CARDEN, Associates R.I.B.A.

(Continued from page 244, No. CCL.)

VIII.—SANITARY SCIENCE, &c.

1. *Explain the difference between a "hard" and "soft" water, and institute a comparison as to their relative suitability for general domestic purposes. What is meant by "temporary hardness" and "permanent hardness" as applied to waters?*

Soft water is pure water, such as is considered suitable for a domestic supply, that is, water containing not more than 0·02 parts of organic nitrogen, or 0.2 of organic carbon in 100,000 parts. Hard water is water containing salts of lime and magnesia, principally sulphate of lime, carbonate of lime, sulphate of magnesia, and carbonate of magnesia. Temporary hardness occurs in those waters in which the hardness is due to the presence of *carbonate* of lime or *carbonate* of magnesia. It is described as "temporary" because boiling renders the water soft. Permanent hardness occurs when the hardness is caused by the presence of *sulphate* of lime or *sulphate* of magnesia. Boiling the water is ineffectual. A perfectly soft water is unpalatable.

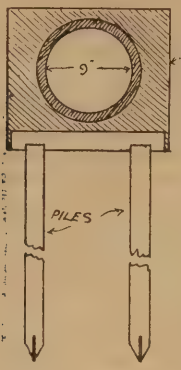
2. *Give particulars of the materials, nature of joint, and general method of construction you would adopt for a 9in. diameter drain laid in water-logged ground when the bottom of the trench is* (a) *compact gravel,* (b) *running sand. Illustrate your reply with sketches.*

In case (*a*) the drains being laid in a good bearing soil, 9in. diameter stoneware pipes (Doulton's "tested" or other approved types) might be used, jointed with Portland cement; the cement to be of good quality, weighing 112lb. per bushel and passing 90 per cent. through a sieve of 2,500 meshes per square inch. In case (*b*) piling would probably have to be resorted to in order to obtain a satisfactory bottom. It would be better to use cast-iron socketed drain pipes of the requisite diameter as the pipes run in greater lengths and the joints are consequently fewer. Joints should be carefully caulked and run with (metallic) lead. The piles should be driven in pairs, one pair under each joint, and connected transversely by runners. On and around these runners is a layer of concrete laid to fall, upon which rests the drain, which is eventually embedded in concrete (see illustration on next page). The sides of the trench would have to be strutted, and planked and strengthened, perhaps, with guide piles if the ground were very bad.

3. *What is meant by "cross ventilation?" Describe the general construction of an anemometer, and state how you would determine the velocity and volume of air passing through a vertical exhaust shaft fixed at the ceiling level of a room.*

Cross ventilation is, as its name implies, a method in which the air enters the apartment at one side or end and goes out at the opposite side or end; the object being to obtain as nearly as possible a horizontal current of air.

An anemometer is an instrument used for measuring the velocity and pressure of the wind —or air currents generally. The best known one is "Robinson's," which consists of a casing



DRAINS IN BAD SOILS

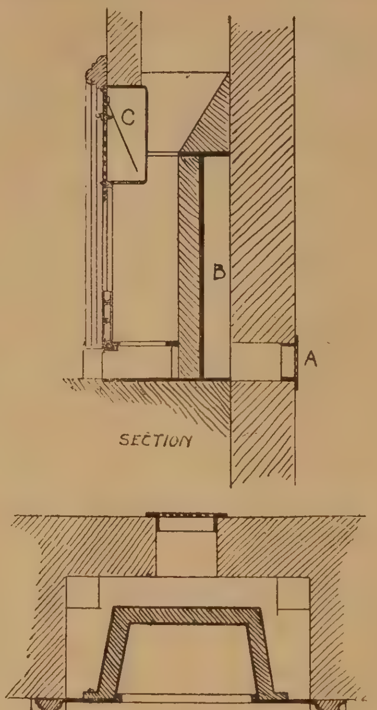
containing two horizontal bars crossing each other at right angles, each of the four extremities having hemispherical metal shells attached. This is arranged to revolve quite freely upon a pivot, the velocity of the current of air producing motion in the "wind-mill" being proportional to the rapidity of rotation. The velocity of the air should be determined by using an anemometer as described above, and the velocity thus obtained multiplied by the area of the air duct (or the number of units of velocity in contains), which will give the volume.

4. *Mention some of the chief points to be observed in arranging and fixing gas-pipes within a building. What sizes of service-pipes are necessary to efficiently serve four, ten, twenty-five and fifty gas burners respectively? Describe the method you would adopt for the purpose of testing the gas pipes and fittings at the completion of the work.*

The pipes leading from the meter to the points of consumption should be of wrought-iron with screwed joints, laid upon the surface so as to be easily accessible. Lead or composition piping should be avoided as it could be easily gnawed by rats, and if laid under plaster may inadvertently be pierced by picture nails. All cocks should be full-way, and all angles made with screwed elbow or tee pieces. Service pipes for four burners should be ⅜in. diameter; for ten burners, of ½in. diameter; for twenty-five burners, of ⅞in. diameter; for fifty burners, of 1¼in. diameter. In testing, all gas outlets should be capped tightly before the various fittings are attached, and the whole system of piping tested by connecting a water gauge 20in. long and by means of a gas-fitter's air pump raising the pressure to 18in. This pressure should be maintained for four hours without showing any decrease. Fittings should be tested separately.

5. *Give a short description and explanatory sketch of a ventilating stove, with fresh air inlet. What are the chief characteristics of a "high pressure" and "low pressure" hot water apparatus respectively? Which system is generally used for warming ordinary buildings, and why?*

Ventilating stoves are of many varieties, but in all of them the object is to bring fresh warmed air into the room. In the stove illustrated (Grundy's) the fresh air is brought in at the back at the point marked A, and passes thence into the warm-air chamber B, which extends, as shown on plan, round the sides of the firegrate. From here the air passes out into the room through a register C fitted with regulating adjustment (see illustration). In "high-pressure" hot-water heating the boilers used consist of coiled tubes capable of sustaining pressures up to 500lb. per square inch. The circulating tubing is of wrought-iron of small diameter, carrying water which is heated to a temperature of from 200deg. to 500deg. Fahr. The boiler must be placed below the level of the lowest room to be warmed. The "low-pressure" system is cheaper and requires much less care in its manipulation; the pipes used are larger in diameter, and almost any form of boiler may be employed. The temperature rarely exceeds 200deg. Fahr., and the air is more equally warmed throughout the apartment, and the heat more easily regulated. There is very little danger from fire.



SECTION

PLAN

WARM AIR STOVE

The low-pressure hot-water system is that which is most usually adopted in ordinary buildings; some of the reasons have been given above but may be recapitulated. The first cost is as low as that of any other system, while in the subsequent cost of maintenance it is by far the cheapest. The temperature diffused is equable and not of an objectionable "parched" nature; easily controlled and regulated; above all, there is less risk from fire than in any other method.

6. *Describe in detail the procedure you would adopt, and the several tests you would employ in conducting an exhaustive examination of the existing water supply, drainage, and sanitary appliances of a small country house. Mention the various details of construction and general arrangement which you would particularly notice.* (*This question was voluntary.*)

The first thing advisable to do with regard to the water would be to have samples analysed by a competent analytical chemist, while at the same time the source of supply should be inspected in order to judge whether it is in such a position or of such a nature as to render the possibility of temporary pollution sufficiently urgent to require guarding against. There are three principal sources from which domestic water supplies may be obtained: from a gathering ground and reservoir, from pure water lakes or rivers, and from springs or wells—not shallow wells. From whichever of these the supply is derived, careful investigation must be made in order to see that nothing deleterious exists sufficiently near to the source to menace its wholesomeness. Filters, of whatever form, should be thoroughly tested for efficiency. For supplying the water to points in the house lead piping is considered the best, jointed with wiped joints; the cistern should be of lead or other approved material, with a close-fitting cover, and placed where it can be easily got at for periodical cleaning. Supply pipes should be taken off the rising main, and w.c.'s served from small cisterns isolated from the main supply. For testing the drainage of a house, the underground works should be tested with the standing water test, and the condition of all manholes, &c., carefully examined. If the system is found to empty into a cesspool the position of this and its construction, facility of emptying, &c., should all be carefully taken into consideration. If the house is old, the water closets should be submitted to the most careful scrutiny. Possibly "D-traps" may be found fitted to them, and they, of course, must be removed and others substituted. Sufficient water for flushing purposes must be supplied to each closet, which may be tested by means of plumber's soil and two or three pieces of paper thrown into the basin. This should be all cleared out with each flush. Bath and lavatory wastes should be of a sufficiently large bore to carry off the water at a fair rate. No waste pipe should be smaller in diameter than the grating above it. The wastes should have efficient water seals, and from the crown of each out-go should be taken an anti-syphonage pipe (this applies equally to the traps of soil pipes). It would be well to ascertain also whether the house is proof against damp, either from the ground below or from leakages in the roof, the latter being the most probable source of damp. All missing and broken slates should be made good, the gutters and down pipes, &c., overhauled and generally made perfect. Windows and doors should be examined with regard to their hanging and fitting, and should always be treated as a possible entry for draughts. Floors, skirtings, and similar parts should be thoroughly inspected for vermin, or to see whether they are likely to form a harbourage for these pests.

MR. CHAMBERLAIN ON ART.

MR. JOSEPH CHAMBERLAIN distributed the prizes at the Birmingham Town Hall last Friday, to the students of the Municipal School of Art. He said that after perusing the addresses of some of the eminent practitioners of art who had previously occupied his position, he gathered that art, or those who pursued it in any shape or form, constituted a priesthood removed far above and beyond the aspirations of ordinary men. Their industry must be indefatigable, their patience must be inexhaustible, and their reward must be found in the success of conscious virtue. But was there not something a little excessive in those idealisations? He had read something of the lives of the great masters of art in classical and mediæval times, and he had found that those men were exceedingly human in their defects as well as in their virtues, and full of personal ambition, anxious for the respect and the praise of their fellow men, and not indifferent to the material delights which the successful and honourable pursuit of a great profession brought with it. Under these circumstances he was not disposed to advise them at the outset of their career to practise this excessive altruism. On the contrary, it seemed to him that the labourer, whether in art or in anything else, was worthy of his hire, and that he might fairly look forward to a reasonable reward for his exertions and his merits. While he thought they should not despise these motives—to exercise which had frequently opened the springs to high endeavour—yet their success would be the more assured if their aims were moderate, and if their ambition was not of the kind which o'erleapt itself. It was not the object of such a school as theirs to manufacture genius, and if it was its object it would certainly fail, for it was not in the power of any school to turn out, say, Titians or Rembrandts by the dozen or the score. These great men, these geniuses who occurred now and again in a generation, he fancied would do in the future as they had done in the past without these extraneous aids to success. Genius could not be repressed. It was not the geniuses, but the vast majority, whom a school such as theirs desired to help. Any attempt to manufacture genius would only result in the multiplication of mediocrities, for which there was already insufficient room in the world.

They had to help the majority of ordinary workers in trades or crafts that lent themselves to art to do their ordinary work better, and to show how objects in common use could have a grace and harmony of their own, a fitness and appropriateness which they would never have if they were always produced by the uninstructed eye and the uninstructed hand. Therefore, if he were to venture to describe the function of such a school as theirs in a sentence, he should say that it was to educate first-rate craftsmen, and not to multiply tenth-rate artists. After all, it was a much nobler task to strive successfully to add grace and beauty to the accessories of their ordinary human life than to fail ignominiously in producing masterpieces, which only the rarest talents could hope to accomplish.

If their object was the improvement of common things rather than the production of masterpieces, he was led to make one inquiry to which he had never seen a complete answer. Why were our common things, the things with which we lived, with which we passed our lives, which were of infinitely greater importance to our education than even the masterpieces which we saw occasionally for a few hours or minutes in our great picture galleries —why were these things, which were part of our everyday life, so inferior and so inartistic? If they looked back a little—say 100 years or so—they found that all those ordinary belongings, the furniture, the embroideries, the carvings, the metal work, the pottery, however humble they might be, however modest in their pretensions, were nevertheless now sought by collectors at prices altogether beyond their intrinsic value, sought as works of art. He did not think the product, he would not say of to-day, but the product of thirty years ago, was likely to be sought after with a similar object by the collector. There seemed to have been a gradual and almost continuous deterioration from the time of Queen Anne, and going back further still they found this falling off until it reached its acme in the early days of the reign of Queen Victoria in a condition of hideous ugliness and vulgarity which had never been paralleled in the history of the world. But what was the cause? That in the interval of which he had spoken the condition of the people had wonderfully improved. They were more prosperous, more refined, better educated, and yet all their belongings showed infinitely less of interest, of harmony of design, of beauty of colour and of correctness of proportion. He thought the reason was to be found in the further increase of prosperity of which he had spoken, and especially in the great, the vast, and even the disproportionate improvement in the condition of the masses of the people. People, poor people, who, up to that time, had never considered the possibility of doing anything but provide themselves with the merest and the barest necessaries, began to find that it was within their means to add many comforts of which they had hitherto been ignorant, and they desired naturally to secure for themselves in some form or another the advantages which hitherto had been the privilege of the rich. As their wants multiplied, although their condition had improved, their means were not sufficient to supply those wants except in the cheapest form. They could not afford the price for originality of design, and hence it came about that in the early period of Queen Victoria's reign the whole energy and ingenuity of manufacturers were directed to producing by machinery, in enormous quantities and at the lowest price, imitations of the articles which had previously been used by the rich alone. The effect of that was that instead of a production which was single and separate, and in which every article bore the impress of its designer's mind and character, the machines made reproductions which could not possibly be expected to be equally artistic.

Another result which followed with equal certainty was that the British workmen lost his original gift. He was no longer called upon to exercise it; the demand had ceased for these single articles, and he was only part of the vast machine which was engaged in turning cut endlessly and ceaselessly articles for the million. If that was a correct explanation of the extraordinary degradation of art in the period when the first beginning of this great prosperity dawned upon us, it must lead us to moderate our aspirations for the future. If it be true, as the late William Morris once said, that art had failed as civilization had advanced, we could not afford to give up civilization. However ugly might be these mechanical reproductions, we could not abandon the comfort, the health, the general happiness which had been brought about by the cheapening of articles in common use—the articles, in fact, upon which the domestic life of the masses of the people so largely depended. But he did not for a moment say that we ought to be satisfied with our present results. It seemed to him that while we must accept the conditions of our time, while we must recognise the necessity for seeking the assistance of machinery and of all the devices which would bring within the reach of the many, if not the highest works of art, at all events something elevating and something which might be accepted as a provisional substitute for them, still he thought such schools as that with which they were concerned might do and had already done a great deal to improve both the general taste and the general quality of the work which was turned out. There would always be, he hoped, liberal-minded communities and wealthy people to whom cost would not be the first object, and who would desire to possess themselves, and to endow the country with, stately buildings, with objects of art, with priceless pictures, with beautiful statues; and it was one of the objects of such a school as that to enable them to gratify their wishes and aspirations, finding craftsmen who were worthy to carry out such desires. At the same time the school must also endeavour to cater for the many, and in spite of the limitations of manufacture it was his conviction—and he believed experience showed this—that a great deal might be done to give simplicity of design, to give a certain grace of form and general appropriateness which would very materially improve those reproductions to which he had referred, perhaps, in terms of depreciation.

Since the development of art education, which began about the period of the Great Exhibition in 1851, there had been a great advance, upon which we had a right to congratulate ourselves as to the past, and to express sanguine hopes as to the future. He commended the Birmingham School of Art for what it had done to accomplish the union of the craftsman with the designer. To enable the man who was carrying out the work to have some say in the character and shape, to enable the designer to go to his design with a knowledge of the limitations of manufacture, that indeed was to reproduce to a great extent the conditions under which art reached so high a character in previous centuries. There had also been a quickening of interest in the work of the school, and something had been done in a direction which perhaps was more important than all towards educating the public to a higher appreciation of an artistic sense, which, he was afraid, it would be flattery to say that they possessed before. Then, again, the municipal spirit had begun to work, and he believed the time was coming when the people of Birmingham would refuse to tolerate bad architecture in their midst or sordid buildings.

It was said by a great artist that the only people in civilization who were really happy were those whose necessary daily toil was inseparable from their pleasure. Mr. Chamberlain was not certain that, judged by that standard, there was very much of pleasure in the ordinary daily toil of the ordinary artisan. In our present system the ordinary artisan had to perform the same monotonous operation thousands or hundreds of thousands of times, day after day, year after year, during the greater portion of his life; and the infinite multiplication of ugly things could not, he feared, be considered as a very elevating pursuit. But if they could even in the slightest degree introduce into that man's life the element of art, there came in with it all the freshness of originality, the pleasure of imagination, and the individual interest which would add so much life to the humblest work.

Professor Huxley's Statue is now finished, and will be removed from Mr. Onslow Ford's studio to the Natural History Museum at South Kensington, where it will remain.

Under Discussion.

BUILDINGS IN THE HOLY LAND.

In the course of the lecture on "Ancient and Modern Buildings in Palestine," delivered before the Leeds and Yorkshire Architectural Society on December 4th, Mr. Beresford Pite said that the architectural interest of Palestine began with caves, followed by rock tombs, cisterns, oil and wine presses, and sculptured and carved sarcophagi. The architectural influences began with the Egyptian, after which Phœnician and Assyrian influence could be traced. Then followed a Greco-Roman period, then a period more exclusively Roman; and, passing to the Dark Ages, the Arab period was reached—the Arab busying himself with dismantling the Roman buildings and using the materials in his own erections, very often in an absurd way. Following the Arab time came the Crusading period, which covered Palestine with the most interesting examples of mediæval art, similar to what could be found in France and England, and even Germany. Then there followed the long period of Turkish darkness, which was succeeded by the modern era, out of which was growing a definite modern style in the European buildings; and, sad to relate, our own local Gothic revival had some rather *outré* examples in the Holy Land. The building material of Palestine was a hard limestone of coarse grain, and consequently there had not been carried out in that country any ornament worth the name. There was nothing in the whole country to correspond with the marbles of the Greeks, or the granites at the disposal of the Egyptians. Dealing with local regulations and authorities, Mr. Pite explained that when foreigners desired to erect buildings of any size in Jerusalem, an Imperial firman had to be obtained from Constantinople. A fuller report of this same lecture appeared on page 394 of the Builders' Journal dated January 25th last.

NOTES ON ART.

Some "Notes on Art" were given by Mr. W. M. Page at a meeting of the Edinburgh Architectural Society held on December 6th. Mr. Page said that art, like man, had a life and consequently a history. Art in architecture originated in Egypt, and through Greece and the Renaissance was brought down to the present day. In earlier days architects had more freedom: they were not hampered by a public the bulk of whom possessed no artistic taste, for, nowadays, beauty in architecture was considered, by the many, to be unnecessary —the main thing was pecuniary gain. By the modern system of education in our schools, *Art* was not taught, but only a little technical skill. Art might be defined as the interpretation of nature, or, as applied more particularly to architecture, as fitness, truth, simplicity or refinement. Elaboration in a building should not be confined to one part, such as one elevation only or on the outside only, but should be applied equally to produce a harmonious whole. Architects in modern times were often employed not to design a building but merely to carry out the desires and whims of a client. Imitation was a characteristic of present-day architecture, everything being made to represent something better than it really was. Art in buildings had a greater influence upon the public than in pictures or other forms of art, owing to the prominence of these buildings in streets, &c., where they greeted the eye of every passer-by. The history of art was, however, not yet finished, and it was satisfactory that the architectural profession contained a large number of thoroughly artistic men. Some discussion took place upon a few of the points raised by Mr. Page in his lecture.

THE SMALLEST CHURCH IN CORNWALL.

The Church of Tremayne in Cornwall was the subject of a recent lecture by Mr. Edmund Sedding at the Plymouth Institution. What made it remarkable, lacking as it did detail and delicacy of workmanship, was the character which these old builders displayed in going into a little out-of-the-way place where there were only a dozen cottages. The colour of the stones used in its construction and the thickness of the walls indicated that the church was built probably in Norman times. It was the only church he knew in Cornwall without any sign of an aisle or transept. The upper part of the tower was of fifteenth century date, the lower part being at least two centuries earlier, but it was badly built. It was only 45ft. high. The pinnacles were falling outwards, but they could be brought upright, the lecturer observing that they were beginning to learn how to restore ancient monuments in this country. It was the beauty of proportion which was so thoroughly understood by old builders that made these ancient churches so charming to the eye. The eaves of Tremayne Church could be touched from the ground. Perhaps the most interesting feature was the little Norman doorway, the smallest he had ever seen or heard of, it being only 18in. wide. At present it was blocked, but it was proposed to open it up. Looking at the church from inside, which was only 15ft. wide and about 40ft. long, they saw that the pulpit could only be occupied by a short preacher; a tall one would knock his head against the roof. The old roof remained unrestored, the curved ribs having been hidden by plaster at the beginning of this century, and it was a debatable point whether the plaster would not now be removed. The font was early Norman, although most probably fashioned by Saxon workmen from Norman designs. The idea had grown among the villagers of Tremayne that the old church would have to be pulled down. He was applied to by the vicar in despair, and he suggested taking away half the wall and fixing a new piece to the remaining portion. This would not disturb the outside face at all, and the inside would be plastered up like the old. He also suggested the addition of a flying buttress in the treatment of a bulging wall. Not only did the old churches show the force of character and the love of the old builders in their work, but their age gave to them a natural beauty which it was impossible to imitate. It was incumbent upon everyone, therefore, to raise his voice against the old churches being spoilt, and some strong effort ought to be made to rescue or, at any rate, maintain the works of tradition.

THE ADVANTAGES OF AN IRISH CHANNEL TUNNEL.

The promoters of this scheme do not say it is possible, but they maintain it is the duty of the State to determine once for all whether the scheme is possible, because if it is then it ought to be carried out. They wish to obtain scientific certainty on the subject. Mr. Pirie, M.P., said recently at Aberdeen that in the past most of the great schemes which had contributed to the progress of this country, and the world at large, had been treated with ridicule when the proposal was first brought forward. The proposal to construct a railway between Portsmouth and London was opposed tooth and nail by the Duke of Wellington. The construction of the Suez Canal was utterly opposed by Lord Palmerston. Schemes for the construction of subaqueous tunnels were very far from being new; the best known was the scheme for constructing a tunnel between France and England under the Straits of Dover, and he mentioned that it was only decided by a majority of one in a Committee of the House of Lords that it should not be proceeded with. The least difficulties and obstacles in the way of that tunnel were those connected with engineering. It had been stopped entirely for political reasons, reasons which in the case of a tunnel between Great Britain and Ireland did not exist. In connection with the various proposals for an Irish tunnel, he referred to the efforts of Sir Edward Watkin and several eminent engineers. Mr. Barton, the well-known engineer, was now, he stated, a member of the Irish Channel Committee, and the line he proposed as the most feasible was the one which the Committee had adopted. This line would leave the existing railway at Stranraer, on the west coast of Wigtownshire, and pass north about six miles, afterwards descending by a gradient of 1 in 72 to the tunnel, which struck the Irish coast on the promontory of Island Magee and joined the service of the Belfast and Northern Counties Railway. The train would have to proceed on a third line of rails owing to the fact that Irish railways had a broader guage than those constructed in Great Britain. The length of the tunnel beneath the sea would be twenty-five miles; but there would be five miles below land at each end, so that the total length of the tunnel would be about thirty-five miles, whilst the total distance between Stranraer and Belfast would be about fifty-three miles. All experience went to prove that in tunnelling under the sea there was less water found than in tunnelling under land.

The advantages which would accrue from the construction of such a tunnel were, first, the political, in which he included the military and defensive; second, the commercial; and third, the international. He thought a matter like this would be entirely outside party questions, and with regard to the military aspect of the question, he stated that they had Lord Wolseley just as strongly in favour of this tunnel as he had been opposed to the Dover tunnel. As to the commercial advantages, the actual trade between Ireland and Great Britain was very large, the Scotch coal trade and other industries being especially large, and these would be increased to an enormous extent. From London to Belfast at present the quickest journey was done in twelve and a half hours; if the tunnel were constructed it could be done in about nine and a quarter hours, diminishing the time by one quarter. From Manchester to Belfast occupied eleven hours; with the tunnel it could be done in six. From Glasgow to Belfast, Londonderry, and Dublin, at present occupied six and a half, ten, and ten hours respectively; if the tunnel were constructed it could be performed in three and a quarter, five, and six and a half hours respectively. The journeys would be practically half what they were at present. From Aberdeen there would be a reduction of at least four to six hours to all the principal Irish towns.

The scheme might not pay immediately any direct profit, but the indirect gain politically, commercially and internationally would pay the construction of such a tunnel a thousand times over.

NOTTINGHAM MASTER HOUSE PAINTERS.

The third annual dinner of the Nottingham branch of the National Association of House Painters of England and Wales was held at the Albert Hotel, Nottingham, last Thursday evening. Mr. J. F. Marshall presided, and the large gathering included — Mr. T. Preston (Burnley), Mr. J. Ratcliffe (Bolton), Mr. Howitt, Mr. W. Robinson, Mr. Jarvis, Mr. W. Bee, Mr. W. Windle, Mr. Simms, Mr. F. Carpenter, Mr. Morriss (Liverpool), Mr. Loune (Hull), Mr. Greenwood (Mansfield), Mr. T. Munks (secretary), Mr. A. E. Shipley. Mr. W. Windle in proposing "The National Association of Master House Painters," said the National Association was prospering and increasing in numbers. Mr. T. Preston, of Burnley, president of the Association, in reply said, following the example of others who had found benefit in associations, they formed their society, and its existence had been fully warranted by what it had already done. They had proved to the public at large that theirs was no mean calling, but was a craft as important as any of those in existence. Since the association had been formed they had a truer and higher conception of the craft; at one time they began to think they were poor painters, and the least and lowest in the building trades, but now they were a respected body of men. They were also promoting the well-being of the workmen, and they had gone in for the education of their boys, inciting them to get on in the higher branches of the trade, and they had technical classes throughout the country. Mr. J. Ratcliffe, vice-president of the Association, proposed the toast of the evening, "The Nottingham Masters' Association," and in doing so referred to the question of competition. He said they were not brothers at all, as he tried to show in a paper he read at Hereford. Who made the competition? It was their own fault they had not a combine; they wanted a little of the spirit of the men that worked for them. When they took a job they wanted to make something out of it for themselves after allowing ample for labour and material. They must adopt the motto "Brothers all," and allow a little wider margin in their estimates. Mr. R. Jarvis responded; he said since the Nottingham Association had been formed it had done all it could for the uplifting of the trade. There was no association in the country that clung more together than theirs. He referred in a complimentary manner to the indefatigable energy of Mr. Munks, by whom many members had been brought in who hitherto had not seen the advantages to be obtained by joining the association.

Correspondence.

SOME SCANDALS OF LONDON STREET MANAGEMENT.

To the Editor of THE BUILDERS' JOURNAL.

WIMBORNE.

SIR,—"Flooding the roads, causing rivers of mud," that your correspondent complains about on page 258 in your issue for November 29th is, I expect, the only way the authorities, at present, have found out for getting rid of the mud by running it down the sewer. Some years ago I noticed little boys in red jackets with scoops and brushes, scrambling about the roads of London. I thought, can nothing be done to save these lads from broken limbs? To my mind it is comparatively easy for one to make a machine to brush and lick up the dirt and soil. I wrote a letter to the London County Council giving an outline of a machine for that purpose, which was "duly acknowledged." Since then I have had hopes of seeing the machine at work and the streets clean, but, alas, the streets are dirtier than ever. Even when there is no mud, the smell of horse ammonia is dreadful to those whose olfactory organs are perfect.—Yours truly,

W. T. CHINCHEN.

ELLIPSE BY COMPASSES.

To the Editor of THE BUILDERS' JOURNAL.

NEW CROSS, S.E.

SIR,—On looking through my copy of last week's BUILDERS' JOURNAL, I was greatly attracted by the article entitled "Ellipse by Compass." This article is supposed to be the execution of an impossibility, and I much prefer the statement of the Science and Art Department, "that the ellipse cannot be struck with the compass," to that which Mr. Ramm states at the head of his article. He says "that it is not intended here to go into the analytical demonstration of the figure worked by his method," with, I suppose, the object of proving it to be a true ellipse. As I am greatly interested in the striking of this curve, I should feel greatly indebted to him if he can analytically demonstrate it to be a *true* ellipse. The method described gives a very fair approximation of that which it is intended to be, but I think that anyone who draws the curves to a large size—that is, one by the use of the trammel and the other by this "new" method—will easily see that with given axes the curves do not agree. Approximate ellipses have been drawn by the use of compasses for many hundred years, and are better and more truly known under the name of three, four, five, six, seven or more centred curves. During my experience, I have repeatedly had to point out that no approximation gives such a beautiful line as the true ellipse. I have also had to contradict the statement which Mr. Ramm wishes to prove true, that "the ellipse can be constructed with the compass."—Yours truly,

RUFUS E. MARSDEN.

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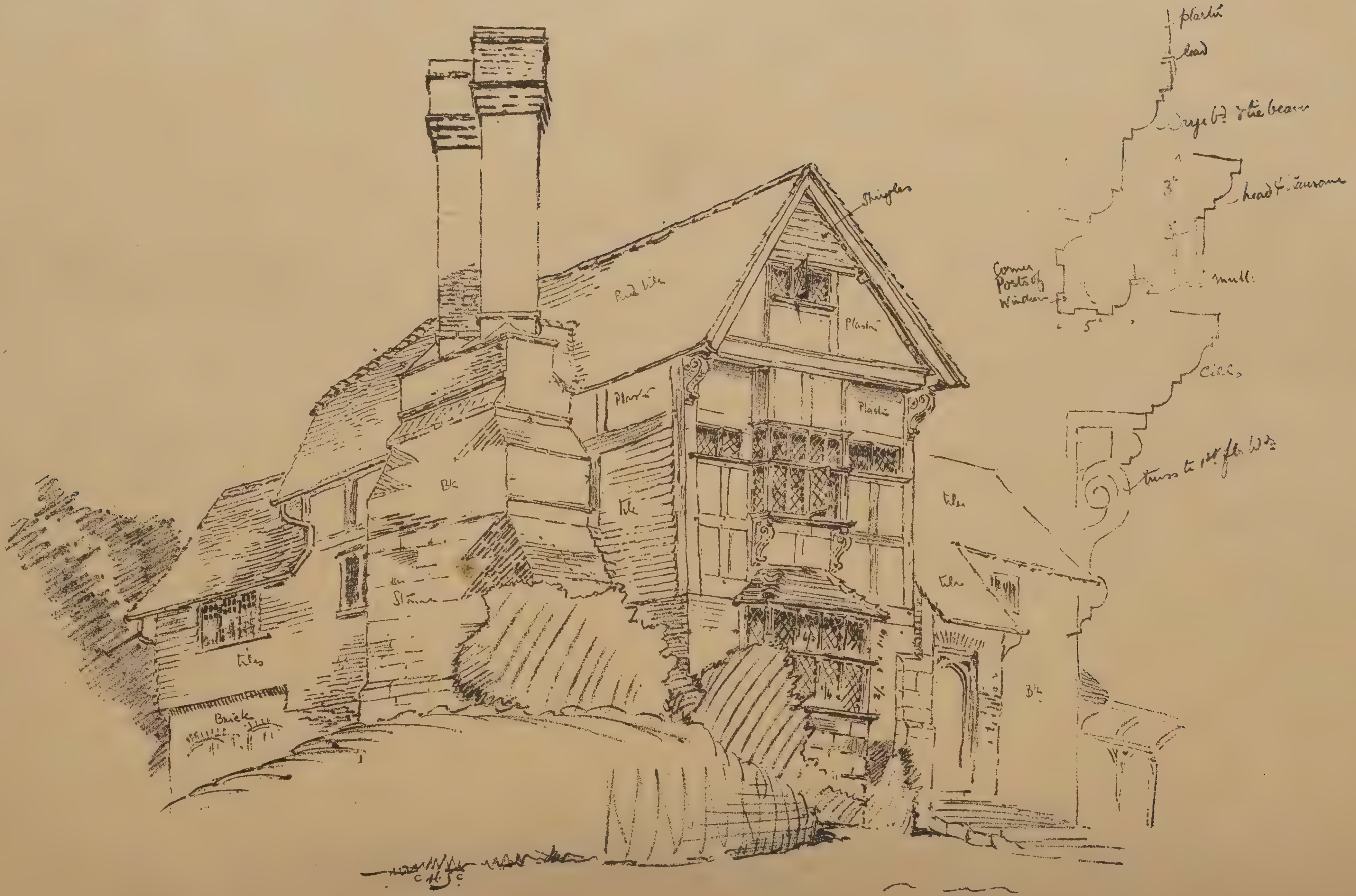

A COTTAGE NEAR PENSHURST. DRAWN BY F. LISHMAN.

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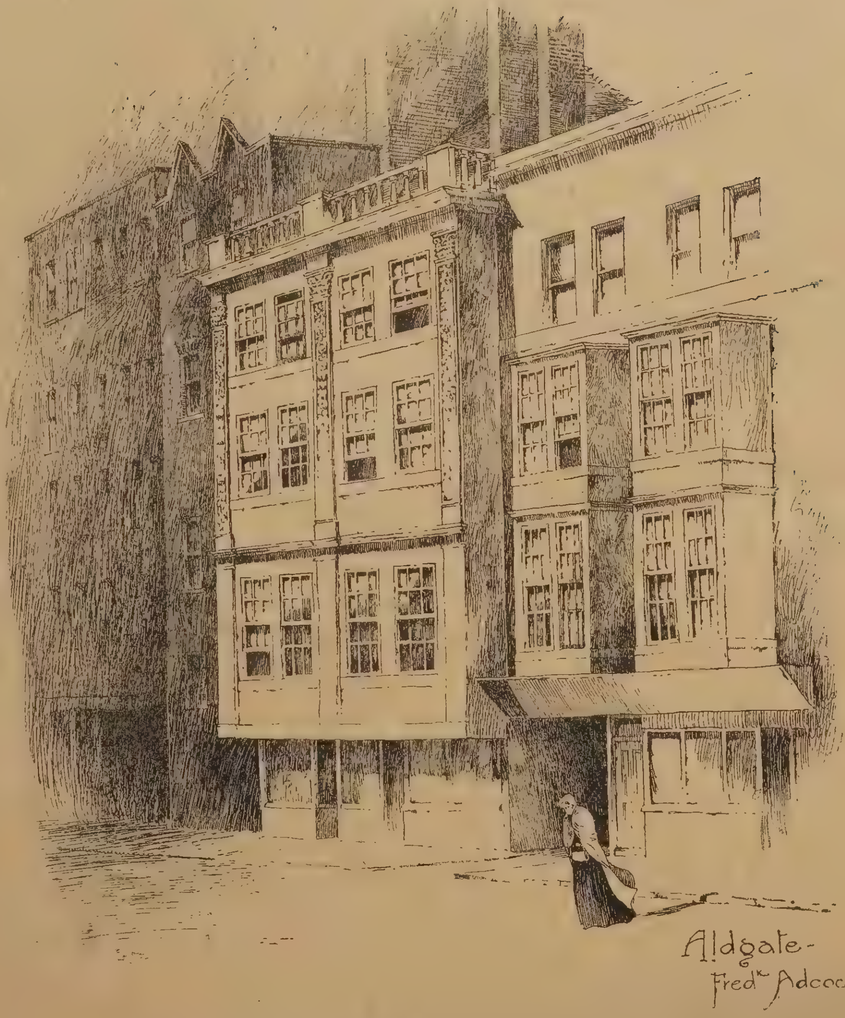
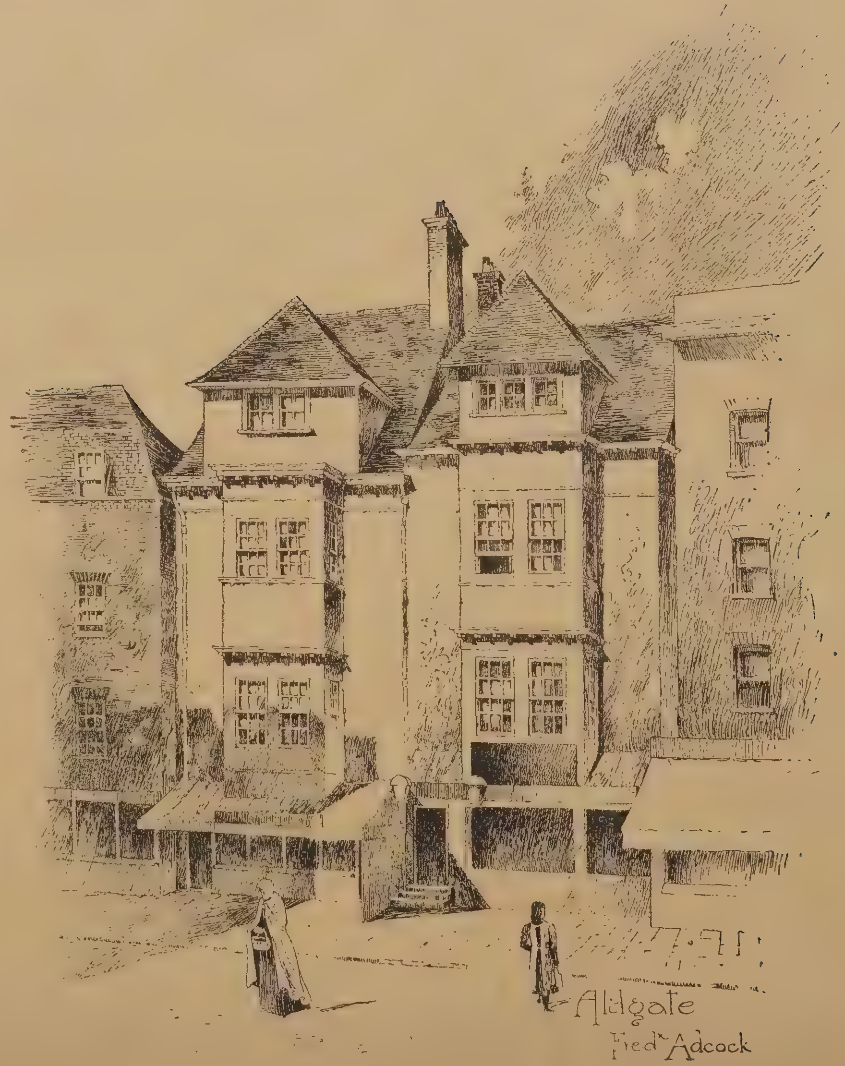
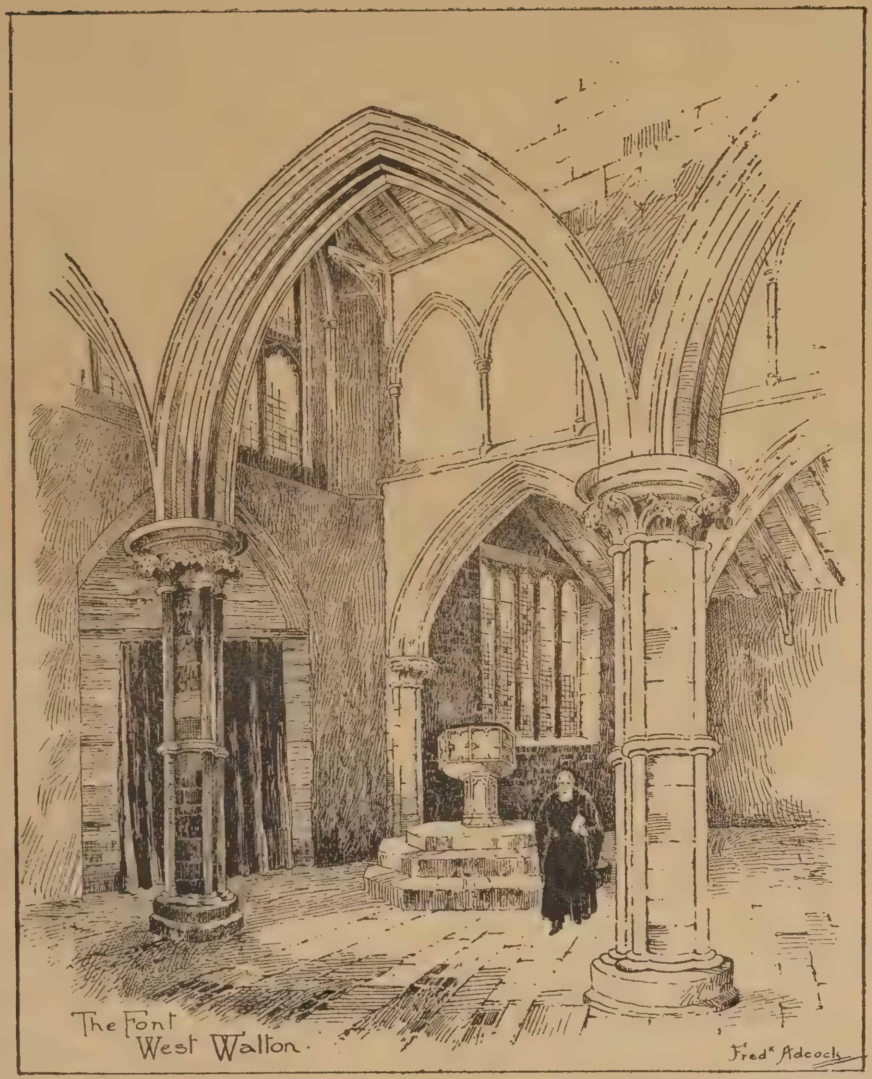


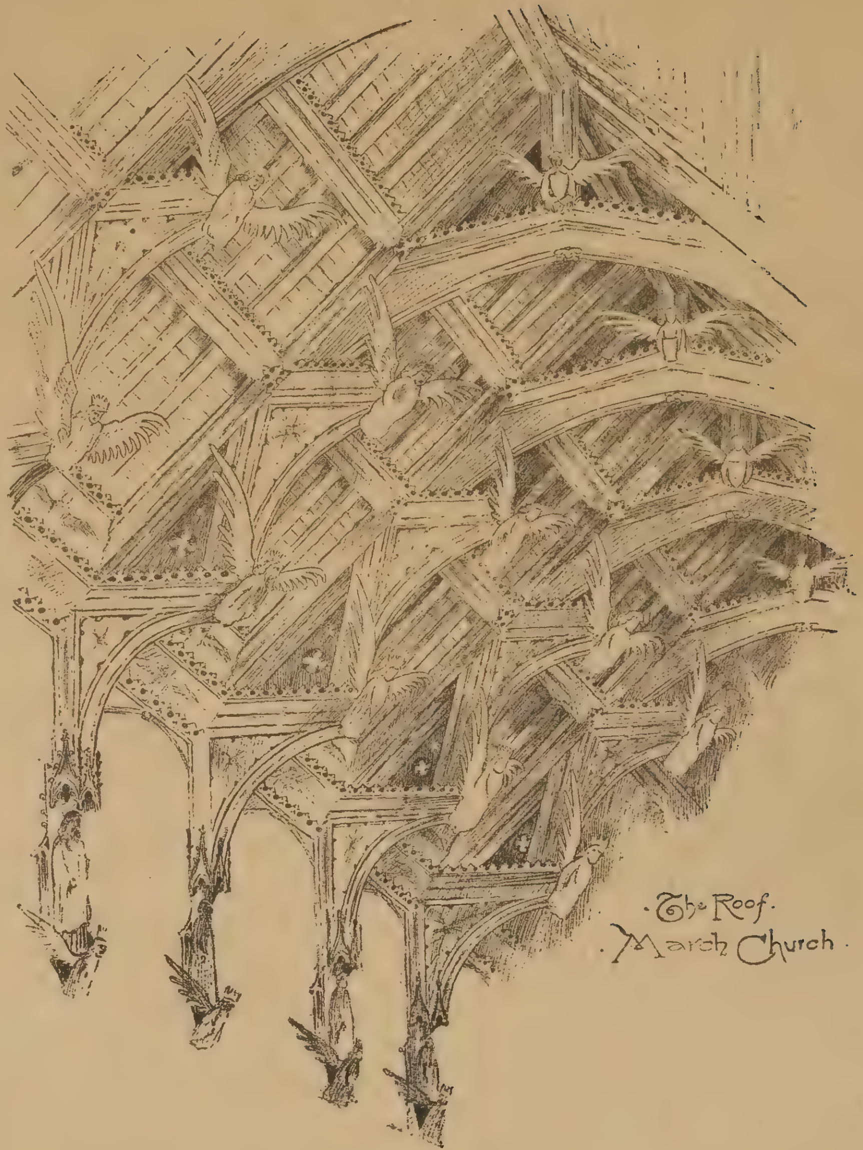


HOUSES IN ALDGATE. DRAWN BY FREDERICK ADCOCK.

SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, WEDNESDAY, DECEMBER 13, 1899.



The Font
West Walton.



·The Roof·
·March Church·

Drawn by Frederick Adcock.

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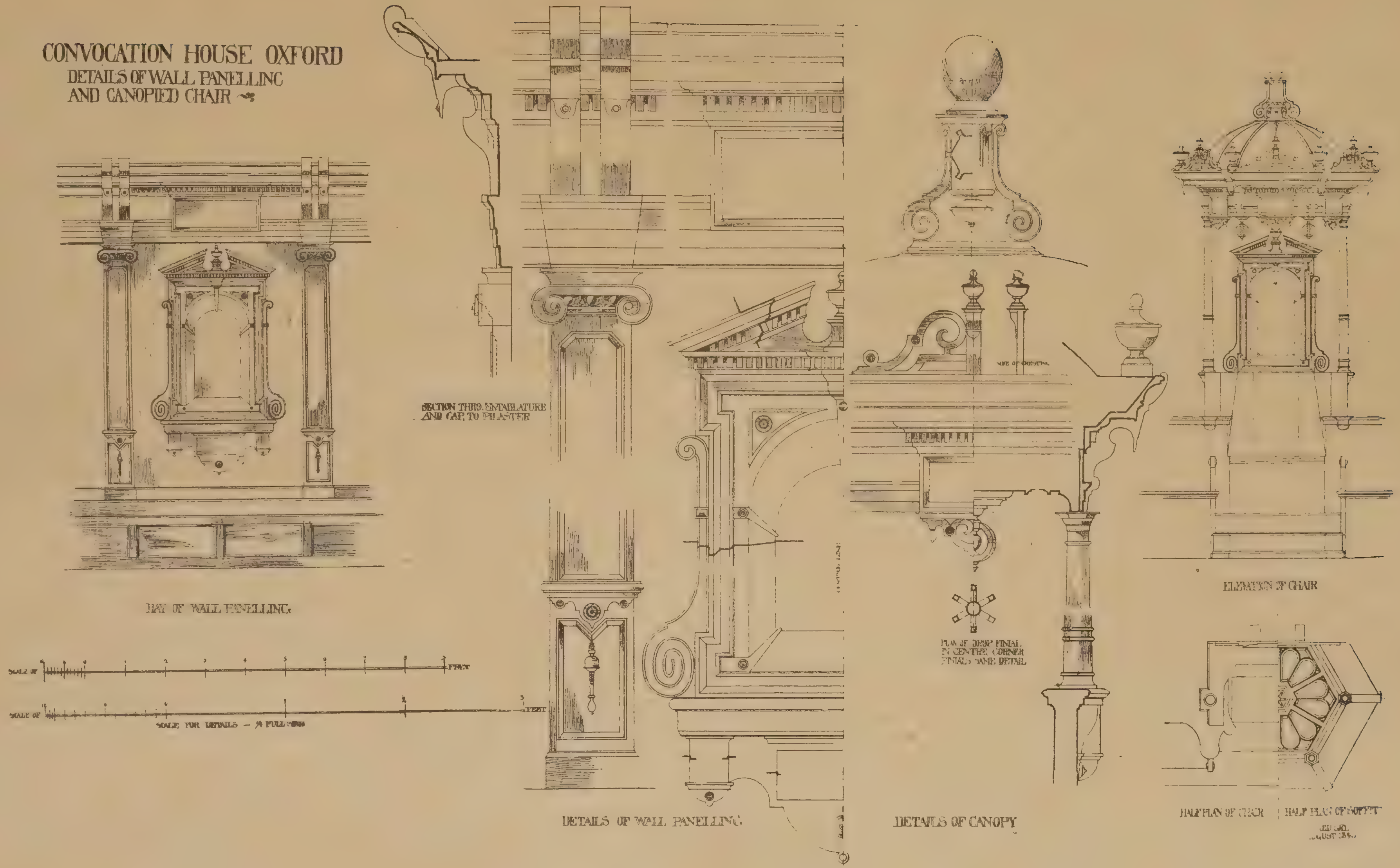
CONVOCATION HOUSE OXFORD
DETAILS OF WALL PANELLING AND CANOPIED CHAIR


BAY OF WALL PANELLING
SCALE OF FEET
SCALE OF FEET
SCALE FOR DETAILS — ¼ FULL SIZE
SECTION THRO. ENTABLATURE AND CAP. TO PILASTER
DETAILS OF WALL PANELLING
LINE OF CEILING
PLAN OF DROP FINIAL IN CENTRE CORNER FINIALS SAME DETAIL
DETAILS OF CANOPY
ELEVATION OF CHAIR
HALF PLAN OF CHAIR
HALF PLAN OF SOFFIT
ALFRED GREIG AUGUST 1899

Measured and Drawn by Alfred Greig.

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Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

SOCIETIES' ADDRESSES.

CARMARTHEN. — STUDENT writes: — "Will you please let me know the addresses of the secretaries of the following: (1) The Incorporated Association of Municipal and County Engineers; (2) The Sanitary Institute; (3) The Institute of Sanitary Engineers."

(1) 11, Victoria Street, S.W.; (2) 72 and 74A, Margaret Street, Regent Street, W.; (3) 63 and 64, Chancery Lane, W.C.

STUDY TO FIT ONE FOR CLERK OF WORKS.

COMBE MARTIN.—W. C. writes:—"Being a general stonemason, aged forty-three, and having a wish to improve myself to fit myself for a building inspector or a clerk of works (have held foremanship), will you please give me particulars of subjects best suited to take up by correspondence class, as I have no chance to attend a technical class, owing to none being held near me. Will you please give best subjects and my best course to adopt; also books (not too costly), and state if examinations are held for clerks of works, &c."

The best subjects to take up would be Building Construction and Constructional Drawing, Drainage, Quantities and Pricing, and Book-keeping; and a good and inexpensive collection of books would be Mitchell's "Advanced Building Construction" (Batsford), Mitchell's "Forty Plates of Building Construction" (Cassell), "Specification, No. IV." (published at these offices), Middleton's "House Drainage" (Batsford), Leaning's "Quantities" (Spon), Stephenson's "Estimating" (Batsford), Hunter's "Self-Instruction in Book-keeping" (Longman's), and Leaning's "Duties of a Clerk of Works" (Batsford). Unfortunately W. C. has passed the age limit of the only examination held for clerks of works, and must rely for appointments upon introductions and personal fitness.

G. A. T. M.

COST OF ACETYLENE GAS.

HEREFORD. — LIGHT writes:—"Could you kindly give any information as to the cost of acetylene gas installation in a country house, and also as to the better kinds of generators, there being so many of poor (and dangerous) quality on the market."

The cost of an acetylene gas installation at a country house would, of course, vary with the number of lights required, but the cost of an automatic acetylene gas generator may be taken at about £1 per light, exclusive of fixing, fitting up, carriage, &c. The cost of piping a house for acetylene gas cannot be taken at much less than £1 per point, as this part of the work must be done in the best wrought-iron pipes fitted together with screw joints of a special kind, and left absolutely sound at a pressure of 10in. column of water. The fittings for acetylene gas must also be of the very best kind. Birmingham fittings will not stand at all. The quality of the metal and the finish has to be exceptionally good or they prove a constant trouble. The fittings, pendants and brackets may be taken at costing 10 per cent. to 15 per cent. more than ordinary fittings of the best quality. Messrs. Strode and Co., of 67, St. Paul's Churchyard, E.C., make a machine which is different from most others in construction, in having the carbide dropped into the water instead of letting the water run on to the carbide. By this system no heat is generated, and the gas consequently does not deposit and block up the pipes and burners.

ANCIENT LIGHTS.

SHEERNESS-ON-SEA.—T. W. P. writes:—"On page 65 (par. 9) of the last issue of "Specification" the right of light is quoted as twenty years. Has this by any act been altered to twelve years? I cannot quote authority, but am informed that in a case recently tried, right was decided on twelve years for dominant owner. Also, I wish to remove light marked 4 on the accompanying sketch (not reproduced) 4ft. nearer No. 3. Dominant owner wants £100 for the accommodation (it is only a bakehouse). Are the new lights *ancient*, seeing that when the old workshop was removed, ten years ago, and the bakehouse built, he raised the lights in height from 1ft. to 2ft?"

There is no alteration in the statutory period of twenty years required for the acquisition of a right to light. The statutory period of limitation for actions brought for the recovery of possession of land has been reduced from twenty years to twelve, which is probably what T. W. P. has in his mind. The new lights are "ancient" only to whatever extent, if any, they coincide with the old lights—assuming that these old lights were themselves "ancient," in the sense of having been in existence for the statutory period. Any part of a new window which exactly occupies the same position as was occupied by an old window enjoys all the rights of the corresponding part of the old window, but if no part of the new window occupies any part of the space formerly covered by the old one, the new window is wholly a new light.

A. H.

REQUIREMENTS OF PERSPECTIVE ARTISTS.

BRIXTON, S.W.—H. MCR. writes:—"What is the minimum amount of technical knowledge necessary to make an efficient perspective artist, and which is the quickest way of obtaining this?"

It may at once be stated that the minimum in this case is a great deal. The perspective artist must be thoroughly conversant with construction, and, as a proof of this, let him master the rules of perspective (short articles have appeared recently in the BUILDERS' JOURNAL on the subject), which are comparatively simple, and attempt to set up a drawing of some building from the working drawings; and I venture to think he will find himself thoroughly at sea. The best course for H. McR. to pursue will be to go for, say, a year into an architect's office, which, should he possess a knowledge of tracing or drawing, he will be able to do at a small salary. He will in this way become acquainted with working drawings, which is essential. Whilst here, he should study thoroughly the first two volumes of Rivington's "Building Construction," at the same time practising "setting up" perspectives. Then as regards the actual finish of the work. Does H. McR. aim at watercolour or line? Knowledge and proficiency in the former are only gained by constant study from Nature, special attention being given to trees and skies; whilst in the latter, which is somewhat easier, drawing objects direct from Nature with the pen is highly advantageous. A knowledge of the figure is also desirable, as these in a picture give scale and life to it. Should H. McR. be unable to give a year in an architect's office, he would learn much to assist him at the Polytechnic building construction classes. Full information of these may be obtained from the Secretary, Regent Street Polytechnic, W.

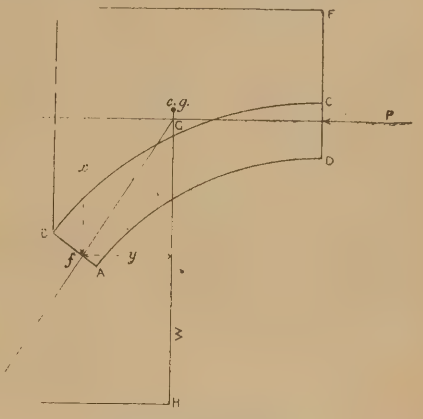
H. F. W.

THRUST OF ARCH.

LOUGHTON.—S. H. J. M. writes:—"Can you tell me how to obtain the overturning thrust of an arch?"

Referring to the accompanying illustration, let A B C D represent half elevation of arch, and B E F C the superstructure and external load in its equivalent of masonry all for one foot run through the arch. Let c.g. be the centre of gravity of the whole mass, including the arch itself; W the load acting through the centre of gravity; P the point of application of the horizontal thrust at crown of arch at outer limit of middle third. Take a point *f* on the skewback A B at inner limit of middle third giving the distances x y from force lines P and W; this point will be the fulcrum and in the probable line of thrust. Then $P\,x = W\,y$, $\therefore \frac{Wy}{x} = P$, which is the amount of overturning thrust acting horizontally through *f*. To find this graphically produce line P to cut line W in G, make G H = whole load W, draw G *f* and produce to I, making H I horizontal; complete the parallelogram by drawing I J, G J, then the thrust G I is the resultant of the thrust G J (P) and load G H (W). The amount of thrust G I in tons divided by the length of skewback A B in feet will give the tons per foot super average pressure, and twice this will give the maximum, which will occur at the springing point.

HENRY ADAMS.



THRUST OF ARCH.

The Roman Catholic Cathedral, Westminster.—This large building is now approaching outward completion. Though the scaffolding still around it prevents one from easily calculating its general effect, it at present certainly gives us the idea (says a contemporary) that it will not be an addition to the architectural beauties of London. Built of red Roman bricks, faced with stone, it looks as gloomy as a cathedral could possibly look. It has no pretence to the grace of Westminster, or the majesty of St. Paul's. It is gigantic, but unlovely.

New Market Hall for Stockton.—The new Market Hall and Corn Exchange, which the Stockton Corporation have decided to erect on the site of the old Shambles in the centre of High Street, will cost £4,446. The ground floor of the new hall will be 114ft. 3in. long by 45ft. wide, being the same width as the present Shambles and 6ft. 3in. longer. There will be space for eighty-five stalls, as against seventy-five at present. By the use of hinged flaps the accommodation can be further increased. On the upper floor will be the Corn Exchange, 102ft. 6in. long by 32ft. wide in the clear, and 43ft. 6in. wide if measured into the recesses between the posts. The whole of the floor space can thus be utilised.

Progress at Newport, Mon.—A Bill which the Corporation propose to put before Parliament next session includes powers for the transporter bridge, electric traction for the tramways, the erection of a lunatic asylum, the taking over of the functions and powers of the Commissioners of Sewers within the borough area, with several etceteras. The owners of the Protheroe estate propose building a suburb at Malpas on the confines of the borough, and negotiations are in progress with reference to a main sewer for the district. The Maindee and adjoining estates are also to be developed for building purposes, and a new main sewer will have to be provided for that district also. An engineer has been appointed to prepare plans and specifications for the raising of the eastern bank of the Usk, so as to prevent a recurrence of the floods which have caused much damage in previous years.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"*The workman of to-day is not the artist as his forefather was, . . . it is the hope of my life that this may one day be changed; that popular art may grow again in our midst; that we may have an architectural style, the growth of its own times, but connected with history.*"—WILLIAM MORRIS.

Our Inset Plates. THE old houses at Aldgate, shown on the left-hand side of one of our inset plates, stand fronting, and, so far as one may judge by appearances, are possibly coeval with, the more celebrated Aldgate pump. They have no historical associations, but are, nevertheless, interesting as uncommonly quaint and picturesque relics of that older London which is fast vanishing. The old houses and shops on the right hand are nearly opposite the Aldgate railway station, and are quainter and of even greater antiquity than the others. Nearly all the shops are and have long been occupied by butchers, and the whole row is commonly known to Londoners as "The Shambles." With regard to the other illustrations on the same sheet, West Walton Church is situated about three miles from Wesbeck, and is chiefly of the Early English period. The piers have detached shafts, and are ornamented with the dog-tooth ornament. The church is noted for its fine carving, the beautiful capitals of stiff leaf foliage being equal to the best work of the period. The font is of later date, being in the Decorated style. The building generally is sadly in need of careful restoration; many of the capitals are cracked and broken, and the marble shafts and mouldings are in a dilapidated condition. The church of St. Wendredra, March, is noted for its very fine open timber roof, which is one of the richest in the eastern counties. It is a double hammer beam roof of the perpendicular period, similar to the one at Knapton Church, but lacking colour decoration. On the ends of the hammer beams are carved figures of angels with outspread wings, and on the corbels a series of canopied figures. The beams are richly moulded, and ornamented with rows of the Tudor flower; the wall plates and purlins have the same enrichment. The church was partly rebuilt in 1528, and was carefully restored in 1875. All the illustrations mentioned above are by Mr. Frederick Adcock, of Hampstead, N.W.

The Convocation House, Oxford. THE Convocation House, built in 1639, forms part of the Bodleian Library buildings and consists of a large hall under that portion of the library in which the books of Seldon are deposited. This hall, part of the woodwork of which we have illustrated in one of our inset plates this week, is used for carrying on the general business of the university, and also for conferring degrees upon those who have satisfied the examiners in the public examinations. The canopied chair shown in the illustration is that used by the vice-chancellor; alongside are arranged the seats of the proctors and doctors, while down the sides of the hall are the benches for the masters of arts. The woodwork throughout is of dark oak, the detail being of bold design and the perspective treatment in the wall panelling having a most pleasing and characteristic effect. Adjoining the hall is the "apodyterium," or unrobing room, in which is held the chancellor's court. The woodwork here, as in the hall, is particularly fine. It is a matter of regret, however, that considerable doubt appears to exist with regard to the designers of this beautiful piece of work. Our illustration is from a measured drawing by Mr. Alfred Greig.

Illicit Commissions. CASES of illicit commissions occur from time to time, and should be given every possible publicity, as this underhand practice is highly deleterious to the architectural profession and requires to be thoroughly stamped out. The most recent instance comes from Birmingham, where attention has been drawn to it by the Birmingham Architectural Association. It appears that a number of local architects have received a letter from a Wolverhampton manufacturing firm in which the following paragraph occurs:—"It is our intention to allow architects a handsome commission on all specifications of our productions." The letter was accompanied by a circular, on which a slip was attached marked: "Private—prices subject to 25 per cent. commission" (not discount). There have already been too many examples to need our pointing out what a mean and sneaking method this is of conducting business.

Fireproofing Floors. THE chief objects in fireproofing, said Mr. J. H. Blakesley, M.A., A.M.I.C.E., at a meeting of the Civil and Mechanical Engineers' Society last Thursday, should be to adapt the protection to the actual needs of the building so as not to increase cost unnecessarily, to avoid thrust on the side walls, and the depth or thickness of the floor, which increases the amount of brickwork in the building; and, lastly, the strength in proportion to the weight of the floor. In most cases the floor between the supporting joists is stronger than the joists themselves, and any great excess of such strength over that of the joists is therefore superfluous. With regard to materials, hydrated cements should be avoided when exposed to very fierce heat, though usually employed where covered by more refractory substances. The advantages of porosity are generally non-conduction of heat and lightness. The disadvantages are the liability to the generation of stresses in the pores when the heated substance is played upon by cold water, and consequent rupture. Maurer's and Wright's bricks are highly porous, and in some cases have shown good results. Coke breeze concrete is of variable fireproofing power according to quality, and some sorts make apparently better fuel than fireproofing material. There is a danger in the best non-conducting substances owing to the stress produced by suddenly cooling the surface, which is likely to cause rupture, and here a hydrated plaster may with advantage be used to protect the principal structure from sudden changes, although not contributing itself to the strength. Fireclay appears to be the best substance for resisting heat, and if properly worked is of considerable strength, as shown by tests made by the author. Nevertheless, those clays which are vitrifiable should be avoided though stronger than others. In the old brick arch system, the chief disadvantage was the exposure of the joists. This is remedied partly by covering those below, which is of unmixed advantage, and partly by separating the joists widely, which increases weight, depth, and thrust, and is therefore partly disadvantageous. Hollow arches decrease the weight, and flat arches the depth, but the latter increase the thrust, and tie rods to counteract this have great disadvantages. Hollow flat arches are of two sorts, the end-pressure system and the side-pressure. The former is the stronger, and has the merit of encasing tie rods, but has disadvantages of erection in practice; side pressure arches are not so strong, but are preferred generally on account of their hollows being parallel to the joists. A great requisite for economy is uniformity of section in the blocks, that they may be made by being squeezed through dies. In America the side and end-pressure systems have been combined. Flat floors are stronger than requisite when in solid slabs, and when hollow in double slabs are otherwise inconvenient. Thin slabs, strengthened with metal and supported on joists far apart and separately cased, have been largely used. Tubular lintel floors have many advantages, being light and strong and protecting inferior concrete laid over them. They are also far more soundproof than solid floors, a great desideratum. They also have some practical disadvantages. Small arched floors get rid of some of these disadvantages, while preserving the main merits of the transverse tubular floor.

£198 for a Church. THIS is the handsome sum which St. Michael's, Bassishaw, in Basinghall Street, realised last week when put up for sale by auction. The church, which was put up in twenty-five lots, is being demolished under the Union of Benefices Act. The bidding was brisk but low, and the total proceeds amounted to just over £198. Two lots, comprising the brick and stone work of the church and tower, were withdrawn. The whole of the lead covering the steeple, the flats, and gutters, fetched £180, while the weather-vane was purchased for £2 15s. Eight ornamental stained-glass windows realised £2 5s., and a large pile of hassocks and a stack of matting were sold for £1 9s. The church perpetuates the name of the ancient Basing family, to whom Henry III. gave the advowson in 1246. It was rebuilt in the seventeenth century, in consequence of the destruction in the Great Fire of London of the older edifice, which had also been rebuilt in the fifteenth century. It measured internally 70ft. in length and 50ft. in breadth, and included two side aisles, which were separated from the nave by Corinthian columns. The tower was at the west end of the church, and consisted of four storeys, and the angles of the parapet were of an ornamental character. Above was a lead-covered octagonal lantern in two stages, surmounted by a short spire, culminating in ball, finial, and vane. The total height was 140ft. An attempt was made in 1892 to remove the numerous bodies which had been interred beneath the church, but it was found that that could not be done without great danger of the whole building giving way, and the church was closed by an order in council on account of its insanitary condition. The only remedy then was to unite the parish to those of St. Lawrence, Jewry, and St. Mary Magdalene, Milk Street, and a commission which was appointed to consider this scheme reported in favour of the union in February, 1894, and it was subsequently approved by the Queen. The parish of St. Lawrence, Jewry, to which St. Michael's has been added, was occupied by the Jews up to the time of their expulsion from England by Edward I. Both the original edifice and that of St. Mary Magdalene, Milk Street, were consumed by the Great Fire. The existing edifice was built in 1671, from the designs of Sir Christopher Wren.

An Unprotected Treasure. STRATFORD-ON-AVON would do well to buy a modern fire-engine. While there is no cause to be alarmed about any immediate danger to the national possessions in the town, a few facts with reference to what happened a week or so ago will make it apparent that some more efficient precautions ought to be taken to prevent our losing those buildings which are so closely connected with the greatest genius that the world has ever seen. A short time ago Messrs. Flower and Sons' brewery at Stratford was destroyed by fire. The local brigade was helpless, and steamers from Leamington and Warwick had to be summoned by telegraph, while the pressure in the water mains was feeble, and therefore insufficient. No grate fires are lighted at the Birthplace or in the Museum and Theatre, and New Place, already once demolished, has little of Shakespeare's building left to boast of. It is particularly with regard to Anne Hathaway's cottage that some anxiety is felt. This, as everyone knows, is a half-timbered thatched cottage, but ordinary fires are still burned in it. In a house of this kind the flames would very soon get a good hold, and, unless some efficient means for extinguishing them were at hand, it is very probable that the world-renowned cottage would cease to attract its yearly hoards of sightseers. Rightly or wrongly, the place is associated once for all in the public mind with Anne Hathaway, and it would therefore be a good investment if the Stratford authorities purchased a steamer of their own.

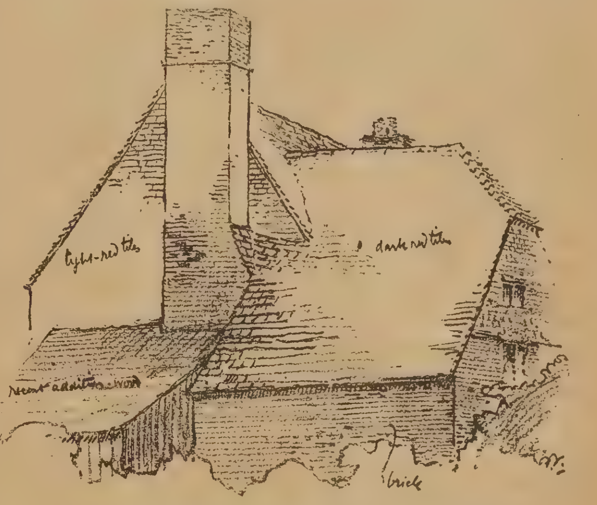
Albert Dürer. In the fourth of the series of fortnightly lectures on art subjects in the Glasgow Corporation Galleries, recently delivered at Glasgow, the Rev. John Macartney Wilson said that Dürer was no preacher, but an artist, and his aim was to reveal beauty to men—the beauty of line and colour, of light and shade, of the human form and face, of tree and flower and fair landscape, and even of the grotesque. But all that he did was the outcome of a beautiful soul, and was transfigured with spiritual light. It carried an unconscious message. In Dürer's day feudalism was passing away, but the artist loved to depict its finest produce, the "verray perfect gentil knight." Her old supremacy was being wrested from the Roman Catholic Church, and Dürer showed the wearers of tiara and mitre swallowed by the jaws of death; but he also loved to dwell on the figure of the simple and studious monk, and again and again with loving care depicted the figure of the Virgin, who was his ideal of a high and perfect womanhood. He was touched by the Renaissance, on which he passed the profound judgment of the "Melancolia," a pictorial embodiment of the Faust legend. Against this might be set the picture of the student of Divine things, St. Jerome, warm in the sunshine and happy over his books. He showed us the spirit of the Reformation in "The Knight," who scorns death and the devil and seems to sing Luther's hymn, "Ein Feste Burg"; also in his loving and reverent studies from the life and passion of Our Lord. In all these works he had taught the lesson of faith and hope and courage, not only to contemporaries, but to men of every age. The lecture, which was illustrated with a fine series of slides of Dürer's principal engravings, was listened to with marked attention by a large audience, and at the close, on the motion of the Lord Provost, a hearty vote of thanks was awarded to Mr. Wilson.

The Bloody Tower. The famous Bloody Tower in the Tower of London is being repaired. The upper portion of it, which faces Traitor's Gate, has been refaced in parts, pointed, and coloured to resemble age. The building is to be restored all round. Chalk, in large blocks, enters largely into the composition of the inner parts of the walls, and is declared by the masons to be as hard, if not harder, than ever it was. Some parts of the wall by the Tower are 14ft. thick. The greater part of the outer surface of the Bloody Tower, like that of the Bell Tower and some others, has, since the year 1832, been plastered over at various times with Roman cement, into which shallow portions of flint have been superficially embedded. This was in rough imitation of the old solid flint work of ancient times, which actually formed parts of walls, and is seen in perfection in St. Saviour's, Southwark; but as it was calculated to deceive, and become dangerous through its rottenness—the flints falling, and so on—it was all removed. The lower portion of the Tower, built of square blocks of Ashlar stone, has had a lot of superfluous Roman cement stripped from it, and looks somewhat incongruous in comparison with the upper part, which is of the irregular order of masonry; but that is unavoidable, and may in a measure yet be remedied.

Former Restorations. Restorations and repairs have often been carelessly done in much earlier years. For instance, the doorway that led from Raleigh's Walk directly to the room in the Bloody Tower in which the infant princes were supposed to have been murdered had been bricked up from the inside to give support to a portion of the Tower. This has all been removed, and the Tower strengthened in a more reverential way. The old oak door, with its heavy fastenings, which had been covered by the wall, now lies on its side on the wall, and when the rottenness at the bottom is repaired, is to be restored to its place. It was through this doorway that Dighton, Forrest, and Tyrell are said to have passed to their fearful work. Raleigh, Cranmer, and Ridley have certainly passed through it when prisoners here in the Tower, and Cranmer often, when he daily took his dinner with the lieutenant of the fortress. So say the authorities. Portions of the old houses which are to be seen above that part of the battlements known as Queen Elizabeth's Walk, which connects the Bell and Beauchamp Towers, are also undergoing restoration. It is said that Queen Elizabeth used this walk when she was a prisoner in the Bell Tower, hence its name. The old houses had sunk quite 15in., and had to be raised to their proper height by hydraulic means. Had they not been seen to in time, they would in all probability have tumbled down, and buried the esteemed lieutenant of the Tower, who lodges in them, in their ruins.

St. George's Church Tower, Liverpool. Sir Thomas Hughes, we should have thought, would have refrained from again bringing himself to the fore in championing the wrong side over the matter of the destruction or retention of St. George's Church Tower, that distinguishing mark of Liverpool. It will be remembered that this matter came before the Council some months ago, when it was thought that until the body of the church was demolished it would not be possible to form an adequate opinion as to whether it was worth while to retain the tower and spire as objects of architectural interest. For some months the site was in the possession of a contractor, acting under the Bishop of Liverpool's Committee, the Corporation being entitled under Act of Parliament to possession on July 15th last. The Finance Committee, having asked for the temporary retention of the tower and spire, showed a certain amount of indulgence to the contractor, but as he seemed to be making rather too long a use of the site as a place of sale for the material, the town clerk took possession on behalf of the committee, with the building in its present partially demolished condition. In moving the adoption of the Committee's report, Sir Thomas thought the body of the church had been sufficiently demolished to enable everybody to form an opinion as to whether it was desirable to leave the tower and spire standing, and the Finance Committee had come to the conclusion to recommend the total removal of the edifice. While there was, some months ago, considerable public opinion in favour of the retention of the tower and spire, now that the body of the church had been removed a very large number of those who originally supported the retention had altered their opinion. That was a change of opinion shared by some of the architects of the city. He knew there was still a remnant of those who believed it would be what they called "vandalism" to destroy this interesting structure, but he, for one, had been unable to discover its alleged architectural advantages to the port of Liverpool. While he might be charged with taking an utilitarian rather than a sentimental view, he reminded the Council that the site was valuable, while the surveyor, in an up-to-date estimate, stated that it would cost from £1,500 to £2,000 in order to make the tower presentable, besides which there would be continued expense of maintenance. The Finance Committee thought it would be wise to clear away the whole structure, and he might add that six months would be required to safely effect the clearance. It was entirely a matter of sentiment whether the Council would retain the structure or vote for its removal, as the Finance Committee, with only two dissentients, had recommended.

In Aid of Retention. Alderman Radcliffe sensibly pointed out that it was not fair for any member to judge of the tower in its present unfortunate state. He thought it would cost about £500 to pull down the tower and spire, but he could not think for a moment that so much as £2,000 would be required to face the eastern side of it, because they already had an abundant supply of suitable stone for the purpose. He moved as an amendment—"That the question of the demolition of St. George's tower and spire be postponed, and that the surveyor be directed to report to the Finance Committee the probable cost of pulling down the tower and spire, and also the probable cost of facing the eastern side of the tower, and prepare a design to show how the structure may best be adapted for a useful purpose." Sir William Forwood, in seconding the amendment, said the tower and spire ought to be retained as an attractive feature in the architecture of Liverpool. He looked affectionately upon the structure as associated with his boyhood and manhood, and as marking the site of the old castle of Liverpool. Mr. Willink said while he knew that one architect was in favour of the demolition of the tower and spire, he was not aware of any change of opinion on the part of the members of the Architectural Society and the Society of Arts, who favoured the retention. He had not changed his own mind, and while there was no official scheme for the utilisation of the structure, there were private schemes showing how the tower could be adapted for both useful and decorative purposes. He should feel very much the loss of this tower to Liverpool. In reply, Sir Thomas Hughes said the amendment only asked for information already before the Council. Anyone who wanted to get an honest opinion of what the tower, if left standing, would look like, could obtain it by the present view. It was no part of the instructions of the Finance Committee to produce plans for the future use of the site.—The amendment was rejected by fifty-eight votes to forty-three, and there is still hope that better counsels will prevail to have the tower retained.



COTTAGE BETWEEN TONBRIDGE AND HADLOW.
DRAWN BY FRANK LISHMAN.

Designing for the Country. In designing for the country one of the most difficult points to succeed in is to make the building fit the site—to make it "sit" well. And whether it be for the squire's mansion or the labourer's cottage, the village inn or the village church, no more suggestive or instructive district to help us in this particular can be found than the stretch of country lying more or less between Maidstone, in Kent, and East Grinstead, in Sussex. The roadside cottage with its oast-house, met with hereabouts, forms as essential a feature in the landscape as the orchard or the hopfield; they appear to have grown with everything around them, making it almost impossible to separate the one from the other in the mind's eye. There is, doubtless, a charm and fascination in the natural colouring of the materials employed: the browns, reds, purples, and yellows of the bricks and tiles; the silver grey of the oak framing, weather boarding, and shingling; with the plaster — either rough or smooth — which seems to contain, in the most delicate hues, all the tints to be observed in the more permanent materials. The smallness of the bricks with the wide mortar joints used in setting them also assist the scale and add to the texture of, and interest in, the wall surfaces; this being emphasised by contrast with the comparatively wide-coursed and smooth appearance of the vertical tiling where it is employed. Notwithstanding the great loss of charm of colour and material in the pencil sketches by Mr. Frank Lishman, A.R.I.B.A., illustrated on the previous page and in one of our centre plates, they serve to show where the success lies in these representative buildings—this will usually be found in the lines of the roof and in the position of the chimney or chimneys. If, in the designing of our present-day houses, the position of the chimney were only more considered we should have more pleasure in viewing the houses, and probably enjoy a greater amount of comfort in occupying them. To design the roof is to design the house, for the roof cannot be considered without the chimneys, nor the chimneys without the fireplaces, and a house cannot be called a home unless the fireside be inviting and free from draughts and other inconveniences of bad planning and construction. Under ordinary circumstances, given a well-designed roof, the success of the whole is practically ensured. The exigencies of the site and its surroundings should therefore be well considered—shown by the appreciation of a fine tree, or a group of trees, for instance—and advantage taken of any rise or fall of the ground. The cottage illustrated in the inset sheet is situated a short distance out of Penshurst, to the westward, and the chief feature in its design is the splendid chimney. The arrangement of the lighting of the first floor is very successfully treated, whether considered from the outside or from the inside; and the colour result is good, the stone and brick being well disposed in the lower part of the chimney stack—the tile hanging, plaster and shingles, doing their work in the gable and elsewhere. The sketches were made in 1892.

Concrete Cottages. People have been waking up to the fact lately that the country has its housing problem as well as the town, and it is interesting in this respect to refer to the correspondence that has been going on in the "Spectator." Mr. J. Boyd Kinnear supports the use of concrete as a cheap and useful material for cottage building, and he points out that the cost of a pair of cottages with two living rooms, three bedrooms, scullery, washhouse, and all complete is £254, while dwellings with less accommodation and of plainer construction could be built in pairs or a row for less. The housing problem in the country is purely a matter of rent, and while the labourer must have a healthy house to live in the landlord receives such little rent that he cannot afford to build one. In the north of England and Scotland from 18s. to 22s. a week with a good house and garden rent free keeps the labourer on the land, in spite of the attractions of manufacturing towns, while 14s. a week, with 2s. to pay for rent, drives the young men into the towns in the South country. To make farming pay the labour must be good, and in the South of England the farmers often complain that the men are not worth the wages they get. In agriculture as in everything else low wages mean poor work, and if the wider introduction of concrete as building material leads to better cottages being erected, something will have been done towards inducing the labourer to remain on the land. It is an unfortunate fact that so many flock from the country into the town where they only serve to swell the already serried ranks—if not of the unemployed, then of the hum-drums.

Views and Reviews.

A CATALOGUE OF PAINTINGS.

This catalogue is a distinctly valuable one. It is neatly got up on good paper, and has a large number of illustrations. The catalogue is arranged alphabetically under the painters' names, so as always to be of use, notwithstanding any change in the position of any of the pictures. Mr. Whitworth Wallis, F.S.A., the keeper of the Museum and Art Gallery, and Mr. Arthur B. Chamberlain, his assistant, who compiled the catalogue, have greatly added to its interest by giving biographical notes of each of the painters, and descriptive notes of the exhibits. The collection is rich in paintings of architectural interest, and the Pre-Raphaelites are well represented.

"City of Birmingham Museum and Art Gallery: Illustrated Catalogue (with descriptive notes) of the permanent Collection of Paintings in Oil and Water-Colours, and the Collection of Statuary and the Pictures at Aston Hall." Compiled by Whitworth Wallis and Arthur Bensley Chamberlain. Price 6d. Guild Press, Birmingham.

COLOSSAL STRUCTURES.

The author of this book has done wisely to state in his preface that he has no intention of placing before his readers a technical review of the progress of mechanical science during the present century, but that he simply aims at giving a popular *résumé* of those inventions and processes which have attracted the most attention. Otherwise, criticism might be more severe, for the difficulty of dealing with technical subjects so as to be intelligible to the ordinary person is one which, unfortunately, is very often ignored, with the result that statements are made which are quite inaccurate, superfluous or absurd. Though the range of subjects includes much that is quite outside the sphere of architecture or building, the book contains several chapters which would be of interest to our readers. The first chapter in the book, for instance deals with big business buildings. Though of late years we have been inundated with particulars of the "skyscraper," there are many details—practical details—given which few, outside American professional circles, would probably be acquainted with. In calculating the strains on tall buildings, wind pressure becomes an important item. If the building is more than 200ft. high and rather narrow, it is deemed safe to allow for a possible wind pressure of 30lbs. to the foot; if there is a tower or finial running still higher, an allowance of 50lbs. per square foot is made. To meet this pressure, angle-braces are put in, or extra wide plate girders are used at different points to stiffen the steel frame which constitutes the skeleton of the building. It will be remembered in connection with the recent fire at Hyde Park Mansions, that considerable difficulty was experienced with the water supply, which, as the outbreak was at the top of the building, was found to be inadequate. When it is considered that a building like this is quite a low one compared with one of the big American structures, it will at once be seen that special arrangements of an intricate character are needed for the supply of water to the latter. As the city mains are designed to supply only about four storeys, large tanks are provided in the roof so that the tenants may not experience annoyance by reason of freezing or overflowing. To avoid the first danger the tanks are surrounded by an attic connected with the top of the lift well, so that the spare heat of the building always collects around them. The danger of flooding is avoided by using curved connections, and by placing pipes away from the wall whenever possible. Mr. Cochrane says that it is possible to put up one of these colossal twenty-storey buildings within a twelvemonth, and, as a comparison, mentions that the dome of St. Peters, at Rome, took a hundred years to complete. The most tedious delay is that caused by waiting for the plaster to dry, as the partitions are made of hollow bricks, irregular in size, and these are laid level on one face and brought up true with plaster on the other, a coat of an inch or more being required in some parts.

Have we yet reached the uttermost limit to which the "skyscraper" can safely be built? By no means, says our author:—"It is difficult to form an opinion as to how much higher the big buildings of the future may rise, but it may be safely estimated that thirty, or even forty-storey buildings are to be expected within a score of years, and that it is mechanically possible to erect steel buildings a fifth of a mile in height, the only serious objection being the cost." The advantages of living at this height are very doubtful, and from an æsthetic point of view the prospect is an appalling one.

The largest completed bridge in the world is the Forth Bridge. As it is usual for our American friends "to go one better," it is not very alarming to hear that the great Scotch bridge is to be surpassed by the bridge planned to cross the Hudson at New York City with a single span, connecting the States of New York and New Jersey. This monolith, of which "there appears to be no doubt that it will be begun at an early date," will be of the suspension type, the clear span being 150ft. in height and 3,110ft. (nearly two thirds of a mile) in length. This is almost double the span of the Forth Bridge. The building of bridges is undoubtedly on the increase, and the author is of opinion that spans one mile long may be expected. The chapters on tunnels, canals, electric traction and gas manufacture are interesting, and the information, as a whole, is presented in a very readable and agreeable form. The book is well printed and profusely illustrated.

The title is, however, distinctly a bad one as it at once suggests a "wonderful" volume of that class usually presented to the good boy at the local school, or that which the proud parent buys for the development of his "really astounding" son—whose talent for engineering, though like an oasis in the desert, is such that the universe will no doubt hear of the amazing devices which are its only possible outcome. Besides, how such subjects as building can be included under the term "mechanism" is a mystery. R R. P.

"The Wonders of Modern Mechanism." By C. H. Cochrane. J. B. Lippincott Company, London. 6s.

For Electric Lighting at Salford the Corporation have made application to the Local Government Board for permission to borrow £398,683.

The Paris Underground Railway, when completed, will have twenty-three stations within a radius of about ten miles. It will not be open for its whole length in time for the opening of the Exhibition.

Stepney Parish Church, E., has been restored at a cost of about £4,000. A new side chapel has been erected, the galleries have been removed, the seats have been restored, and a new wooden floor has been put down. The bells have been rehung, the tower repaired, and the organ has been restored. During the progess of the restoration it was found that much good stonework remained in the walls, especially round the arches, which have hitherto been covered with plaster. This has now been removed, and the stonework exposed.

Bath Abbey Restoration.—At a meeting of the Executive Committee held at Bath Guildhall on December 7th, under the chairmanship of the Archdeacon of Bath, Mr. T. G. Jackson, R.A., the architect, was authorised to proceed with such work on the west front and other portions of the fabric as the committee felt justified in undertaking. It was announced that Mr. John P. Carrington, a native of Bath, now residing in London, had communicated with the architect his desire to have some part of the restoration done at his own expense, and he had expressed his willingness to undertake the cost of the carved canopies over the Apostles St. Peter and St. Paul at the west front. The cost is worked out at about £150.

CEILINGS.*

By L. A. SHUFFREY.

At the beginning of this paper the author explained that the early date which had been fixed for the reading of his paper had made it necessary for him to make use of such illustrations as he could procure in the time, and apply his remarks to them, although in some instances they were not the most suitable examples for his purpose. He was fortunate in being able to exhibit and refer to the fine illustrations of the later Renaissance period from Messrs. Belcher and Macartney's book. He reviewed the progress of ceilings in this country from the time of the introduction of the Italians by Henry VIII., referring to the ceiling of Bishop West's chapel in Ely Cathedral, which is quite Italian in the style of its ornamentation, although not far removed from British examples in its plan, also to the ceiling of Wolsey's closet at Hampton Court. The latter has wood ribs, with cast panels said to be of lead, the ornament of which is in the Cinque Cento style and gilt on a blue ground. It is formed of interlacing octagons with small bosses and cut leaves at the intersections of the ribs; the whole is small in scale, and on two sides of the room there is a frieze cut up into long and short panels, with ornament of the same character and a moulding beneath it on which in gold lettering is a Latin inscription.

In Henry VIII.'s great Watching Chamber the ceiling is of oak ribs deeply moulded, forming a star pattern with pendants, and the panels are of plaster with shields and badges in circular wreaths of Renaissance character. Although plaster was freely used during the Gothic period for plain surfaces, or in combination with wood ribs, as in the last-named example, he did not know of any ornamental plaster ceiling of entirely Gothic character. The late Mr. G. T. Robinson, in his introduction to Mr. Millar's book on plasterwork, says that a guild of plasterers was founded by Henry VIII. in 1501, and that Luca and Bartholomew Penni, Italian plasterers, were brought over by Henry VIII. to work at his palace of Nonsuch, and this introduction of the Italians appears to have given an impetus to the craft. This fan type of ceiling, probably suggested by the late Gothic fan vaulting, an example of which was close at hand in the Great Hall, became very general, being found as far north as Sizergh Castle in Cumberland, and a variation of it at Levens Hall, the oak rib being superseded by one of plaster. The date given in Mr. Law's book on Hampton Court of the great Watching Chamber is 1536.

Another type of plaster ceiling exists in a very dilapidated building at the back of St. Aldate's, Oxford, where it is divided into four compartments by cross beams cased with plaster mouldings, the soffits of beams having a very flat, ornamented waving band running each way from a terminal in the centre. The compartments are cut up by ribs 2½in. wide, and ornamented with flowers in the spaces. In the upper chamber of this building the roof truss, which in the ordinary way shows beneath the flat and pitched ceilings, is also cased with plaster ornament.

At Burford Priory, also in Oxfordshire, we again have the fan shape with pendants, but the rib has become wider, 6½in., and has a running vine ornament between the beads. The pattern repeats all over a large room with fearful regularity, and the cornice is a rude attempt to adopt the imported style. In the ceiling from the Reindeer Inn at Banbury we find a further development, the planning of the ribs is more complex and the ornament on both ribs and spaces better modelled and more in the foreign manner. In this room the wainscotting goes up to the ceiling with cornice of wood.

Elizabethan Ceilings.

During the time of Elizabeth and James I., ceilings showed the Dutch and German influence in their strapwork and shields. Examples might be seen from Audley End, Blickling Hall and Barnstaple, the last place being rich in examples, and giving the impression that it was an important centre of the craft at that time. In the fish ceiling at Audley End we see the pendants exaggerated to quite an alarming extent, and the details of a very mixed character. Elizabethan ceilings are given in Mr. Gotch's book from Broughton Castle, Canons Ashby, Chastleton, Charlton House, Wilts, Haddon Hall, Knole, and others, showing that a British school of plasterers had developed a style peculiar to this country.

In the examples referred to it will be noticed how much better is the effect produced by bringing the plasterwork down the walls in the form of cornice and frieze, as in the examples from Charlton and Audley End, rather than starting it horizontally from the ceiling.

This work, when closely examined, is found to be very rough in execution, and even allowing for successive coats of distemper, appears to have been so when executed. To attempt to copy this rudeness now is mere affectation, but by studying the old work much may be learnt as to variation of surface, and the way in which the ornament dies into the ground tending to produce that softness of effect which is so pleasing in the work of this period. The repeating network all over the ceiling has a rhythmic value, and assists production when cast from a mould, and variation can be procured by changing of centres or joining pieces.

Over the staircase at Burford Priory the ceiling shows a great change, both in design and execution. The design embraces the whole space in one composition and the ornament is all undercut, the mouldings are foreign, and the acanthus leaf is introduced with shells in the cornice. Probably the design was supplied by the architect in this case, and in the earlier examples the craftsman may have been responsible for both design and execution. In the church of St. Charles the Martyr, Tunbridge Wells, is a singular ceiling, dated 1690, composed of square panels, octagon coffers, and small saucer-shaped domes, and at Burwash, in the same district, another, dated 1699, both showing a considerable acquaintance with natural forms and an endeavour to represent them literally. The ceiling at Thorpe Hall, designed by Webb, is a fine example of broad handling, with bold yet restrained ornamentation, and within the legitimate possibilities of plaster work. The staircase ceiling at Ashburnham House, Westminster, and that of the saloon at Coleshill, both by Inigo Jones, are of the same general design, consisting of a large central ellipse bounded by a heavy band of fruit and flowers, lying on, but overlapping at the sides, the main rectangular compartment. The example from Coleshill appears too large in scale for the room, and the cartouches and swags in the frieze quite unsuitable for plasterwork. The development of this class of ceiling can be seen in illustrations from Belton House, Melton Constable, Eltham, and Groombridge, the foliated band in the last getting quite out of bounds and disfiguring what would otherwise be a fine ceiling. In comparing these ceilings it is well to note the various ways in which they leave the walls where the cornice of room forms part of the wainscotting, as at Thorpe and Groombridge; the effect is not so good as where the ceiling is brought down to the walls with a plaster cornice or cove, as at Melton Constable or Belton. It must be remembered that in some cases the plasterers were working by the side of Grinling Gibbons or his school, and were not unnaturally led away from the paths of virtue by the flowers and festoons which they saw around them. During Wren's time

Plaster Ceilings

were influenced very much by French work, and later, with some exceptions, lost their architectural character and became a field of meandering scrolls without any geometrical forms to hold them together, until about the middle of the eighteenth century a new departure was made by the brothers Adam, who introduced a new style and a new process. The style was founded on the Greco-Roman, and the process was the use of a composition for the ornamental portions instead of plaster of Paris. This being pressed into hard wood or metal moulds whilst hot was capable of producing the very thin ornament which we know as the Adam style, and was applied to woodwork as well as ceilings. In

Adam Work

the dividing up of the ceilings was generally satisfactory and the ornament not often overdone, plenty of plain ground showing; they also showed originality in the form of their ceilings, being very partial to the segmental arched form, and a desire to get away from the flat ceiling, which we might very well copy. The style may be suitably used for low or small rooms. The publication of the antiquities of Greece by Stuart and Revett was followed by ponderous ceilings of beams and coffers and highly-relieved pateræ, and in less important work by Greek cornices, with refined egg and dart, and honeysuckle ornaments, bringing us well into this century, and leaving us the plasterwork of the speculative builder as our only evidence of tradition.

We have hacked down the work of the speculative builder, and in its place are content with an architectural void, a blank area. Having taken this rough survey of ceilings from the time of Henry VIII., it would be well to consider how we can profit by this wealth of work left us by our forefathers.

Hints on Designing Ceilings.

In many cases expense prevents the use of ornamental ceilings, but surely there is some way of giving expression to the ceiling without elaboration. Remember that ceilings have to be viewed foreshortened, and ornament should be simple on that account, and as the light strikes them very horizontally slight relief will tell. Undercutting is not necessary, and rather takes away from the solidity of the work. As a ceiling can only be examined by the spectator bending his neck, elaborate subjects, or what may be termed high art, are out of place. The general contour of a ceiling should be arched, and this can be done by keeping the cornice as low down as the height of windows will permit, and rising with ascending mouldings or a cove to the highest plane in the centre. A coved ceiling is ineffective mitred four ways, unless ribs are introduced to show its form, but running the barrel shape through at each end has a good appearance and gives a good place in the end spandrils for ornament.

Groining the ceilings of passages and lobbies is most effective, as is seen in some of the town houses of the last century. If figures are introduced their heads should point to the centre of the ceiling. It frequently happens in planning that small rooms have to be made unduly high for floors above to range with those over larger rooms. This is a good opportunity for keeping the cornice of room low and giving the rest to the ceiling, and the proportion of the room is much improved thereby.

Whilst not wishing to see all ceilings elaborated, we should look to it that they are ornamental in that they complete the architectural expression of rooms of which they become the crowning feature.

Improvements at Elland.—The Elland District Council propose to borrow £1,168 for sewage disposal purposes, in addition to the £13,000 previously sanctioned, and £2,260 for the improvement of footpaths. An inquiry has been held.

A Parish Room at St. Mary's, Colchester, has been erected in Papillon Road from the designs of Mr. J. W. Start. The site measures 110ft. by 52ft., and the building contains a room 45ft. by 25ft., a class room 18ft. by 25ft., and a lobby 8ft. by 25ft., leaving room for further extension of the premises in the future. The building, which is constructed of red brick faced with Bath stone, is well ventilated and lighted, artificial light being supplied by a number of electroliers, presented by an anonymous donor.

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* Resumé of a paper read before the Liverpool Architectural Society on December 4th, 1899.

Professional Practice.

Greenock.—A cinerarium has just been erected in Greenock Cemetery as a memorial to the late Lady Francis Caroline Cameron, whose death occurred at Balclutha in January last, by her husband Sir Charles Cameron, Bart., M.P. The mausoleum, which has its foundation on solid rock, occupies a commanding situation in the cemetery, standing in the higher portion of the ground, and only a short distance from the western entrance at Forsyth Street. It takes the form of a Greek temple and is built of white Carrara marble, the blocks of which were cut out and fitted at the quarries in Italy. The cinerarium is 15ft. high, 15ft. long and 12ft. wide, and the marble employed in its construction weighs 44 tons. An oval grass plot and a walk will surround the monument, entrance to which will be obtained by a little gate. The memorial is approached by steps entering under a porch supported by pillars and leading up to a door in heavy ornamental bronze. Sir Charles intends that the cinerarium shall henceforth be used as a family vault. The architect of the structure is Signor Paciarelli, of Florence, and the contractor is Mr. Alex. Amidei, importer of Italian objects of art, 20, Queen Victoria Street, and Fenchurch Street, London. Signor Paciarelli has a wide reputation as a distinguished architect, and is one of the most noted members of his profession in Italy. Among the many notable erections designed by him may be mentioned the Castle Mediovale in Lucca, and the funeral vault Pantillina in Petersburg, built for His Excellency Pelostotosky. This latter work was this year awarded first prize at Monsa in the competition annually promoted by the King of Italy and open to European architects, the monument securing the distinction of being the best one of the year. Signor Paciarelli has also designed many private residences of note, among which is the villa in Florence for the Count Hochberg.

London. — Messrs. Tillett and Yeoman, architects, surveyors and estate agents, of 32, Finsbury Pavement, recently sued Mr. Thomas A. Sharp for £14 14s. for professional services rendered. Mr. Thomas Tillett, a member of the plaintiff firm, said that in the beginning of the year they were applied to by the defendant to investigate the stoppage of drains on the defendant's premises. An inspection of the drains was made, and the charge of £14 14s. for almost daily superintending the work in progress was fair and reasonable. Under the scale allowed by the Institute an architect could charge by time upon small jobs. In the present case he had charged the defendant by time. It was not customary for the architect to inform the client when work was charged for by time and when by percentage. For the defendant, Mr. A. M. Hiscocks, civil engineer to St. George's Vestry, Southwark, said that the ordinary percentage in the scale of charges was the usual charge for drainage work. In the event of finding that such a scale did not pay for a particular job he should inform the person employing him that he would charge him differently. Upon examining the plaintiff's account he should think that a sum of £5 5s. would be sufficient for the work done. In addressing the jury, defendant's counsel said that his client had refused to pay the account because of the manner in which it had been made out. He had been charged 17 per cent. or 18 per cent. upon the total value of the work done. There was also an item which he (counsel) would draw the attention of the jury to. The item appeared after all the work was done, and was as follows: "To writing to Sharp as to the future use of the drains, and enclosing our account, 10s. 6d." The jury could not agree, but the parties agreed to accept the verdict of the majority, who found that the plaintiffs were entitled to be remunerated under the 10 per cent. scale. Judgment was entered for the plaintiffs for £8 14s.—On December 5th, in the High Court, Mr. G. G. Pye, an architect, sued Mr. C. H. Fry for £188, the balance of fees in respect of preparing plans for the rebuilding of the Gresham Restaurant in Gresham Street, of which the defendant was the proprietor in 1897. Being desirous of rebuilding, the defendant was introduced to the plaintiff and instructed him to prepare the plans. The defendant desired to raise about £15,000 upon the premises in order to pay off £6,500 already secured upon them, and to meet the expense of the new buildings and other expenses. According to the plaintiff's case, the defendant asked him to procure loans of £10,000 and £5000, to be charged as a first and second mortgage respectively on the premises. The plaintiff introduced the matter to Messrs. Bass and Co., but the negotiations fell through owing, as the plaintiff contended, to the fault of the defendant in not complying with that firm's reasonable requirements. The plaintiff, in addition, found successively three other persons who were prepared to advance the £10,000, but the negotiations failed, and the defendant ultimately sold the premises as they stood for £8,000. The defendant's case was that it was agreed between them that the plaintiff should only be entitled to be paid his fees if he succeeded in procuring the loan of £15,000. The jury found for the plaintiff, and judgment was given accordingly.

New Patents.

These patents are open to opposition until January 15th.

Utilising Sewage.—23,562. W. R. Hutton, junr., Whiteinch. The dried sewage is fed into a retort. The char or coke is recovered at the bottom, as residual products, while the volatile products are carried away and treated for use as illuminating gas, or for the recovery tar, oil, or ammonia.

Drying Bricks.—24,188. M. Villaret and J. B. Wahlen; both of Germany. To prevent cracking, air is first let in at a low temperature and containing a certain moisture. Then the heat is raised gradually until the air current is perfectly dry and of the highest temperature. The drying room is specially arranged to effect this result.

Brick Making.—27,173. J. Rowe, London. To prevent shrinkage, an oxide from which sulphur has been taken for manufacturing purposes is added to river mud or clay, and, if desired, sand may be incorporated, though in this case the quantity of oxide is reduced. About equal quantities of mud and oxide are used.

Floats.—27,396. J. Wellard, Grays. In ordinary ball floats two hemispherical cups are soldered together and, owing to immersion, the solder is subject to galvanic or corrosive action. To prevent this the float consists of a hollow vertical cylinder having a hemispherical bottom and a flat cover soldered on—the joint being clear of the water.

1899.—Attaching Door Knobs.—1,178. A. Ashworth, Eccles. The spindle is drilled in the end and tapped to receive a screw which is inserted after the knob has been put on. The spindle is square. In a modification it is tapped on the outside, and the screw has a thread inside. In another modification both methods are employed.

Protective Coverings.—J. C. Sellars, Birkenhead. For preventing corrosion or damage from heat or water, metal surfaces, such as iron or steel, are first brushed over with a suitable cement, applied like paint. When this is dry a paint consisting of pigment and a mild adhesive (milk, glue solution or albumen) is applied. Lastly, a covering of silicate of soda or potash is put on. Sometimes this is covered with vaseline, paraffin wax, black varnish, &c. Several modifications are included in the invention.

Drawing Curves.—6,306. Dr. L. Cerebotani, Munich, Germany. This invention relates to an elaborate machine, consisting chiefly of two bars turned on a common axis and having longitudinal motion regulated by rack and pinion, for drawing all sorts of curves and spirals. It is operated by a handle working through gearing. The device is too intricate to describe here.

Lustreless Paints. — 11,957. A. Turski, Warsaw, Poland. To ordinary oil colour is added about 30 per cent. of powdered kaolin and about 25 per cent. of purified oil of turpentine. This produces a paint which, when applied, dries with a perfectly matt surface.

Joints without Solder.—14,546. F. G. S. Ham, London, S.W. The end of the soft metal pipe is splayed and fitted with a tapered or corrugated ferrule inside. Outside is another ferrule, which may or may not be threaded, held in place by a screw collar. Packing washers are provided in some cases, and the end of the pipe is burred over to form close joints. No solder is needed.

Light Refractors.—16,623. C. E. Manning, Chicago, U.S.A. The frame of the skylight or window is of wood, and is filled with rectangular strips of glass placed slanting downwards. Instead of grinding the edges, powdered glass is sprinkled over and melted there, so that the surface on each side is quite smooth. Sometimes the glass strips are placed horizontally one above the other, with the edges rough; a soluble glass is then applied.

Fastening Pipes to Walls.—18,407. E. M. Edwards, Stratford, Essex. Cast on or attached to the back of the pipe is a projection having splayed sides. This fits into a correspondingly recessed projection on a back plate, which is fastened to the wall in the usual way. The pipe is given a turn to lock the joint, and is held in place by a pin.

Artificial Stone, Bricks, &c.—20,139. A. Catkosinski and L. Weintraub; both of Germany. Two parts of hydraulic cement and about four parts of coal waste or slack are mixed together and moistened with water; the mixture is then compressed in moulds. The material is very light, and is a bad conductor of heat.

The following specifications were published on Saturday last, and are open to opposition until January 22nd. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—17,696, Swan, kilns for burning cement-making materials. 17,758, Weiss (*Preble*), automatic lathes or machines for turning or shaping wood, &c. 24,086, Laffan and Bury, production of marbled surfaces on glass, &c. 24,145, Puddephatt, apparatus for raising, lowering, and traversing or transporting loads. 24,211, East Ferry Road Engineering Works Co., Ltd., Tuckett, Locke, Lancaster, and W. W. and R. Johnson and Sons, Ltd., and Johnson, means for drying white lead. 25,876, Restall, apparatus for cleaning and repairing drain pipes. 26,097, Restall, apparatus for cleaning, painting, and repairing the interior of drain pipes or conduits. 26,562, Jensen (*Kemlo*), wire ropeways. 27,107, Atkin, construction of cutter blocks for wood working machinery. 27,118, Ingham, waterproof material for bridges, viaducts, flat roofs, footways, cycle tracks, &c.

1899. — 942, Mason and Mason, public urinals. 1125, McHardy and Froy, ventilating apparatus. 1161, Foster, gas burners for stoves, grates, &c. 1275, Illidge, construction of sash fasteners 1302, Grabau, cements. 1396, Williams, hinges. 1704, Stidolph, fastening of tapes for Venetian and similar lath blinds. 3659, Roger, heating and lighting apparatus. 5095, Rubens, keys and keyholes for door locks. 13,263, Roberts, fireplaces. 14,497, Schmidheiny, edge runner mills for crushing clay, &c. 15,122, Hepworth, chimney top. 19,168, Vaughan, continuous burning kilns for burning bricks and other clay goods, and also for limes and cements. 19,543, Timar, heating apparatus. 19,545, Schwinning, pavement lights and daylight reflectors for cellars, &c. 20,166, Gibbard, wood block flooring.

Keystones.

St. Mary's Church, Leicester, is to be restored.

Leeds Parish Church Organ has been renovated and rebuilt.

The Fish Market, Aberdeen, is to be extended at a cost of £4,663.

New Schools at Kemp Town, Leicester, have been built by Messrs. George Lynn and Sons.

At the Royal Military Academy, Woolwich, a new stained-glass window in the dining hall has been unveiled.

A new Fire Station at Islington, N., is being built in Upper Street at a cost (including the site) of between £20,000 and £21,000.

Charing Cross Hospital is to have a new wing, which is estimated to cost £75,000; but £50,000 is still needed before this addition can be made.

The New Post Office at Arbroath is rapidly approaching completion. It is intended to have the sorting office ready by December 18th.

A Laundry at Romford Workhouse is being built for the Board of Guardians from designs by Mr. R. L. Curtis, of 119 and 120, London Wall, E.C.

The Foundation Stone of Galway Rectory was laid recently. The architect is Mr. William N. Binns, and the builders are Messrs. J. Emerson and Sons.

Church House, Westminster.—The builders are now engaged upon the second block of the permanent buildings of the Church House in accordance with the plans revised by the late Sir Arthur Blomfield. It is estimated that the cost will be £20,000, towards which about £11,000 has been contributed or promised.

Sir Henry Tate died on December 5th at the age of eighty-one. The first design for the National Gallery of British Art, and that of the building as completed (full-page illustrations of each of which were given on one of our inset sheets last week) are, therefore, of special interest at this time. He was buried on Saturday in the family mausoleum at West Norwood.

A Handsome Drinking Fountain.—As a memorial to their late mother, Mr. Thomas Smith and Mr. Walter Smith, of Christmas cracker fame, have presented to Finsbury one of the handsomest drinking fountains in the metropolis. It is of François Premier style, and stands in the south-west corner of Finsbury Square, and has been designed and carried out by Messrs. J. Whitehead. Carrara marble, granite and stone have been employed, and no less than 200 pieces of such materials have been required.

A Crematorium at Leicester is proposed to be built. At the recent Local Government Board inquiry Mr. H. L. Goddard, the architect, submitted the plans of the building which, he explained, would adjoin the chapels already sanctioned. As regards cost, the extra amount to be added to the sum already sanctioned, if the crematorium were attached to the chapels, would be £3,000, as against £7,250 if the crematorium were erected separately with its own chapels, as in the original schemes.—There was no opposition.

Art Results in Hull and Manchester.—Some interesting figures comparing the art results at the Hull School of Art and that at Manchester have been published. In decorative painting and design, at the Manchester school 16 were marked first class, 33 gained second class, 43 failed; whilst in Hull 20 were marked first class, 7 gained second class, 3 failed. In historic ornament, architecture, and geometry, Manchester shows 114 marked first class, 54 gained second class, and 114 failed. Hull's figures are 25 marked first class, 6 marked second class, and no failures. The figures are very gratifying to the supporters of the Hull school, and afford cogent reasons for building a proper art school for the city.

The Manchester City Art Gallery is proposed to be extended.

A new organ at Norwich Cathedral has been provided. It has an oak case and gilt pipes.

New Congregational Chapel and Schools at Crookes, Sheffield, are being built at an estimated cost of £3,250.

A New Infirmary at Leyton is being erected from designs by Mr. Francis J. Sturdy, of 44, Finsbury Pavement, E.C.

At the Northampton Institute, Clerkenwell, E.C., last Friday, Sir Henry Roscoe distributed the prizes and certificates.

A Proposed new Wesleyan Chapel, in Leeds, at Beeston Hill, is estimated to cost about £2,000, and a fund is now being raised.

Mr. Charles Perrin, M.I.C.E., has been appointed water examiner for the purposes of Section 36 of the Metropolis Water Act, 1871.

A huge Timber Fire occurred on Saturday at Messrs. Haggis and Sons' sawing and planing mills at King's Cross, W.C. Messrs. John Mowlem and Co.'s premises were also involved.

The Estate of the Late Sir Arthur W. Blomfield, A.R.A., has been valued at £28,006 12s. 2d. He bequeathed his architectural books and instruments and works on art to his sons, Charles James and Arthur Conran.

A new Steam Laundry at Tee-side, Middlesbrough, has been built from designs by Councillor W. G. Roberts, of 61, Albert Road, Middlesbrough, and will give employment to about 200 hands. Mr. J. H. Smiles was the contractor.

Proposed new Town Hall for Norwich.—The Norwich City Council, at a special meeting on Friday, rescinded a resolution passed on September 29th, directing a committee to prepare a scheme for the erection of new municipal buildings. The cost of the scheme was set down at £100,000.

The Late Mr. Septimus Potts' practice and all his papers have been transferred to Mr. J. C. Parkinson, solicitor, of Imperial Chambers, 62, Dale Street, Liverpool, who is also authorised to receive all accounts due to the estate of the deceased. The deceased was a solicitor, of No. 5, Cook Street, and formerly also of York Buildings, Dale Street, Liverpool.

Bursting of a Wheel.—On Thursday last at a brick works at Kettering a large driving wheel burst. Heavy masses of steel crashed through a floor and broke down the adjoining walls. One man was struck on the head by a piece of flying masonry, and two pieces of steel weighing 4cwt. dropped on either side of another man. These pieces were found embedded in the ground to a depth of 3ft.

The Court Room, Scarborough—The Justices at Scarborough passed a resolution recently that the present accommodation for the Petty Sessions was inadequate. The court room at Scarborough is at present at the Town Hall in Castle Road. Under their scheme for adapting St. Nicholas House to municipal purposes, the Corporation are providing for the removal of the council chamber from Castle Road to St. Nicholas House, but are not proposing to transfer the courts to the new premises.

Royal Academy Prizes.—On Saturday Sir Edward Poynter presented the prizes to the Royal Academy art students. The chief prize, the gold medal and travelling studentship (£200), was awarded to Mr. Frank Moss Bennett. The Turner gold medal and scholarship for landscape went to Mr. F. Appleyard, who also took four other prizes. The gold medal and travelling studentship for sculpture fell to Mr. Gilbert W. Bayes (Æneas leaving Troy), and the similar distinction for design in architecture to Mr. Horace C. Hide (design for public school). The design for the decoration of a portion of a public building (Spring driving out Winter), which secured a prize of £40, was by Mr. Appleyard. Miss Florence E. Chaplin and Miss H. E. Thomas received the silver medals for the draped figure, and Misses Gertrude Lindsay, Winifred Hunt, and Mary C. Buzzard were awarded medals in other compositions.

A collection of Pictures by Mr. J. L. Thaddeus have been secured for exhibition at the Crystal Palace. The proceeds go to the War Fund.

A new font and cover has been placed in the church at East Allington, Devon. It is designed in the thirteenth century style and is of marble and alabaster, with a carved oak spiral cover. The work has been executed by Messrs. Harry Hems and Sons, of Exeter.

Foulden Parish Church, Berwick, after being renovated, has been re-opened for public worship. It is well known on the Borderland as the place where the Commissioners of Queen Elizabeth met the Commissioners of James VI., King of Scotland, to give explanations regarding the execution of Queen Mary.

For Preserving—not Restoring—Aston Hall, Birmingham, £705 14s. 8d. has been subscribed and handed to the Lord Mayor, who proposed a vote of thanks to the donors at the last meeting of the Birmingham City Council. In connection with the proposed extensions of the fire stations, it was stated that, since 1892, 20,841 buildings had been erected in the city.

"Ellipse by Compasses."—We regret that in this article, published on page 270 of last week's issue, there are some typographical errors. The letter "*z*" was substituted for "*g*," and in several instances the distinguishing mark (′) was omitted, "*g*" being substituted for "*g′*," and so on. We have no doubt, however, that our readers have been able to follow the description, despite these inaccuracies.

"Old Colonial Houses of the Cape of Good Hope" is the title of a book (royal quarto) issued this week by Mr. Batsford, in which many of the quaint and picturesque buildings erected by the early Dutch settlers are illustrated from sketches in pen and ink or crayons by Mrs. Alys Fane Trotter, and by half-toned reproductions from photographs. Mrs. Trotter's notes upon the subjects are accompanied by a short account of the "Origin of Old Cape Architecture," by Mr. Herbert Baker, A.R.I.B.A., with sketches by its author. Many good and typical examples of these old houses yet remain within a few miles of Cape Town.

Concrete on Fire.—A startling discovery was made last week that the concrete foundation, 8ft. thick, underneath two of the five boilers in the Chester Corporation Electric Light Works was a red-hot, burning mass. The fire did not spread to the concrete under the other boilers, and no sudden cessation of the supply of electric light was caused. The Corporation Lighting Committee have had several special meetings on the subject but are still investigating. It is stated that, in the case of the three boilers originally constructed, a layer of bricks separated the fire from the concrete below, and that in the case of the two boilers more recently added there was no such layer of bricks. However this may be, no effort will be spared to get at the bottom of the extraordinary affair, or to repair the mischief already done.

Rights of Light Again.—A man named Morton was sued for £1 11s. at the Mansfield County Court on December 5th by the Sutton-in-Ashfield Urban District Council for erecting property, in Short Street, Sutton, with windows overlooking land belonging to the plaintiffs. He was asked to pay an acknowledgement of 1s. per year to the Council, but this he refused to do, and the plaintiffs therefore blocked his light with a hoarding. The case turned on the point of whether a small strip or gusset of land existed between the defendant's wall and the public footpath. Morton said it did not exist, and as the hoarding trespassed on to his property by touching his building, he had it taken down. It was for this removal that the Council brought the case into court. In the end, his honour gave judgment for the plaintiffs for the amount claimed, but refused to grant an injunction against the defendant removing a hoarding, because he held that the one removed had infringed on the defendant's wall.

COMING EVENTS.

Wednesday, December 13.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. F. W Deas, M.A., on "Notes on Eleventh Century Buildings in South-Eastern Italy." 8 p.m.

SANITARY INSTITUTE.—Council Meeting at 5 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. Frank Baker, F.G.S., on "Canterbury and Winchester Cathedrals" 7.30 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Half-yearly general meeting for the election of officers for 1900, &c., at 4.30 p.m. Annual dinner at 7 p.m.

BIRMINGHAM AND DISTRICT CLERK OF WORKS AND BUILDERS' FOREMAN'S ASSOCIATION.—Mr. W. H. Bidlake, M.A., R.I.B.A., on "Building Construction of the Ancient Romans." 8 p.m.

SOCIETY OF ENGINEERS.—Annual dinner at 7.30 p.m.

Thursday, December 14.

SOCIETY OF ARTS.—Meeting of Indian Section.

SOCIETY OF ARCHITECTS.—Mr. Ellis Marsland on "The Statutory Registration of Architects." 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Meeting at 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: The Upper Limb."

Friday, December 15.

ARCHITECTURAL ASSOCIATION.—Mr. Andrew Oliver, A.R.I.B.A., on "Old London

Saturday, December 16.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE AND ART.—Visit to Caird Hospital and Royal Bank Buildings at 2 p.m.

Monday, December 18.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. Thomas Blashill, F.R.I.B.A., on "The Architect in Relation to Fire Prevention." 8 p.m.

Tuesday, December 19.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. Richard Wood on "Modern Building Construction in Chicago." 6.30 p.m.

SOCIETY OF DESIGNERS.—Members evening. 7 p.m.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. R. Caulfield Orpen on "Modern Domestic Interiors." 8 p.m.

GLASGOW ARCHITECTURAL ASSOCIATION.—Mr. D. Bennett Dobson on "Simple Calculations for Strains in Structures."

Wednesday, December 20.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.—Ordinary Meeting of members at 8 p.m.

SOCIETY OF ARTS.—Mr. H. Bloomfield Bare, F.R.I.B.A., on "Bi-manual Training by Blackboard Drawing." 8 p.m.

CURRENT PRICES.

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ...	per cwt.	1 3	1 6 10
Colza Oil, English ...	per cwt.	1 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 10 0	—
Linseed Oil	per cwt.	1 1 6	—
Petroleum, American ...	per gal.	0 0 7⅜	0 0 7½
Do., Russian ...	per gal.	0 0 6⅜	0 0 6½
Pitch	per barrel	0 8 6	—
Tallow, Town	per cwt.	1 5 3	1 7 6
Tar, Stockholm	per barrel	1 5 0	1 5 6
Turpentine	per cwt.	1 16 6	1 16 7½
Lead, white, ground, carbonate	per cwt.	1 3 0	1 4 0
Do. red	per cwt.	1 0 4½	—
Soda crystals	per ton	3 0 0	—
Shellac, orange	per cwt.	3 3 0	3 4 0

FLOORING BLOCKS.

Per 100 Blocks out of sizes.	YELLOW.		PITCH PINE
	At Wharf.	ex Ship within one month.	At Wha
17¼ × 3 × 3	12 7	11 4	20
17¼ × 3 × 2	8 10	8 1	14
17¼ × 3 × 1⅛	6 9	6 2	10

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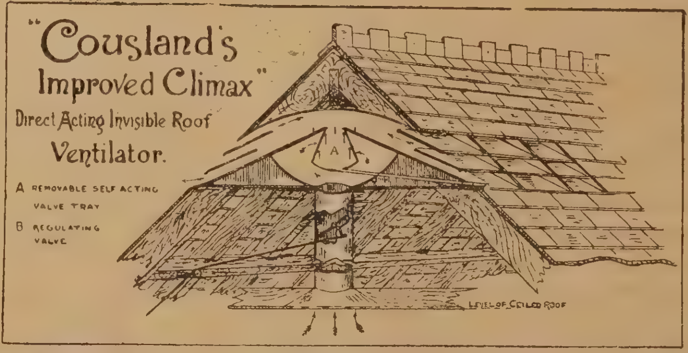

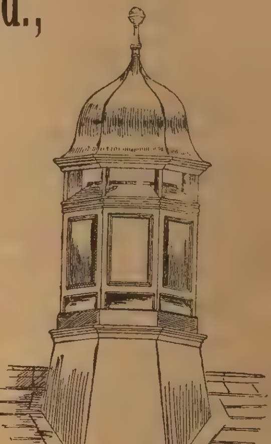

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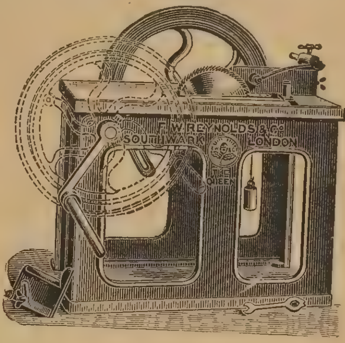

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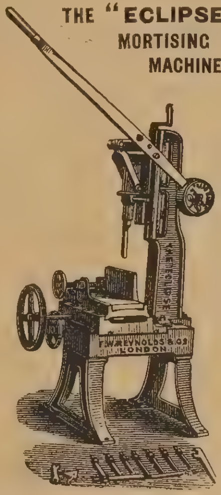

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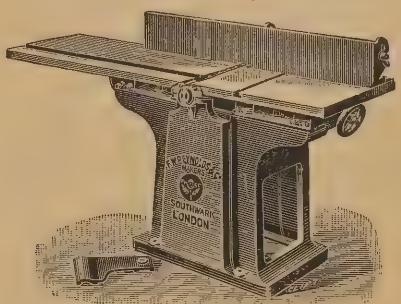

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Do. English ingots ...	do.	124 0 0	125 0 0
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Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
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Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	18 0 0	—
Do. do. 2nd „	do.	10 10 0	12 0 0
Do. do. Unsorted „	do.	10 15 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	12 5 0	16 15 0
Do. White Sea	do.	10 10 0	17 15 0
Do. Quebec Pine, 1st...	do.	19 5 0	24 10 0
Do. do. 2nd	do.	16 10 0	—
Do. do. 3rd &c.	do	9 5 0	9 15 0
Do. Canadian Spruce, 1st	per P. Std.	11 15 0	—
Do. do. 3rd & 2nd	do.	8 5 0	9 5 0
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TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

CHELSFIELD (Kent).—For additions, alterations, and new sanitary arrangements at the Board Schools, Chelsfield, Kent. Mr. St. Pierre Harris, architect. Quantities by Messrs. Stanger and Son :—

Stebbings and Pannett	£2,042	W. Owen	£1,794
T. Knight	2,010	Somerford and Son ...	1,759
T. D. Graty	1,990	J. Smith, Chelsfield* ..	1,751
R. A. Lowe	1,949		

* Provisionally accepted.

FARNBOROUGH (Hants).—For the erection of a residence, Alexandra-road, for Miss Pincknay. Mr. W. E. Trevena, architect, Farnborough. Quantities supplied :—

Bottrill and Son	£2,362	McCarthy E. Fitt ...	£2,159
Martin, Wells, and Co.	2,300	Hawkin	2,005
Hooker	2,300	Hughes, Wokingham*	1,960
Kemp...	2,200		

* Accepted.

HAYDOCK (St. Helens).—For the erection of a factory for the Schwartzkopff Coal-Dust Firing Syndicate. Messrs. Charles H. Beloe and Frank E. Priest, engineers :—

Morrison and Sons	£6,000 0 0	Henshaw and Sons	£4,960 0 0
Roberts and Robinson ...	5,600 0 0	Neil and Sons ...	4,730 0 0
Thornton and Sons	5,195 0 0	C. Burt*	4,575 0 0
Holme and King	5,137 11 10	Holme and Green‡	4,450 0 0
J. Taylor‡	4,975 0 0	Jones and Sons‡	4,350 0 0

* Accepted. ‡ Withdrawn.

HENDON.—For the construction of 1,010 yards of 15in. pipe-sewer and 940 yards of 12in. ditto, together with manholes and flushing chamber, for the Urban District Council of Hendon. Mr. S. Slater Grimley, engineer :—

T. Adams	£5,499 6 6	James Dickson...	£3,770 16 4
E. H. Jackson ...	4,740 14 9	M. S. Ketteringham, Waltham Cross*	3,650 3 0
Killingback and Co.	4,577 17 5	J. and F. Binns (too late)	3,597 4 2
Ballard, Ltd. ...	4,456 9 1		
Pedrette and Co.	4,321 0 0		
Clift Ford	4,118 0 0		

*Provisionally accepted.

LONDON.—For road-making, tar-paving, &c., at the Western Hospital, for the Metropolitan Asylums Board :—

Wimpey and Co.	£3,300	Parry and Co.	£2,614
Thos. Adams.	3,287	Ballard, Ltd., Child's Hill*	2,452
C. Ford	3,065	Wainwright & Co.	Informal.
Bentham and Co. ...	2,749		
Grounds and Newton	2,680		

* Accepted.

[Surveyor's estimate, £3,185.]

LONDON, E.C.—For alterations at No. 3, St. Bride's-street, E.C., for Messrs. Thos. Cook and Son. Mr. Frank E. Smee, architect, 12, West Smithfield, E.C. :—

W. H. Lascelles and Co.	£2,393 0	James Smith & Sons	£2,234 0
Chas. Spreckley and Co.	2,352 0	J. Nixon	1,995 0
		H. and A. Lea* ...	1,992 10

* Accepted.

LONDON, E.C.—Accepted for alteration to shop, No. 3, St. Bride's-street, E.C., for Messrs. Iliffe, Sons, and Sturmey. Mr. Frank E. Smee, architect, 12, West Smithfield, E.C. :—

H. and E. Lea £227 10

PURTON (Wilts). — For the construction of covered service reservoir, Pavenhill, and other water supply works, for the Cricklade and Wootton Bassett Rural District Council. Mr. F. Redman, engineer, Newport-street, Swindon :—

J. & T. Binns ...	£2,396 0 0	Fleweeling and Huckson	£1,669 0 0
J. James	1,861 10 0	Smith and Son...	1,515 12 0
Bentham & Co.	1,845 16 0	A. J. Colborne ...	1,486 18 9
Smith and Watkins	1,712 12 6	Winchcombe, Wroughton, Wilts*	1,542 5 0
W. L. Meredith	1,691 19 6		

* Accepted.

WALMER (Kent).—For the erection of a residence on the Leith Estate, for Mr. W. H. F. Sanders. Mr. Edward W. Fry, architect, Cannon-street, Dover. Quantities by architect :—

	House.	Boundary Fences.
Hayward and Paramor	£2,139	£176 0
J. E. Turner...	1,996	160 0
Denne and Son	1,866	163 0
W. Bromley	1,858	170 0
J. J. Wise	1,848	157 0
T. T. Denne...	1,840	156 0
J. E. Trevers	1,825	162 0
Hayward and Son...	1,785	173 10
G. B. and A. J. Cottew, Deal*...	1,766	180 10

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THE VENTILATION OF SEWERS.*

By D. S. DAVIES, M.D., M.O.H., Bristol.

IT is very necessary, in considering the question of sewer ventilation, to dissociate this entirely from the question of house-drain ventilation. I may state at once that in my opinion every house drain should be cut off from the street sewer by an intercepting trap, and the soil pipe properly ventilated in full diameter above the roof, and all other conditions observed to render the admission of drain air to the house impossible. It is unnecessary to take up your time by insisting upon the danger of drain or sewer air admitted into enclosed places, or upon the undoubted possibility of resulting septicæmia, erysipelas, or enteric fever; nor need we discuss the method by which the causal organisms, with difficulty separable from moist surfaces, get carried, under conditions of intermittent use and partial drying of drain contents or otherwise, by air currents into dwellings. Beyond this, is it necessary to ventilate the public sewer, that is to provide designed inlets and outlets so as to encourage air currents continuously and regularly throughout the sewer?

It is generally assumed that sewers must be ventilated, apparently with no greater reason than is to be found by following the analogy of house drains. A properly-constructed sewer does not admit of much deposit, so that little chance of decomposition occurs; but all sewers get fouled and the sides slimy, and are thus capable of smelling offensively under certain conditions of flow and temperature. Considerable smell from an open sewer need not indicate the evolution of volumes of gas, or a great increase of pressure.

As Dr. Francis Clark, of Lowestoft, has put it, "It is better to bottle a smell than to dilute and so 'purify' it by spoiling a large bulk of pure air, and there are better ways of dealing with sewage emanations than that of forcing them down the throat of the 'man in the street' by mixing them with the atmosphere we breathe."

I fully agree, too, with Dr. Clark's suggestions that the foul odours which emanate from open street grids must be confined to their proper place, the sewer. I agree with him also that in any form of sewer, provided the houses are properly disconnected, little or no ventilation is required, and fresh air inlets are a serious mistake; for the more fresh air you suck or pump into your sewers, the more fouled air will there be emanating at other points, and contaminating the atmosphere, without in any way benefitting the sewer or its tributaries.

If any shafts at all are required, an occasional upcast here and there would suffice to equalise pressure caused by unequal flow, admission of storm water, &c.; but even these appear to be superfluous, for should the sewer air pressure increase so as to pass the water seal of the intercepting trap, it finds immediate vent up the open soil pipe ventilator, and cannot enter the house. And where the street gullies admit storm water to the sewers, as in Bristol, a further safety valve through the water seal of these gullies is afforded, with this advantage, that the escaping air is washed as it bubbles through, and causes no offence on its escape into the open streets.

The only time, indeed, when in Bristol we get smells or complaints from the sewers is after prolonged drought, when the gullies dry, and our system approximates to that of a ventilated town; this is easily set right by sending a watercart round to fill up the gullies.

Secondly,—Is there medical evidence of the need for ventilation? In Bristol the sewers are totally unventilated; and as they have been so since they were constructed, it is a point of great importance to ascertain the ill effect, if any, upon the public health. For this purpose I prepared for the use of the Bristol Council the following analysis of the Registrar-General's ten years' returns (1887-96) relating to Bristol and certain other towns noted as generally healthy:

	All Causes per 1,000 persons living.	Infant Mortality per 1,000 births.	Per 100,000 living.		
			Fever.	Diphtheria.	Diarrhœa.
Thirty-three Great Towns	20·6	167	20	29	84
London	19·9	155	15	45	67
Bristol (including Clifton)	18·9	146	11	13	49
Brighton	17·7	149	11	18	66
Croydon	14·5	126	11	32	46
Clifton (from local returns)	13·8	115	8	6	21

Here are the death rates from all causes, the infant mortality (per 1,000 births), and the death rates from fever, diphtheria and diarrhœa, which may reasonably be looked to as indicative of good or bad sanitary condition. Ten years is a reasonably long period, enough to equalise results and prevent accidental error. Croydon is chosen for comparison because it has the lowest general death rate of the thirty-three great towns, is with good reason proud of its healthiness, and is a "ventilated" town; so is London, and so are most, if not all, of the thirty-three towns. Brighton is included for similar reasons.

As to general death rate, that for Bristol, while below the rate for London and the thirty-three towns, is higher than that for Croydon and for Brighton; but the Clifton rate is below that for Croydon, and considerably below that for Brighton.

As to Fever.—The rate for Bristol (unventilated) is exactly equal to the rate for Croydon (ventilated), and is also exactly equal to that for Brighton (ventilated). So far as the important question of fever mortality is concerned, then, towns using exactly opposite systems as to sewer ventilation are upon an equality. The rate for Clifton (unventilated) is considerably below the rate for Croydon, and equally below the rate for Brighton. The fever rate for Bristol and Clifton are both markedly below the rate for London, and for the thirty-three towns. As Bristol is an old, densely populated, and closely built city, the fever rate might be supposed to be in excess in comparison with Croydon, especially if unventilated sewers had any ill effect, but it is equal to it, and that for Clifton is much lower.

As to Diphtheria.—The rate for Croydon (ventilated) is more than double the rate for Bristol (unventilated); and more than five times the rate for Clifton (unventilated). The rate for the thirty-three great towns is more than double the rate for Bristol, and the London rate is more than three times as large as that for Bristol. The rate for Clifton is less than half the Bristol rate, less than a quarter the rate of the thirty-three towns, and is less than one-seventh of the London rate. Brighton shows a diphtheria rate higher than that for Bristol, and three times as high as the rate for Clifton. (Clifton forms part of Bristol.) Some increase in diphtheria mortality has of late years been observed in Bristol, as in other large towns, but in far less degree. It is obvious that, if the increase of diphtheria in Bristol is to be attributed to the unventilated condition of the sewers, the far greater increase in other towns may with equal reason be ascribed to the ventilated condition of their sewers; the healthiest of these towns show diphtheria mortality rates which are from three to five times as high as that for Clifton.

As to Fatal Diarrhœa.—The rate in Bristol is 49 (per 100,000), as compared with Croydon's 46, with Brighton's 66, with London's 67, and with the thirty-three towns' 84. The Croydon rate, 46, is more than double that for Clifton, which is only 21.

Infant Mortality.—That for Croydon, 126, is very favourable; but Clifton is considerably lower, 115. The Bristol rate, 146, is the next lowest of the thirty-three great towns, which collectively show a rate of 167, and is below Brighton, which is 149, and London, which is 155.

These figures for ten years show that old Bristol need not fear comparison with a new town (Croydon), somewhat remarkable for healthiness; or with other great towns generally, or with London. Clifton (including a populous working-class district in the Hotwells) stands far above these towns for general health, and especially for its freedom from fever, diphtheria and diarrhœa.

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[*] A paper read before the Annual Congress of the Sanitary Institute, held at Southampton on August 29th, 30th, and 31st.

LLANDUDNO MUNICIPAL BUILDINGS.

AN IMPORTANT CASE.

IN the Chancery Division of the High Court of Justice on December 5th, 6th, and 7th, Mr. Justice Cozens-Hardy heard the action brought against the Llandudno District Council by Mr. Samuel Warburton, builder, Miles Platting, for 15 per cent. profit on a contract entered into by him to erect the new municipal buildings at Llandudno for £13,800, and for £500 damages from the defendants for turning him out of the site. The defendants contend that the plaintiff revoked the contract by refusing to furnish the architect with a sealed copy of the original estimate duly verified. Mr. Astbury, Q.C., and Mr. Taylor appeared for the plaintiff, and Mr. Eve, Q.C., and Mr. Hewitt represented the Llandudno Council.—The plaintiff stated that he had been a master builder for nearly forty years, and had constructed works for the War Office, the Post Office, and various railways and corporations in the North of England. He tendered for this work in October 1898, and he obtained a bill of quantities from the defendants' surveyors. He received in due time a notice that his tender had been accepted, and at the end of November he received from the town clerk a copy of the contract. He insisted on the word "sealed" being inserted in the paragraph relating to the furnishing of a copy of the original estimate to the architects. The original estimate was not required by the person employing a builder until the squaring-up for alterations and additions, and there was no object for which the architect or surveyor could desire to see the estimate until the contract was completed. It was unfair that the architect or surveyor should see the original estimate before deciding on what additions there should be. The copy which was furnished the defendants was verified by Messrs. Lees, chartered accountants, and he was of opinion that that was a sufficient verification under the terms of the contract. The architects did not tell him that he was not to commence the work until the copy was furnished to them, but they pressed him to get on with the building. He put upon the site materials which cost him £78. He offered to allow Mr. Connolly, the town clerk, or Mr. Lockwood, of Chester, to verify the copy. In other contracts he had entered into he had never been asked to verify the copy. While he was on the property he was ready and willing to go on with the contract properly and reasonably, and he had never refused to carry out any term he was bound to carry out. He claimed £500 damages because persons might see that his tender was accepted, and then another builder would have his tender accepted, and it might be thought that it was through negligence or defect on his part that he had not been allowed to go on with the work. He certainly thought he had been injured by the defendants' proceedings.—In cross-examination, the witness said it was an uncommon thing to require the sealed copies to be sent in with the tenders, but it was sometimes done. He objected to any quantity surveyor who had an interest in the building, or power of making alterations, seeing his prices and so being enabled to pick out the plums and leave the stones.—Mr. John Holden, architect and surveyor, said that in his experience there was nothing that the copy of the estimates could be required for except the purpose of adding up the extras at the end of the contract. He thought £500 was a small amount to put down as damages, and though 15 per cent. of profit might be a reasonable sum he could not say whether the plaintiff would have made so much.—For the defence Mr. Eve submitted that by the contract there was to be a verified copy of the original estimate for the sole use of the architect and surveyor appointed. The object of that was that it should be deposited in such a manner that it should not be available for anyone but the architect and surveyor.—Mr. Justice Cozens-Hardy asked what ground the defendants had for importing into the contract that the copy was to be verified by the architect or quantity surveyor.—Mr. Eve said that that would be done for the protection of the employer, whose architect was entitled to look at the estimate, and if the plaintiff came to the court for damages and said he handed the copy to the defendants on the promise that it should not be looked at, that disentitled him to damages. Further, he submitted there never was any verification within the meaning of the clause in the contract, and that verification should be done not by an accountant, but by the contracting parties.—Mr. Alfred Connolly, town clerk of Llandudno, and Mr. Thomas Silcock, the architect of the building, were called for the defendants, the latter stating that owing to the great rise in building materials it was very doubtful whether the plaintiff would have made a profit if he had completed the building.

In giving judgment Mr. Justice Cozens-Hardy said that by the third of the general conditions it was provided that the contractor should, on the signing of the contract, furnish the architect with a verified sealed copy of the original estimate for his own sole use, and that of the surveyor appointed for the purpose of the agreement. There was a provision in the contract that extras ordered by the architect were to be paid for according to the prices set out in the original estimate. Plaintiff agreed if his tender was accepted to deliver to the architect, under seal, a fully priced copy of his bill of quantities in order that the value of any additional or extra work might be ascertained. The contractor prepared his estimate and priced it up, and he got an accountant, whose competence was not questioned, to examine a copy with the original, and he certified it as correct. The copy was then sealed and sent to the architect. The Llandudno Council took up a position which he was entirely unable to appreciate. They said the third clause meant that the contractor must not only furnish a verified or certified copy of his original estimate, but that he must furnish a copy which was verified by the quantity surveyor who had prepared the bill of quantities. What ground in reason or probability was there for inserting such a term as that? He entirely failed to see any justification for such an intention. Were the Llandudno Council right in refusing to allow the plaintiff to go on with the work and making a fresh contract on the ground that he had failed to furnish the architect with a verified sealed copy of the original estimate as provided by the contract? He thought the Council were wrong, and that Mr. Warburton absolutely and entirely complied with every obligation under clause 3 when he sent to them a sealed copy of the original estimate verified and certified. He, therefore, must make the declaration which the plaintiff asked for, that upon the true construction of the agreement the defendants were not entitled to require that a verified sealed copy of the original estimate should be further verified by the architect, and that being so, it followed that the defendants had been guilty of a breach of their contract with the plaintiff. The plaintiff claimed damages on the footing that he would have made a 15 per cent. profit on the contract, but that was too high a percentage, and having regard to the rise in the price of building materials since the contract was entered into, he would give judgment for the plaintiff for £1,000 damages for breach of contract. The plaintiff further claimed £500 compensation for damage to his reputation in consequence of the publication in trade and other journals that his contract had been cancelled. There was no allegation of misconduct on plaintiff's part, and he could see no justification for that claim. It would be wrong to mulct the defendants in special damages on the footing that plaintiff's reputation had been damaged by the publication of statements, not that Warburton was a bad builder, but that he was not as good a lawyer as the Urban District Council of Llandudno thought themselves to be. There would be judgment for the plaintiff, the defendants must pay the costs of the action, and the counter-claim would be dismissed with costs.

SUPPLYING COUNTRY MANSIONS WITH WATER.

At a recent meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, Mr. John C. Fell, president, in the chair, a paper was read on "Water Supply to Country Mansions and Estates" by Mr. Gordon Harris, A.M.I.C.E. He observed that the cost of supplying an estate with water by the antiquated methods of either manual labour or uneconomical steam engines was very high. A gravitation scheme was far preferable, provided the source of supply was not too far distant. The objections to manual labour were pointed out, and pumping by animal power was considered more economical than by hand power. A small steam engine was not desirable on account of the heavy fuel bill and cost of attendance it involved. A gas engine could rarely be used in country mansions owing to the absence of a gas supply, but where gas was available a gas engine was very advantageous. The oil engine was strongly recommended as possessing every advantage as regards its fuel supply, its simplicity, and its economy in working. The author then gave the following comparison of the cost of pumping 1,000 gallons of water to a height of 100ft. by various powers: (1) Hand labour at 18s. per week, 26·5 pence; (2) horse power, man at 18s. per week, 4·20 pence; (3) gas engine and pump, with gas at 4s. per 1,000 c.f., 1·44 pence; (4) small steam pump and boiler, with coal at £1 per ton, 0·75 pence; (5) oil engine and pump, with oil at 7d. per gallon, 0·70 pence; (6) electrically driven pump, worked from a lighting dynamo, 0·45 pence.

The cost of attendance is excluded in Nos. 3, 4, 5 and 6; in No. 4 an allowance should be made varying in amount with the total daily supply and other conditions, and an addition must be made for coal used in getting up steam. As the cheapest and most lasting water raiser, the author stated that the hydraulic ram still retained its popularity. Water wheels, hydraulic pumps and windmills were also discussed, and their respective advantages and disadvantages pointed out.

Examples were then given of the practical application of the mechanical agents referred to, and installations of various kinds on several estates and in large establishments were described and illustrated. Amongst other useful pumping appliances employed, the "Hatfield" treble barrel pump, manufactured by Messrs. Merryweather and Sons, was referred to. This pump could be driven at 700 revolutions or more per minute, and might therefore be coupled direct with an electric motor. It was stated that a number of these pumps were running in connection with water services, being driven by small high-speed oil engines as well as by electric motors. Another engine, known as "Squire's," had also been designed for special use on estates, and was applicable to general purposes as well as for water supply.

After referring to the question of well-boring, the author touched on the subject of locating water by divining, observing that some very curious successes had been achieved by that means, but at the same time he instanced a case in which he was consulted where the diviner's prediction had proved utterly valueless.

With regard to the important question of the utilisation of a portion of a water supply for fire extinguishing purposes, it was remarked that a large reserve must be secured for this purpose, and the author described various arrangements of fire-service that he had carried out in practice. These arrangements included gravitation and power systems. For meeting cases in which there was a deficiency of pressure the author had devised a very efficient automatic pressure augmentor, which he explained. In conclusion, the author observed that, failing the existence of the conditions necessary for a gravitation supply, or if the adoption of powerful machines was inadmissible for fire extinction, recourse must be had to the portable steam engine or to the less efficient manual engine, provided the source of supply was situate within a reasonable distance.

Masters and Men.

Aberdeen Joiners' Wages.—Official information was sent last week to the Aberdeen Operative Joiners by Mr. H. Peterkin, solicitor, secretary of the Master Joiners' Association, intimating that in consequence of the present state of trade the wages of the workmen would be reduced ½d. per hour, to take effect from April 1st. next. The present rate of wages is 8½d. per hour.

The Threatened Building Dispute at Bradford between the Master Plasterers' Association of Bradford and the Operatives' Society is now likely to be settled in an amicable manner. It will be remembered that the men demanded an advance from 8½d. per hour to 10½d. per hour, commencing from January 1st next, but as a result of negotiations an offer of 9½d. per hour, commencing on February 1st. has been accepted.

The Fair Contracts Question at Colne.—At the monthly meeting of the Colne Town Council it was decided that the following clause should be included in advertisements for tenders for work, and also in the conditions of future contracts :—"The contractor shall pay his workmen employed not less than the standard rate of wages in each branch of trade at the date of the contract, and in subletting any portion of his contract must see that the subcontractor adheres to this as far as possible."

Workmen's Compensation at Lanark.—Sheriff Fyfe gave judgment last week in a case under the Workmen's Compensation Act, in which Mrs. Catherine Walker or Macintosh, widow, Clyde Place, Motherwell, sued George Pirie, contractor, Nethanview, Lesmahagow, for £185 5s. as compensation for the loss of her son, who was killed while in defender's employment. The deceased while in the course of his employment at a railway viaduct at Lesmahagow met with an accident by which he was killed, and his lordship found that pursuer was partially dependent upon the earnings of deceased, and awarded £50 as compensation, with £5 modified costs.

The Blindness of Trade Unions.—Sir B. C. Browne says, in the "Engineering Magazine," that disputes as to wages between employers and workmen are of very much less importance than questions as to restrictions of trade and management of works. The settlement of questions as to the difference between piece and time work, of the questions of a greater number of machines being worked by one man, and, still more important, of the question of substituting machine for hand labour—these, and numberless other matters that are often in dispute in English workshops, are, therefore, far more vital than mere rates of wages. It is probably the case that, if the workmen could see their way to throw themselves heart and soul into the views of the employers in trying to economise the cost of work, they could get, with little or no trouble, a very large increase in their wages, make very much larger incomes, and having much more permanent work, with employment for a much greater number.

Sliding Scales for Wages.—Although trade union leaders have little liking for the automatic re-adjustment of wages from time to time in proportion to profits, it would be an immense gain to the kingdom if that method were adopted in all productive industries. In the extensive iron and steel producing area over which the Northern Conciliation Board exercises authority, the present year has borne fresh witness to the unmixed good resulting to employers and employees alike, from placing it beyond the power of both to employ coercion for either the raising or lowering of the wage-rate. Not a single strike or lockout, nor even any threat has occurred, although prices have been rising almost continuously throughout the whole period. As market rates increased, the wage rates correspondingly advanced, capital and labour thus sharing, on equitable terms, the enhanced prosperity of their joint labours. While, on the one hand, the market value of manufactured iron has now reached a higher level than during the last ten years, the operation of the sliding scale has given the workers a total advance of 12½ per cent. since the beginning of the present year, and they are said to be entirely satisfied with this handsome share of the augmented profits. Whether they would be equally content with the arrangement should prices fall, consequent on over-production, is a different question. The South Wales pitmen, it will be remembered, threw over the sliding scale because, in their opinion, it was more advantageous to employers than to employed.

Builders' Notes.

Belgian Contracts for British Work.—Extensive contracts for the supply of iron girders, &c., in connection with the construction of the National Harbour at Dover, have been secured by Belgian firms.

Smoke Abatement in Sheffield—At the Sheffield city Police Court on December 6th the Victoria Steam Laundry Company, Howard Street, were fined 30s. and costs for disobeying an order made upon them to abate a nuisance caused by their chimney.

The heating of the wards of the new "Alexandria" Hospital in Queen Square, Bloomsbury, W.C., which was recently opened by H.R.H. the Princess of Wales, was carried out by Messrs. Hendry and Pattisson, Ltd., of London, the system used being D. O. Boyd's improved warm-air Ward stoves and grates. The same firm have also recently completed the heating and ventilating, on D. O. Boyd's system, for the new isolation hospital, erected by the Enfield Urban District Council at Winchmore Hill. The East London Hospital, the North-Eastern Hospital, the Croydon General Hospital, and the Chesham Cottage Hospital have also been supplied with the warm air grates and ventilators, of which this firm make a speciality.

London County Council.—At the meeting of the Council held on December 5th, the report of the Main Drainage Committee, recommending an expenditure of £1,250,000, was adopted. This is part of the great main drainage scheme, which is estimated to cost nearly three millions of money and full particulars of which will be found on page cxvii. of the supplement to No. CCXLIX. of the BUILDERS' JOURNAL. The work will take twelve years to complete. Mr. Henry Ward, the chairman of the committee, said that the proposal to construct a separate set of sewers for surface water was now impossible, for it would involve an expenditure of £20,000,000, and a similar sum would be needed to put in surface-water drains to the houses. As information has often been asked about the York watergate in the Victoria Embankment Gardens, it was decided that an oak tablet should be placed near it bearing the following inscription: "This gateway, formerly the watergate or approach from the Thames to York House, Charing Cross, originally the London lodging of the Archbishops of York, the birthplace of Lord Chancellor Bacon, and afterwards the residence of George Villiers, second Duke of Buckingham, was designed by Inigo Jones, architect (1572-1652), and executed between 1624-28 by Nicholas Stone, master mason (1586-1647), for the first Duke of Buckingham, and marks the river margin before the embankment was constructed. The inscription on the north frieze, 'Fidei coticula crux' (the Cross is the touchstone of faith), is the motto of the Villiers family, whose arms are on the south front. By the London Open Spaces Act, 1893, the gateway was vested in the London County Council, who repaired the structure and took measures for its preservation *in situ* as an interesting landmark of London." After some discussion it was agreed to construct a lodging house for men on the model of the Rowton Houses, the site chosen being in Mill Lane, Deptford. The Council approved the action of the Improvements Committee in at once arranging for the widening of the Strand in connection with the Holywell Street block.

Surveying and Sanitary Notes.

The late Mr. J. C. Jonas, land agent and surveyor, of Great Shelford, Cambridge, died worth £43,988, 8s. 7d.

Insanitary Houses at Gainsborough.—Last week the Gainsborough Urban District Council condemned nine houses in Sailors' Alley, a *cul-de-sac* 17ft. wide, as being unfit for human habitation.

Engineer to the Birmingham Tame and Rea Drainage Board.—Mr. John Duncan Watson, sanitary engineer for the county of Aberdeen, has been appointed engineer to this Board at a salary of £800 a year.

Street Improvements at Halifax and the construction of new roads, for which the Town Council seek sanction to borrow £58,899, formed the subject of a Local Government Board inquiry last week. There was no opposition.

Town Hall Square Scheme at St. Helens.—It has been decided by the parliamentary committee of the St. Helens Town Council to apply to the Local Government Board for their sanction to the borrowing of £8,500, the amount estimated to be the cost of carrying out the scheme for making the Town Hall Square.

Bristol Improvements.—A Local Government Board inquiry was held last week into the application of the Bristol Corporation for sanction to borrow £15,300 for land for electric lighting purposes, £13,418 for baths, £11,745 for the Cheltenham Road Library, £6,358 for a sanitary depôt, and £155 for street improvement purposes.

Wakefield City Council Fined £100.—At the Wakefield County Court on December 5th, the town clerk (Mr. Hudson) applied on behalf of the Corporation for a further extension of the time allowed them in which to complete their sewerage works. Mr. Trevor Edwards, the West Riding solicitor, opposed the application, and asked the judge to enforce an order against the Corporation for polluting the river Calder. He said the County Council had no vindictive feeling against the City Council, but there had already been extensions of time and reasonable diligence had not been exercised by the Corporation. The town clerk said that, owing to the activity in the iron trade and other unforeseen circumstances, the contractors had been delayed, and found it impossible to complete the work in the time allowed. His honour ordered the Corporation to pay £100, the penalty not to be enforced if the work was completed and the nuisance abated within three months.

Projected Improvements at Scarborough.—A special meeting of the Scarborough Town Council was held on December 6th to decide as to the expediency of promoting a Bill in Parliament to empower the Corporation to make an approach road along the old town to the Marine Drive round the foot of the Castle Hill, and to alter the line of the sea-wall of the drive; to widen and improve the Valley Bridge, which connects the central part of the town with the South Cliff; and to construct a street tramway along the Foreshore from the Spa grounds in the south to Peasholme in the North Bay. It was decided to proceed with the Bill in the next session of Parliament.

Surveyors' Institution Examinations.—The Students' Preliminary Examination will be held on the 17th and 18th of January next. It is proposed to examine candidates from the counties of Lancashire, Cheshire, Yorkshire, Durham, Cumberland, Westmoreland and Northumberland, at Manchester. Candidates from other counties in England and Wales will be examined in London, Irish candidates in Dublin, and Scottish candidates in Glasgow. The Students' Proficiency Examination will commence on the 19th of March next. Examinations qualifying for the classes of Professional Associates and Fellows will also commence on the 19th of March. English candidates for the Professional Examinations will be examined in London, Irish candidates in Dublin, and Scottish candidates in Glasgow. The next Special-Certificate Examinations in Forestry and Sanitary Science will be held on Tuesday, Wednesday and Thursday, the 12th, 13th and 14th of June next. Particulars of all the examinations can be obtained from the secretary at 12, Great George Street, Westminster, S.W.

A Case About a Stoppage in a Drain.—Mr. John Greenfield, a solicitor, appeared at the North London Police Court on December 5th on a charge of having disobeyed an order of the Court to abate a nuisance on his premises at 9, Quadrant Road. The Islington Vestry were the prosecutors. The case was that Mr. Greenfield's house and three houses adjoining were drained by a combined system into the main sewer. There was a stoppage in the drain, admittedly not under No. 9, but the Vestry summoned Mr. Greenfield because they contended that he had contributed to the nuisance by not agreeing to share in the cost of unstopping or providing his house with a separate drain. Mr. Greenfield was ordered to abate the nuisance on October 19th, since when the drain had been partially open. Mr. Fordham, in giving his decision, said that the contention of the defendant was that the order could not be enforced because the nuisance was not upon his premises; and, further, that the nuisance was in a combined drain, and upon land on which the defendant had no right of entry. All that, to his (the magistrate's) mind, was a quibble. He held that the combined drain was a part of 9, Quadrant Road, and that, a nuisance existing, it was the duty of the owner of No. 9, as well as the other owners, to share in the cost of the work. There would be a fine of £3 and £2 2s. costs; and if Mr. Greenfield was wise (added the magistrate) he would consent to pay his share of the necessary work.

Engineering Notes.

The new "Poplar Bridge" at Frizinghall, which connects the Shipley end of Frizinghall with the Crag end of Windhill, was formally opened last week. The bridge is of the lattice girder pattern and is 650ft. long and 7½ft. wide, having a plank flooring. Messrs. G. B. Smith and Co., of Glasgow, carried out the ironwork, and Mr. Robert Wood, of Bingley, the woodwork; the cost has been £1,250. The new bridge replaces an old, tortuous and dangerous footpath leading over the Bradford Canal and the Bradford Beck. It also passes over land purchased by the Bradford Corporation for the purposes of sewage treatment.

Institution of Civil Engineers.—At the ordinary meeting of the Institution held on Tuesday in last week Sir Douglas Fox, president, in the chair, it was announced that twenty-three associate members had been transferred to the class of members—namely, W. P. Abell, L. A. Bernays, jun., H. Blundell, A. Brebner, B.Sc., C. E. Brown, H. A. Brundell, G. B. Chalcraft, C. J. Crofts, H. S. Davies, J. Dewrance, E. W. Dixon, H. W. Hodge, S. H. Hunter, H. A. Mavor, R. G. Nicol, A. M. Paddon, C. S. R. Palmer, W. K. Parry, J. C. Peache, H. Pilkington, J. Swarbrick, W. Tower, and J. A. L. Waddell, M.E., B.Sc. It was also reported that 171 candidates had been admitted as students.

The Institution of Electrical Engineers held its annual dinner last Wednesday at the Hotel Cecil, when the president, Professor Silvanus C. Thompson, said that the Institution was about to form local sections in the provinces and in the Colonies to enable groups of members to hold meetings under the auspices of the society. Already such a local section had been in existence, informally, and had done good work in Cape Town. He referred to the offer of Mr. Wilde, of Manchester, to give £1,500 to a benevolent fund, and to the desirability of augmenting the building fund so that the Institution might very shortly provide itself with a home.

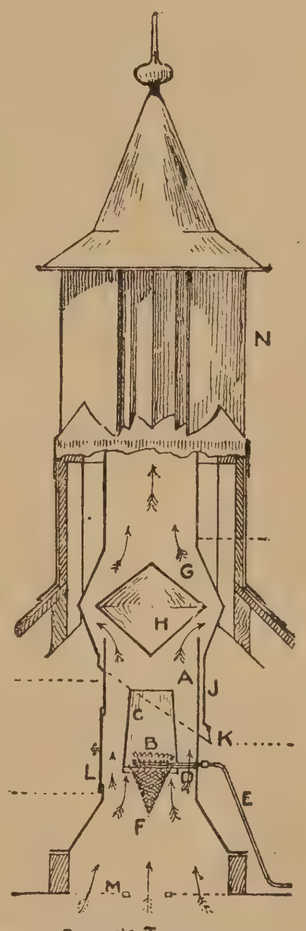
St. Helens Electricity Works.—At a special meeting of the St. Helens Electric Supply and Tramways Committee last week the electrical engineer submitted a statement showing the amount already expended on the electrical equipment of the tramways on the Prescot and Denton's Green sections to be £25,866. This was £866 in excess of the amount already authorised to be borrowed. The engineer also submitted his estimate of the cost of the electrical equipment of the Haydock and Peasley Cross sections, and of the extensions now being carried out.—It was resolved to apply to the Board of Trade for their sanction to the borrowing of the sum of £25,000, the total amount required for the purposes mentioned.—It was also resolved to apply to the Local Government Board for permission to borrow £20,000 to cover the cost for plant laid down and proposed to be increased at the Cropper's Hill power extension.

Death of a Southport Engineer.—Mr. James Robertson died at his residence, Holleth, Westcliffe Road, Birkdale, last week. He was born in 1821 at Farnell in Forfarshire, and received his training at Messrs. Randolph, Elder and Company's works, Glasgow. He subsequently became a partner in the firm of Messrs. Robert Laidlaw and Company, Glasgow, and after forty years residence in Scotland crossed the border and became associated with many important engineering firms in Birmingham, St. Helens, and Manchester. He was also at one time manager of the Camlachie Foundry, Glasgow. Mainly owing to his inventive faculties, many important improvements were affected in hydraulic machinery for the manufacture of tubes of all metals, and there are few concerns in the country which do not now avail themselves of Mr. Robertson's inventions. One of his last ventures was to establish the St. Helens Tube and Metal Company, which was subsequently disposed of to a Birmingham company known as Tubes, Limited.

Trade and Craft.

BOYLE'S THEROLITE.

The therolite is the latest patented invention of Mr. Robert Boyle, of Boyle and Son, Limited, ventilating engineers, of London and Glasgow, and is intended to assist the updraught in sluggish ventilating shafts and flues. It may be usefully employed in combination with the "air pump" ventilator for the prevention of condensation and the removal of exhausted steam from washhouses, laundries, drying-rooms, breweries, malt kilns, &c. It is also of assistance where ventilating shafts or flues are surmounted with ordinary cowls which fail to create a sufficient updraught and are subject to downdraught. When the "air pump" ventilator is employed, which creates at all times a powerful and continuous exhaust, the therolite is not so necessary. But when it is desired to make assurance doubly sure, it may be used in conjunction with the "air pump" ventilator, particularly for such buildings as mentioned above, as it superheats the cold steam or vapour at the point of exit and warms the ventilator and shaft, preventing condensation and accelerating the exhaust. The accompanying illustration shows the construction of the therolite: A, section of shaft of therolite 2in. larger than ventilating shaft; B, coil burner of improved construction, giving the maximum of heat with a minimum consumption of gas; C, cone for accelerating the velocity of the hot-air current; D, supporting rods; E, gaspipe; F, flame protector; G, expansion chamber; H, double spreader for deflecting the heated air on to the sides of the expansion chamber and diverting any down-current into the outer cylinder J, whence it passes through the valve K; the spreader also acts as a calorifier for superheating the up-current and further assisting the exhaust; L, door in shaft giving access to therolite (where the ceiling is not too high the therolite may be lighted from below by means of a taper and a long rod); M, ventilating ceiling panel, with opening in the centre to permit lighting from below; N, Boyle's patent "air pump" ventilator made fireproof. An arrangement may also be fitted to the burner to light the gas when it is turned on, thus doing away with the necessity and expense of a lighting jet or bye-pass.



BOYLE'S THEROLITE
as fitted to a Ceiled Roof.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—		
Dec. 15	South Kensington—Foundations, &c., to Victoria and Albert Museum.	Commissioners of H.M. Works and Public Buildings.	Sir John Taylor, H.M. Office of Works, &c., Storey's-gate, London, S.W.
,, 15	South Kensington—Foundations, &c., to Royal College of Science.	Commissioners of H.M. Works and Public Buildings.	Sir John Taylor, H.M. Office of Works, &c., Storey's-gate, London, S.W.
,, 15	Whitley, Northumberland—Council Offices	Urban District Council	J. P. Spencer, 13, Grainger-street West, Newcastle-on-Tyne.
,, 15	Abergavenny—Additions, &c., to Congregational Church	Building Committee	B. J. Francis, Architect, Abergavenny.
,, 15	Aberlour, Scotland—Dwelling-house	....	C. C. Doig, Architect, Elgin.
,, 15	Bredbury—Police Station	....	H. Beswick, County Architect, Newgate-street, Chester.
,, 16	Brydekirk, Scotland—Additions, &c., to Public School	....	— Irving, Clerk to Board, Kirtlebridge.
,, 16	Shirebrook, near Mansfield—Lock-up	Standing Joint Committee	J. S. Story, Surveyor, County Offices, St. Mary's-gate, Derby.
,, 16	Abingdon-on-Thames—Hospital	Joint Hospital Board	J. G. T. West, Architect, Abingdon.
,, 16	Bridlington—Business Premises	J. Wilcox	S. Dyer, Architect, Bridlington.
,, 16	Leeds—Taking Down Retort House and Chimney	Gas Committee	R. H. Townsley, General Manager, Municipal-bldgs., Leeds.
,, 16	Stramullen, Ireland—Additions, &c., to Parochial House	Rev. W. J. Davis, P.P.	A. Scott and Son, Architects, William-street, Drogheda.
,, 16	Tooreen, near Woodlawn, Galway—Dwelling-house, &c.	C. O'H. Trench	J. Smith, M.I.C.E., Ballinsloe.
,, 16	Leeds—Retorts, Firebricks, Fireclay, &c.	Gas Committee	R. H. Townsley, Municipal-buildings, Calverley-st., Leeds.
,, 16	London, S.E.—Bricks, Cement, Lime, Sand, &c.	Guy's Hospital	Superintendent, Guy's Hospital, S.E.
,, 17	Howden, Yorks.—Police Station and Court House	East Riding Standing Joint Committee	A. Beaumont, County Surveyor, County Hall, Beverley.
,, 18	Keighley—Hotel	T. Ramsden and Son, Limited	W.H.D.Horsfall, Architect, Tower-chbrs.,Silver-st.,Halifax.
,, 18	Leeds—Restoration, &c., of St. George's Church	....	H. Walker, 8, Upper Fountaine-street, Leeds.
,, 18	Paul, Cornwall—Infant School	School Board	H. Maddern, 26, Clarence-street, Penzance.
,, 18	Sedgley—Alterations, &c., to School	School Board	A. Ramsdell, Architect, Wolverhampton-street, Dudley.
,, 18	Troedyrhiw, Wales—Six Villas and Thirty-Six Cottages	Pontyrhun Building Club	G. P. Davies, Architect, Queen's-chambers, Neath.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDINGS—*Continued.*		
Dec. 18	Fleetwood, Lancs.—Schools	School Board	W. H. Haworth, 15, Mawdsley-street, Bolton.
„ 18	Isle of Thanet—Infectious Diseases Hospital	Joint Hospital Board	Franklin and Andrews, 25, Ludgate-hill, E.C.
„ 18	Romford—Laundry at Workhouse	Board of Guardians	R. L. Curtis, 119 and 120, London Wall, E.C.
„ 18	Willesborough Lees—Hospital Building	East Ashford Rural District Council	H. Hamilton, Clerk, 11, Bank-street, Ashford, Kent.
„ 19	Dearham, Cumberland—Repairs	School Board	J. Martin, Dearham.
„ 19	Frome—Stable	Great Western Railway Co.	Engineer, Great Western Railway Station, Bristol.
„ 19	London, E.C.—Underground Transformer Stations	Shoreditch Vestry	J. R. Dixon, Surveyor, Town Hall, Old-street, E.C.
„ 19	Thornhill, Yorks.—Goods Shed, &c.	Lancashire and Yorkshire Railway Co.	W. B. Worthington, Engineer, Hunt's Bank, Manchester.
„ 19	Wortley Junction, near Leeds—Engine Shed, Shops, &c.	Lancashire and Yorkshire Railway Co.	Engineer, Hunt's Bank, Manchester.
„ 19	Barking, Essex—Ejector Station, &c.	Urban District Council	C. J. Dawson, Surveyor to Council, Public Offices, Barking.
„ 19	Blaen Llynvi, near Tywith, Glamorgan—Station	Great Western Railway Company	Engineer, Newport Station.
„ 19	Burnley—Extension of Goods Yard, Offices, &c.	Lancashire and Yorkshire Railway Co.	W. B. Worthington, Engineer, Hunt's Bank, Manchester.
„ 19	Birkenhead—School Extension	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
„ 20	Farnworth, Bolton—Nurse's Home at Workhouse	Union Guardians	Bradshaw and Gass, 19, Silverwell-street, Bolton.
„ 20	Chiswick—Additions, &c., to Vestry Hall	Urban District Council	A. Ramsden, Surveyor, Vestry Hall, Chiswick.
„ 21	Pentre, Glamorgan—Infants' School	Ystradyfodwg School Board	J. Rees, Architect, Hillside Cottage, Pentre.
„ 21	Portknockie, Scotland—Boundary Walls	Rathven Parish Council	J. W. Gordon, Clerk, Buckie.
„ 21	London, S.W.—Alterations to Premises	Fulham Guardians	A. S. Snell, 22, Southampton-buildings, Chancery-lane, W.C.
„ 23	Cardiff—New Wards at Workhouse	Guardians	E. Seward, Architect, Queen's-chambers, Cardiff.
„ 23	Ovenden, Yorks.—House and Stable	....	Jackson and Fox, 7, Rawson-street, Halifax.
„ 23	Rastrick, near Brighouse—Rebuilding Inn	Halifax Brewery Company	W. C. Williams, 29, Southgate, Halifax.
„ 23	Gainsborough—House	Urban District Council	P. Griffith, 54, Parliament-street, Westminster.
„ 29	Richmond—Alterations, &c., to Laundry	Joint Isolation Hospital Committee	F. C. Greville-Smith, 172, High-street, Hounslow.
„ 30	Newcastle-upon-Tyne — Offices and Pupil Teachers' Centre	School Board	W. H. Knowles, 37, Grainger-street, Newcastle-upon-Tyne.
Jan. 3	Cilybebyll, near Pontardawe—Isolation Hospital	Pontardawe Hospital Committee	J. Morgan, Surveyor, Herbert-chambers, Pontardawe.
„ 4	West Hampstead, N.W.—Branch Public Library	St. John's Vestry, Hampstead	A. P. Johnson, Clerk, Vestry Hall, Haverstock-hill, N.W.
„ 6	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
	ENGINEERING—		
Dec. 15	Rathdrum, Ireland—Pump, Water-ram, Pump Well, &c.	Rural District Council	— Little, Civil Engineer, Rathdrum.
„ 15	Blackpool—Electrical Plant	Corporation	R. C. Quin, Corporation Electricity Works, Blackpool.
„ 15	Lincoln—Gas Manufacturing Plant	Gas Committee	J. Carter, Manager, Gas Offices, Lincoln.
„ 15	Langport—Reservoir, Pumping Station, &c.	Rural District Council	Bailey, Denton, Son and Lawford, Palace-chambers, 9, Bridge-street, Westminster.
„ 18	St. Just, Cornwall—Mine Engine and Air Compressors	....	J. H. Eustice, Engineer, Levant Mine, St. Just, Cornwall.
„ 18	London, E.C.—Electrical Plant	Midland Electrical Corporation for Power Distribution, Limited	G. Carpenter, 11, Cornhill, E.C.
„ 19	Blackburn—Reconstruction of Bridges	Lancashire and Yorkshire Railway Co.	Engineer, Hunt's Bank, Manchester.
„ 19	Hamilton, Scotland—Pipe-laying	District Committee	J. and A. Leslie and Reid, 72A, George street, Edinburgh.
„ 20	Brightlingsea, Essex—Waterworks	Urban District Council	W. I. Osborn, Foresters' Hall, Brightingsea.
„ 20	Birmingham—Pumping Engines & Pumps, &c.	Corporation	J. Mansergh, 5, Victoria-street, Westminster.
„ 20	Fishguard and Rosslare—Railways	Railways and Harbours Company	Sir B. Baker, 2, Queen-sq.-place, Queen Anne's-mansions, S.W.
„ 23	Blackburn—Electrical Overhead Line Equipment	Corporation	Lacey, Clirehugh, and Sillar, 2, Queen Anne's-gate, S.W.
„ 28	Gloucester—Electrical Plant	Electricity Supply Committee	R. Hammond, 64, Victoria-street, Westminster, S.W.
„ 29	Twickenham—Machinery, &c., at Hospital	Joint Isolation Hospital Committee	F. C. Greville-Smith, 172, High-street, Hounslow.
„ 30	Panama—Aqueduct	Authorities	Commercial Department, Foreign Office, Whitehall, S.W.
„ 31	Mistretta—Electric Lighting Town	Municipality	Commercial Department, Foreign Office, S.W.
Jan. 2	Llanelly—Reservoir	Urban District Council	H. W. Spowart, Clerk, Town Hall, Llanelly.
„ 3	Concepcion—Drainage and Waterworks	Chilian Government	Commercial Department, Foreign Office, Whitehall, S.W.
„ 4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
„ 26	Valletta, Malta—Waterway in Tunnel at Sea-level	....	Superintendent of Public Works, Valetta.
	IRON AND STEEL—		
Dec. 15	Hull—Iron and Steel, Castings, &c.	Corporation	A. E. White, City Engineer, Town Hall, Hull.
„ 16	Trimdon Grange, Durham—Iron, Steel, Castings, &c.	East Hetton and Trimdon Collieries	Storekeeper, Trmidon Grange Colliery, co. Durham.
„ 16	Douglas, Isle of Man—Steel and Iron Work	Gaslight Company	T. Newbiggin and Son, 5, Norfolk-street, Manchester.
„ 16	Manchester—Tie-bars, Bolts and Nuts	Tramways Committee	J. M. M'Elroy, Sec., Tramways Dept., Town Hall, Manchester.
„ 18	Margate—Stores	....	F. Stanley, Waterworks Office, Municipal-buildings, Margate
„ 19	London, W.—Steel Bridge Girders	Great Western Railway Co.	Engineer, Caddington Station.
„ 19	Hamilton, Scotland—Cast-iron Pipes	District Committee	J. and A. Leslie and Reid, 72A, George-street, Edinburgh.
„ 30	Donington, Lincs.—Fencing, &c.	Parish Council	A. G. Fletcher, Clerk to Council, Donington.
Jan. 6	Roscommon, Ireland—Water Mains	District Council	C. Mulvaney, Engineer, Roscommon.
	PAINTING AND PLUMBING—		
Dec. 15	Hull—Paints, Oils, Brushes, &c.	Corporation	A. E. White, City Engineer, Town Hall, Hull.
„ 16	London, S.E.—Sheet Lead, Pipes, &c.	Guy's Hospital	Superintendent, Guy's Hospital, S.E.
Jan. 6	Cardiff—Painting at Workhouse	Guardians	A. J. Harris, Clerk, Queen's-chambers, Cardiff.
	ROADS AND CARTAGE—		
Dec. 15	Newcastle-on-Tyne—Road Stone	....	County Surveyor, Moot Hall, Newcastle.
„ 17	Saddleworth, near Oldham—Materials	Rural District Council	J. Bradbury, Clerk, Union Offices, Upper Mill, nr. Oldham.
„ 18	Troedyrhiw, Wales—Roads, &c.	Pontyrhun Building Club	G. P. Davies, Architect, Queen's-chambers, Neath.
„ 19	West End, near Southampton—Kerbing	South Stoneham Rural District Council	J. Cudlipp, District Surveyor, Old Netley, Hound.
„ 20	Cromer—Improvement of Gangway	Urban District Council	A. F. Scott, Surveyor to Council, Church-street, Cromer.
„ 20	Felixstowe—Street Works	Urban District Council	G. S. Horton, Surveyor, Town Hall, Felixstowe.
„ 20	London, W.—Street Improvement Works	Chiswick Urban District Council	A. Ramsden, Surveyor, Vestry Hall, Chiswick.
„ 20	London, S.W.—Road Works	Fulham Vestry	C. Botterill, Surveyor, Town Hall, Walham Green, S.W.
„ 21	Kingston-upon-Thames—Flints and Roadmaking	Corporation	Borough Surveyor, Clattern House, Kingston-upon-Thames.
„ 25	Horsham—Broken Granite	Roads and Bridges Committee	W. B. Purser, 31, Bedford-road, Horsham.
„ 30	London, W.—Works and Materials	St. George's Vestry, Hanover-square	G. Livingstone, 1, Pimlico-road, W.
Jan. 1	Hastings—Road Metal	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
	SANITARY—		
Dec. 15	Durham—Scavenging	Rural District Council	Inspector, Wood View-terrace, Shincliffe, Durham.
„ 18	Nottingham—Sewer	Stoke Farm Committee	A. Brown, City Engineer, Guildhall, Nottingham.
„ 18	Westbury-on-Trym—Removal of Ashes	Barton Regis Rural District Council	H. T. H. Lancaster, Clerk, Barton Regis, Eastville, Bristol.
„ 19	King's Lynn—Disinfectants, Stoneware Pipes, &c.	Corporation	W. J. Weaver, Borough Surveyor, King's Lynn.
„ 20	Cromer—Sewer and Sewerage Works	Urban District Council	A. F. Scott, Surveyor to Council, Church-street, Cromer.
„ 21	Horsham—House Drainage and Sanitary Work	....	W. Buck, Surveyor, North-street, Horsham.
„ 23	Sonning, near Reading—Sewering	Wokingham Rural District Council	J. F. Sargeant, 8, Shute-end, Wokingham.
	TIMBER—		
Dec. 16	Trimdon Grange, Durham—Colliery Stores, &c.	Trimdon Coal Company	Offices, Deaf Hill Colliery, Trimdon Grange, R.S.O.
„ 16	Leeds—Timber	Gas Committee	R. H. Townsley, General Manager, Municipal-bldgs., Leeds.
„ 21	London, S.E.—Jarrah Timber	Lambeth Vestry	H. Edwards, Surveyor, Vestry Hall, Kennington-green, S.E.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Dec. 15	Lymm—Council Chamber and Offices	£25, £15	W. Mullard, Clerk to Urban District Council, Lymm.
Jan. 31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.
Feb. 28	Doncaster—Isolation Hospital	£25, £15	F. E. Nicholson, Solicitor, Union Offices, Doncaster.
Mar. 12	Belfast—Assembly Hall	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast.
No date	Glasgow—General Hospital for 1,200 patients	£200, £150, £50	J. R. Mortion, 38, Cochrane-street, Glasgow.
„	Harrogate—Northern Police Covalescent Home	....	Hon. Secretary, St. Georges, Harrogate.

Property and Land Sales.

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STREATHAM.—Norfolk House Estate.—Important and valuable Freehold Property, with possession, containing about 15 acres and 24 perches, with frontages to main roads, and offering unequalled advantages for development as a building estate. By order of the Trustees under the will of the late Christopher T. Gabriel, Esq.

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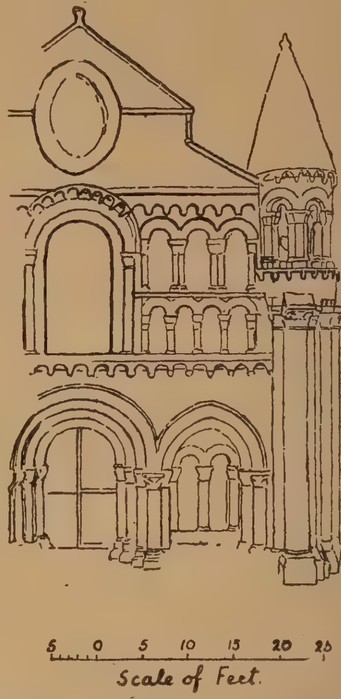
NOTRE DAME LA GRANDE: POITIERS: WRITTEN AND ILLUSTRATED BY T. M. ROOKE.

> "Look up and wonder
> At what the men did for us, who are dead."
> *William Morris.*

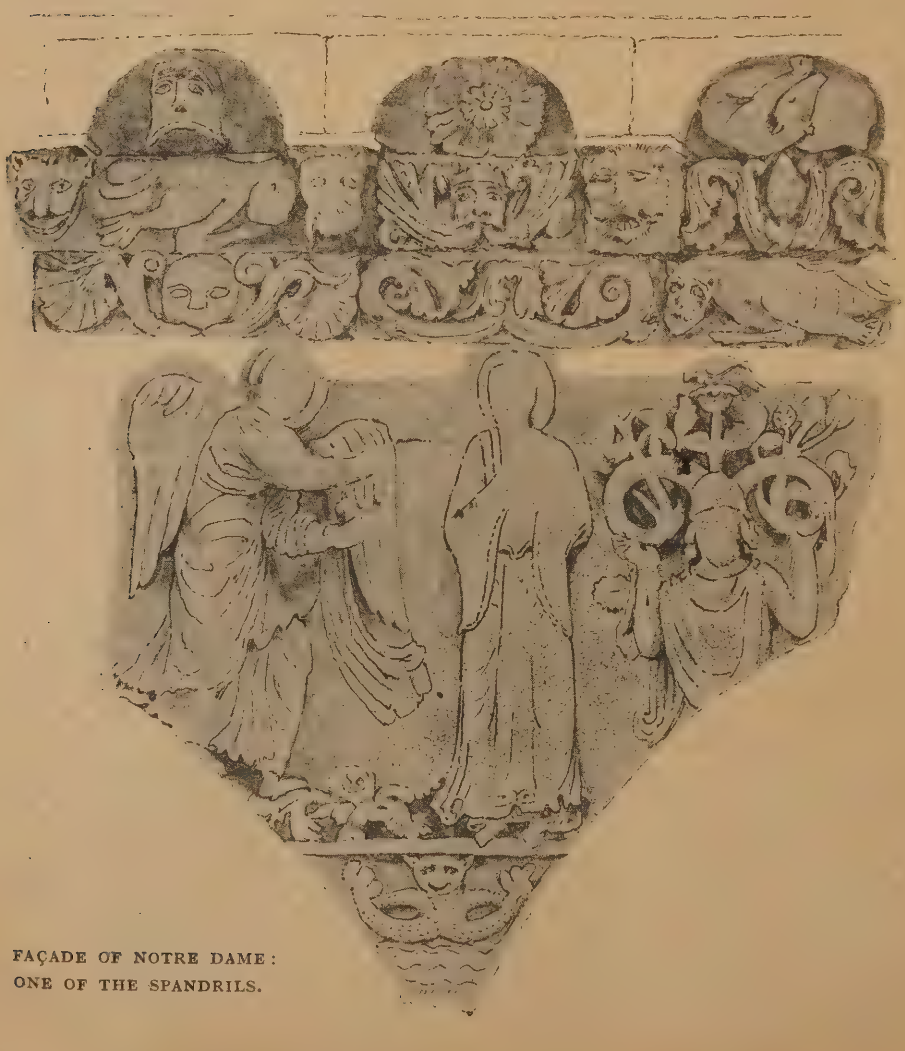
AND wonder we may, too, at such a hardly possible looking piece of antiquity still existing in the midst of modern life, with the untraceable charm in it of the childhood of mankind; of the traditions of Etruria, Rome, and Byzantium, imported by workmen still imbued with them.

That from the south these men must have come, no one can doubt who looks at the building; or that remoteness of locality from central influences of change is, as much as remoteness in time, the reason of its strangeness, as would appear from the date, 1099, given for its foundation.

To many the style of this church is rather a surprise and a puzzle; it is, however, the northernmost of a noteworthy group of sister churches centering in that of Angoulême, the family likeness, as not seldom happens, being, perhaps, more traceable in the disposition than in the appearance.



NOTRE DAME, POITIERS.



FAÇADE OF NOTRE DAME: ONE OF THE SPANDRILS.

* * *

The article from which the above is extracted is one of the most interesting in the current issue of THE ARCHITECTURAL REVIEW. The article is freely illustrated, and there is, in addition, a double-page plate of Notre Dame la Grande, taken from a water colour drawing, given as a supplement to the number. There is also an excellent coloured supplement: "A Spanish Garden," from the original painting by A. T. Griffith. Amongst the other purely architectural features of the number are articles on "The Houses of Parliament," by Paul Waterhouse; "From Holborn to the Strand: An Ideal Street," by Mervyn Macartney; and "Jerusalem from an Architectural Point of View," by T. R. Spence. The whole makes one of the best Art Annuals published this season. The price is ONE SHILLING.

THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
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DECEMBER 20, 1899.
No. CCLIV.

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STRAND, W.C.

An Architectural Causerie.

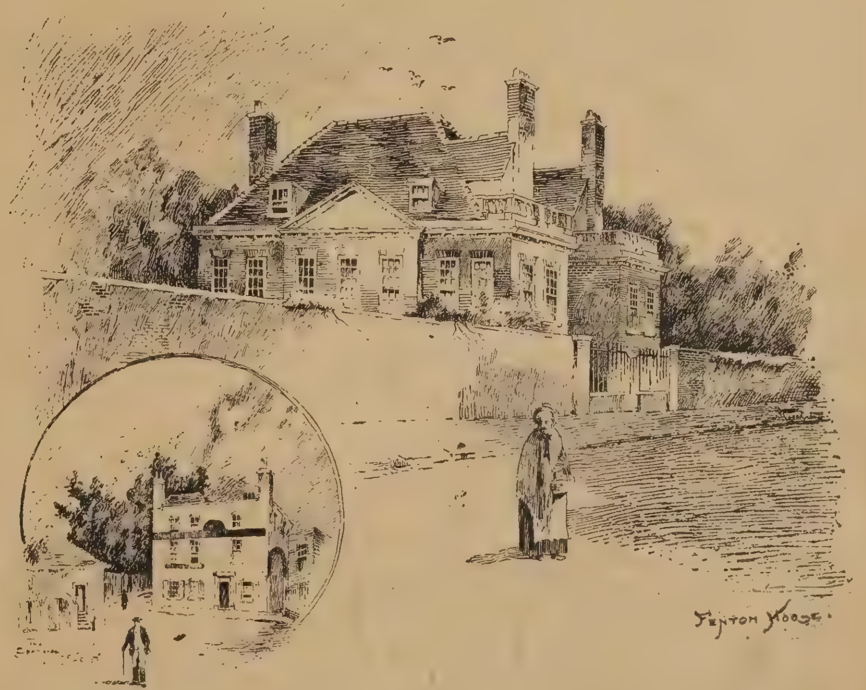
The Art of Turner. IT is a well-worn and unctuous platitude that says in many and varying ways that "genius will out," or "genius cannot hide its light under a bushel." Its frequent repetition from the lips of plagiarists of all ages and without distinction of class, has, doubtless, by no means endeared it to the majority of readers. These plagiarists seem to have secured a vested interest even in some of our few universal truisms, turning them into dry-as-dust formulas. Yet, because this is so, we must not let pass without acknowledgment the truth which underlies them, and there is a truth beneath the ones I have quoted which well deserves examination. Precisely eighty years ago Turner, yet a novice in his art, made his first visit to Italy. This date for me has always marked the beginning of a new régime in the art of our English colourists; for it is from that year onward to his eclipse that Turner produced those dreams of exquisite colouring and extraordinary imaginative power, which are generally acknowledged to be unequalled by any exponent of our art, and, as some would have it, by the exponents of any other art also. It is not this, however, which alone will prove the truth of our platitude, but it is the rise of Turner, almost unaided, from his small beginning and the miniature realm of his first efforts into the wide sphere of universal application.

The main facts of his life are known to everyone. His birth into a plebian, uneducated family; his first satisfaction with the hack-work his genius easily procured for him; and, finally, his soaring ambitions, which urged him onwards to surpass Claude, Wilson, Vandevelde, and even attempt to rival Titian in his colour and draughtsmanship. Endless battle and discussion have waged with varying success upon this phase of his career, but here it would be obviously out of place to pursue it. Yet that he surpassed Wilson and even Claude in his masterpieces, is widely accepted, but the doubt as to Vandevelde has been powerfully expressed, while the arrogance of his competition with the great Venetian master, Titian, has met with a somewhat just outburst of ridicule. The power of Turner's art was purely imaginative; alone it would have served him little, but behind there was an extraordinary conviction of the innate morality of Nature, if I may use such a phrase. He was throughout all his efforts the exponent of the unintelligible morality expressed, as he thought, by Nature in all her moods. This has made him the living force and vitality in art, that has brought to him the intense love, and strong hate, of different personalities; by few, if by any, has he been ignored or regarded with indifference.

It has been noticed of his work, that even by a marked divulgence from the actual lines of a landscape he caught and expressed the prevailing idea or emotion such a landscape usually conjured up. His treatment is the antithesis to that of Millais in his "Chill October," that photographically correct rendering of a bleak moorland scene, where the artist has absolutely failed to convey the predominant idea of the subject. It might almost be said of Turner that he entered into the forces of Nature; her beauties and secrets he claimed as a natural heritage, and these he has given to the world in his wonderful colour poems. Had Coleridge been a painter instead of a poet he would have been a second Turner, with, perhaps, more of human interest—given him by his far higher education. It must be realised that Turner was in no wise a scholar, or even had the advantage of a good education. His acquirements were all the result of the fire within him, which consumed his ignorance until he saw Nature as few men have been privileged to see her. He saw her with the veil fallen from her figure, striving for the ultimate happiness of mankind, and in almost every picture he has immortalised one of her moods. His "Liber" drawings are the most powerful and most successful series any painter has produced. They are a complete work as a critical and appreciative interpretation of Nature. So intimately connected are they that it would be an injustice to separate one from another and judge them apart. These sepia drawings, even without his work upon their reproduction, would alone give him a claim on posterity; yet when we consider the mass of his painting, the extraordinary volume of his work, differing and advancing from day to day, the genius of the man seems almost immeasurable.

For a discussion of the individual excellence of his work, we can go to no more sympathetic critic that Mr. Ruskin, yet it will be seen that even the beautiful language at his disposal sometimes fails to applaud sufficiently those paintings of final excellence. Worthy Thomas Malton, whose only claim to notice is because of his dismissal of Turner as a bad perspective draughtsman, would be somewhat dismayed at his foolish error, did he know the present-day appreciation of Turner; but there is always, in the history of every great man, a Thomas Malton who demonstrates to the world the futility of immature judgment. Much is there in the life of Turner of tragic interest. He had been played a sorry trick by Nature, in making him in spirit the apostle of noble romance and high imaginative art, while in body a small pitiably ignoble figure, only retrieved from the commonplace by the clear cut profile and wild restless eyes. To a man of his sensitive nature this must have been hard to bear, and added to it was his lamentable lack of expression, which a good education would probably have eliminated. Two such things as this may seem small to us when compared with his genius, but his highly-strung and nervous artistic nature doubtless magnified them into insupportable obstacles to fame; and those increasing voluntary withdrawals from his surroundings into solitude were most probably influenced by this. That the ending of such a man drew near unto madness cannot be regarded as strange, for he saw too clearly for ordinary life, too deeply to be unaffected by it; and the weak flesh finally revolted against the supremacy of the spirit. "If you would live happily," says a German sceptic, "see without understanding and hear without knowledge," and this Turner could never do.

F. B.


FENTON HOUSE.

TWO HOUSES AT HAMPSTEAD. DRAWN BY FREDERICK ADCOCK.

Two Hampstead Landmarks. FENTON HOUSE, Hampstead, which is illustrated on this page, is situated in The Grove, a thoroughfare leading to Hampstead Heath. It is known locally as "The Clock House," as in former times there was a clock on the front of the building. This is now replaced by a sundial. The house is a very good example of the Queen Anne's style.

"The Spaniards," Hampstead, stands on the border of the Heath, on the site of a lodge once occupied by the keeper of Caen Wood House. Various reasons are given for the uncommon name of this well-known tavern. It is said by some to have derived its name from having been once inhabited by a wealthy Spanish nobleman, and by others because it was once taken by a Spaniard and converted into a house of amusement. It was the landlord of this inn who stopped the mob during the Gordon riots, by throwing open his cellars and allowing the men to help themselves, thus detaining them until the military arrived. Both illustrations are by Mr. Frederick Adcock.

Open Spaces and Buildings.

THE reaction from crowded courts and narrow lanes, the desire for more light and air, the necessity of relieving traffic, have led to a general rebuilding of modern towns, and the results have been favourable to health and comfort. They do not always, however, make for beauty. The architectural effect of towns depends upon proportion, grouping and fitness. Proportion must be applied not only to the different features of buildings but to the general design of the structure and the space before it, especially in regard to height; this must also be treated with some reference to the height of neighbouring structures. Too great an open space will often neutralise the grandeur of a very fine building; its effect is invariably to dwarf it, and the principle is absolute that buildings and spaces must be proportioned to each other. One exception is permissible to this—in the case of parks or of boulevards of the immense width of those of Brussels, which are practically strips of parks; no relative proportion can exist there. The most thorough-going rearrangement and rebuilding of modern times is that of Paris; the height of houses fronting upon a street was limited under Baron Haussmann to 60ft. and open spaces were made wherever practicable; when laid out as gardens the designs were due to M. Alphand, whose parterres and ivy borders set the fashion to all Europe. As the rebuilding progressed many old buildings were swept away, others were "disengaged" on one side, some were completely isolated. These last often presented a barren and awkward appearance, suggesting the text without the context, for they had never been designed to be seen thus—the truth is that an urban building is a picture, and it must not be taken out of its frame. Another change due to the Haussmann régime was the substitution of smooth asphalte for the uneven roads and pavements of old Paris, a great comfort to men if not to horses, but one that should not have been applied to every place indiscriminately. It was laid down on the historic *Parvis*, the space in front of Notre Dame, and the result is unsatisfactory; every atom of light and shade has disappeared; the walls of the cathedral rise from a smooth, polished area of featureless grey. The place is still further marred by the merciless straight lines of the tramway and the great beauty of the church is lessened by an appearance of being over-restored and over-isolated. Better far the little strip of honest turf and the few trees which partly screen Westminster Abbey and thereby heighten its effect, the grass running right up to the walls and contrasting with them. Of modern open spaces in London other than parks two may be named as failures through want of proportion; one is Hyde Park Corner and the other Cambridge Circus. The complete disregard for architectural effect in the position of the Arch and its consequences are only too well known. Cambridge Circus is absolutely unpardonable, for what should have been the finest *carrefour* in mid-London is essentially mean and confused. Nash, with all his faults, could have done better than this.

J. C. P.

On Reflection.

The Classic Spirit in Architecture.

IT will be remembered that we referred quite recently to the proposal to establish a British school at Rome, and it is in connection with this scheme that the late president of the Royal Institute of British Architects, Professor Aitchison, writes to the "Times" to point out what a loss it is to Architecture that such a school does not exist. He says in one part of his letter: "In spite of the enthusiasm for Roman work in the fifteenth and sixteenth centuries no one was found to explain the Roman method of building till that illustrious engineer, M. Auguste Choisy, published his celebrated 'L'art de batir chez les Romains' in 1872, and we still want to know from whom the Romans took their methods and the real dates of the remaining Roman buildings and ruins at Rome." With this desire to discover more and more of the methods of the old builders who founded such a noble school no one will surely disagree, for such knowledge could not but benefit Architecture. But from Professor Aitchison's views that British students should recognise the importance of measuring the Roman monuments, and, it may be taken, become classicists, a great number will differ, for it must not be forgotten that there is a large section of architects who cry "not backwards with stereotyped models, but forward with an original purpose." Then later the professor says that "as the architecture of Greece is the most perfect the world has seen, the study of this primitive and perfect architecture is as important to architects as the study of their unequalled literature is to poets and scholars." This is admirably expressed and perfectly true, though it needs, perhaps, for some students, to be qualified by a word of warning against a pedantic spirit. The study of ancient examples is worse than useless if it leads only to slavish imitation. The student's aim should be to discover the principles underlying the great work of the past and to adapt those principles with judgment and discrimination to the needs of our own times.

The Dewey Arch.

WHAT a great deal the Chicago Exhibition did for America. Apart from the temporary benefits derived by the tens of thousands who were connected with it, there have been some results effected wide in their influence, strong in impetus and holding out fair prospects for the future. Foreign architects who saw the exhibition were amazed at the quality of the buildings erected, having always considered their American confrères as being rather crude in their ideas and without artistic instinct. It also did much good for the American sculptor. Until a few years ago, the art of sculpture had never been properly appreciated in the country, but, then, the exhibits brought home to the people how great was the work of the sculptor, and the National Sculpture Society has since kept up the interest excited by holding some unique art exhibitions. Their crowning effort has been the Dewey arch, and it is considered by some that when this has been completed in durable material (for it is now a plaster structure), the American School of Sculpture may be said to have become emancipated, its future progress being even more rapid than during the past decade. It is not so very long ago that to American sculpture could be applied that epitaph, so abhorrent to many here, "made in Germany"; but things have now turned round and in future it will be the production of the home artists that will beautify or disfigure the view; and this is only right, for the German sculptures were characterised by that quality possessed by articles that are turned out "in quantity," a quality which, in sculpture of all things, would be especially displeasing. The Dewey Arch is the product of all the chief sculptors of America, who volunteered their services and spent about six weeks on the work. In its main lines the arch is an enlargement of the Arch of Titus, and has eight colossal figures of naval heroes, the whole being surmounted by a group representing Victory; a colonnade is combined with it also. We are glad to note that the twenty-five sculptors who produced it worked together in entire harmony and unison.

Must Machine-made Things be Ugly?

MR. CHAMBERLAIN'S recent speech at the distribution of prizes at the Birmingham School of Art (reported in last week's issue), was, like most of the speeches of that gentleman on non-political subjects, stimulative and thought-provocative to a degree. With most of his criticisms and deductions we heartily agree; but in one instance the right honourable gentleman came very near to an error, and that was when he implied that articles turned out by machinery were almost of necessity inartistic, ugly and vulgar. This need not be so, and in many cases it is not so. Of course, we do not mean to imply that a machine-made article can compete in that indefinable quality with which the personality of the craftsman endues hand work, but we do postulate that given a good original design, there is no real reason why that design should not be reproduced thousands of times by machinery. A design is not necessarily bad because it is common; a brick is not of necessity a bad or an ugly thing because it is used in the majority of buildings, and many hundreds of times in a single house! Such a machine made article, whether it is a door or a skirting-board, while not possessing the advantage of rarity, or of testifying to the owner's riches, may yet possess the qualities of fitness for the work it has to perform and appropriateness to its surroundings, and may be of pleasing design. Whilst in Nature we are told that there are not two leaves exactly alike, we know that oak leaves resemble each other and the leaves of every other oak tree of the same species, so that an oak leaf can never be taken for anything else, and yet oak leaves are never ugly or inartistic, and, though we walked through a whole forest of oaks and saw millions of oak leaves, we should never think them vulgar! In workmen's dwellings, in cheaper suburban houses, we are bound to have many of the fittings and much of the furniture of the same stock pattern, because they are cheap, but they need not be vulgar in a bad sense because they are common. No! Let the manufacturer, the maker of deal doors, of iron stoves, of ware finger-plates, or whatever it is, select a good, effective and artistic design, and then he may turn them out till further orders. One does not expect wrought-iron stoves and hand-painted finger plates in a labourer's cottage or a cheap terrace house; but there is no reason why the stove or the door-furniture should not be designed on sound artistic lines and conform to the canons of good taste. The original design being a good one, serviceable and artistic, the more reproductions of it the better—better that is than a greater variety of bad ones. There is nothing essentially vulgar or demoralising to the artistic instinct in the knowledge that another man has, or a hundred other men have, a door panelled like your own, or a stove made on the same pattern. The only essential point is that the original design be a good one; only the rich can afford the dubious blessing of possessing an article, the counterpart of which does not exist anywhere else in the wide world.

THE "RISING SUN," WYCH STREET, AND HOLYWELL STREET, STRAND. DRAWN BY HANSLIP FLETCHER.

THE STRAND.

By JOHN HEBB, F.R.I.B.A.

> Come Fortescue, sincere, experienced friend,
> Thy briefs, thy deeds, and e'en thy fees suspend;
> Come let us leave the Temple's silent walls,
> Me business to my distant lodging calls;
> Through the long Strand together let us stray,
> With thee conversing I forget the way.
>
> * * * * * *
>
> There Essex' stately pile adorned the shore,
> There Cecil's, Bedford's, Villiers', now no more.
>
> GAY TRIVIA, 475-92.

THESE lines were addressed by Gay in 1716 to his kinsman and schoolfellow William Fortescue, Q.C., M.P., and afterwards Master of the Rolls. Fortescue had chambers in the Inner Temple, having removed there from the Middle Temple in 1714, and Gay's "distant lodging" was in Whitehall, where he had apartments assigned to him by the Earl of Lincoln, a privilege which Gay appears to have lightly esteemed as below his merits; but inasmuch as he never wrote anything which was of service to the court, and was the author of the famous line in the "Beggars' Opera":—

> "That Jimmie Twitcher should 'peach I own does surprise me."

(which everybody applied to Lord Bute), Gay's lodgings in Whitehall and the commissionership of lotteries, with a salary of £150 a year, which he obtained in 1722, appear to us at the present day to have been a not inadequate reward for his not very strenuous labours, Gay never having been a politician.

The Strand must have been from the earliest times an important thoroughfare; it is said to have been first paved in the reign of Henry the Eighth, although, in 1353, John de Bedeford, of London, was appointed commissioner for paving the road and relaying the foot pavement; but it is possible that this commission, like other commissions we have heard of, accomplished nothing.

Up to the time of the Reformation, the Strand was a favourite place of residence of the bishops, who, being protected by their cloth, could afford to live outside the city walls; but in Tudor times, as Spelman says, the bishops' houses were taken from them by courtiers without any recompense, and the stately mansions of the hierarchy on the banks of:—

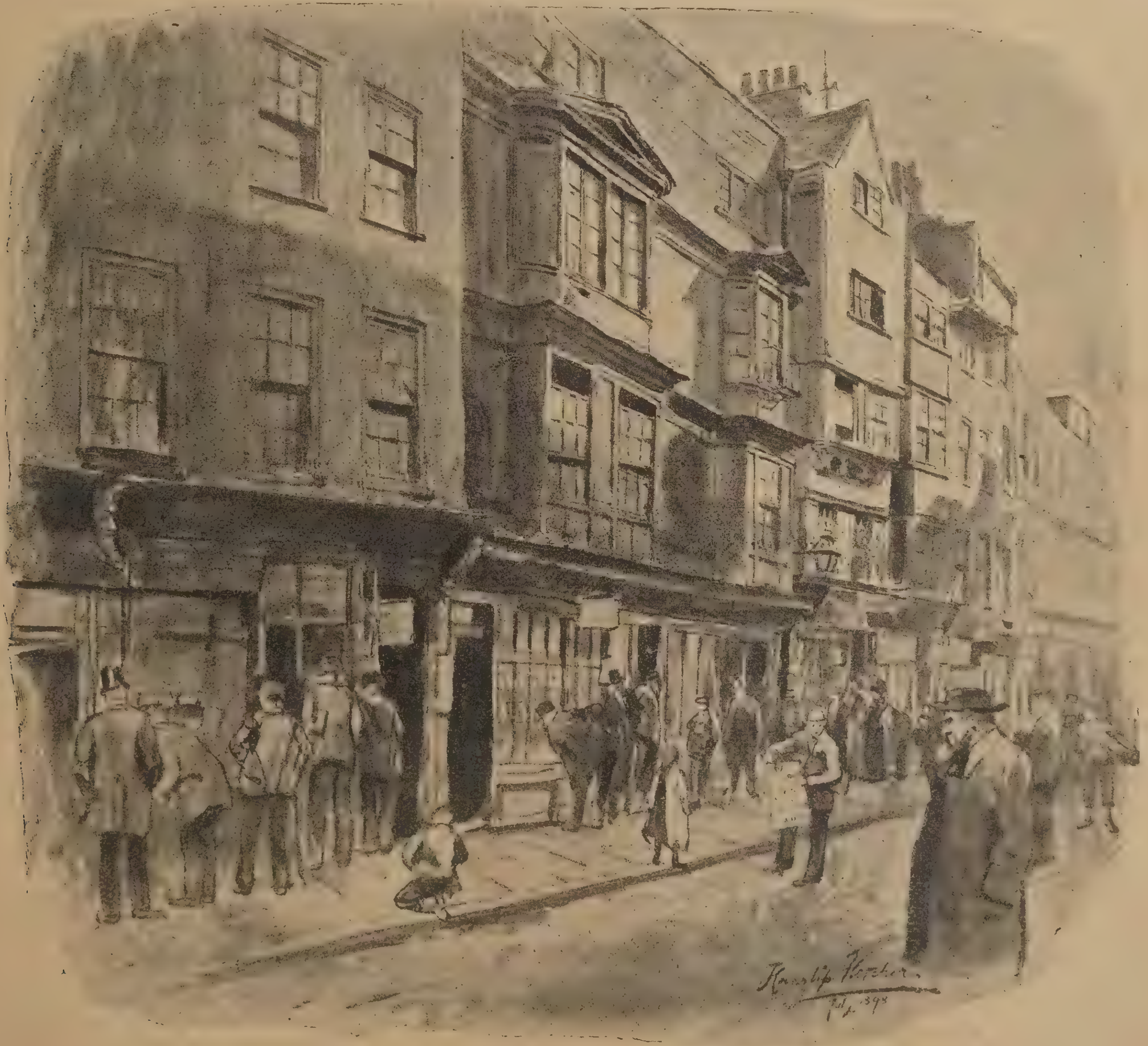
> "The clear Thames, bordered by its gardens green,"

sloping to the river, with their terrace walks and watergates, passed into the hands of the nobility, who, in their turn, alienated their pleasant domains or let them to speculating builders.

The Strand has always been celebrated for its pageants and has witnessed the passing of Queen Elizabeth to St. Paul's to return thanks for the destruction of the Spanish Armada, and of Queen Anne on the occasion of the Victory of Blenheim, the procession of George III. on his recovery, and the funerals of Nelson and Wellington.

Allen, in his history of London, says that there was no continued street here until about 1553 (temp. Mary), so that Elizabeth's progress from Charing Cross to Temple Bar, after the defeat of the Armada, could scarcely have been a very pleasant one. The side next to the Thames consisted at that time of distinct mansions screened from the vulgar eye by cheerless extensions of massive brick walls. The north side was formed by a thin line of detached houses, each of which possessed a garden at the rear; all beyond was country, St. Giles's-in-the-fields being a distant country hamlet.

The building shown in the centre of the small illustration on this page is the Rising Sun public house (No. 37, Wych Street, at the eastern end of Holywell Street), which is of the time of James the First, or probably earlier, and is said to be haunted by a ghost in the shape of a white lady. The large building on the left of the illustration of the Strand, looking westward (*see* p. 305), is Messrs. W. H. Smith and Sons' premises at the corner of Arundel Street, erected by Mr. W. H. Smith, the founder of the



HOLYWELL STREET, STRAND, W.C. DRAWN BY HANSLIP FLETCHER.

business, from the designs of Mr. H. R. Abraham, architect, the brother-in-law of the first Lord Westbury, hard by the site where

> Arundel's famed structure reared its frame,
> The street alone retains an empty name,

the structure (Arundel House) having been pulled down between 1670-80.

The buildings on the right side of the illustration, some of which retain something of their old picturesqueness, will shortly be swept away to make room for the new street from Holborn to the Strand.

The spire seen in the distance is the spire of the Church of St. Mary-le-Strand, built between 1714 to 1723 by Gibbs; it was his first work. The portico, imitated from the Church of Sta. Maria della Pace at Rome, has been much admired, but is not, perhaps, the most successful part of the composition, which is at once refined and dignified. It was originally intended to erect a column 250ft. high, with a statue of Queen Anne on the top, about 80ft. from the west front of the church; but, as the Queen died before the church was completed, this project was happily abandoned. Some illustrations of old Wych Street were given in No. CCXLVII. of the BUILDERS' JOURNAL.

"St. Clement's Church," says Leigh Hunt (see "The Town," page 146), "was rebuilt towards the end of the century before last by Edward Pierce, under the direction of Sir Christopher Wren, but it is a very incongruous, ungainly edifice. Its best aspect is at night time in winter, when the deformities of its body are not seen and the pale steeple rises with a sort of ghostliness of grandeur through the cloudy atmosphere." The Strand near the Outer Temple was much affected, in the last century, by persons connected with the theatre. Congreve lived in Surrey Street, Mountford the player (killed by Lord Mohun) in Norfolk Street, Mrs. Bracegirdle, "the brown," in Howard Street, and Mrs. Barry somewhere near her.

REGISTRATION OF ARCHITECTS.*

By ELLIS MARSLAND.

IN introducing this question I must necessarily go over some ground with which you must all be familiar and define what we mean by registration. *In the present* it means that every man practising architecture will be duly enrolled in an official register under an Act of Parliament and be duly responsible for his professional actions, and that no one be allowed to practice until he is duly enrolled. *In the future* it means that no one will be allowed to practice architecture until he is duly qualified and has been found so by undergoing a qualifying examination. It means, in fact, little more than making the Institute examination compulsory by Act of Parliament. It is a matter for surprise that this obvious benefit should not have been secured to the profession long ago, seeing the advantage it has been to the learned professions of law and medicine.

It is not my intention now to say one word by way of recrimination against the Institute, but I would just like to point out how far it has gone in the direction of registration. On May 30th, 1890, it passed the following resolution:—"That while not opposed to the principle of compulsory examinations as applied to those about to practice architecture, the Institute is of opinion that the difficulty of restricting by statutory powers the practice of architecture to those who have passed an examination is at present so insuperable that it is undesirable to make an immediate application for such powers." To what does this resolution amount but the admission that the principle is a good one and that the difficulties in the way are the only bar to progress. Why do we band ourselves into societies and associations unless it be for the express purpose of overcoming difficulties and bringing about reforms for the general good? This inactivity is placing the Institute in a false position and is causing a vast amount of dissatisfaction, especially among provincial members, as the want of such a measure of reform is felt far more keenly by them than by us. Of what use is it for the Institute to say that their examination is a panacea for the existing evils, unless this examination is made compulsory? Until men find that by undergoing a course of study and passing an examination they are placed in a better position in the eyes of the public than the man who possesses no qualifications at all, it is very unlikely that an appreciable number of men will voluntarily come forward and avail themselves of this means of entering the profession.

Now the position of the practice of architecture in this country at the present time is this—Any person with or without a fair general education, any builder, builder's foreman, clerk of works, clerk in a Local Board office, auctioneer, undertaker, &c., with the sole qualification of being able to provide a brass plate, is at liberty to advertise himself as a person qualified to give advise to the public in the science and art of architecture. Builders, decorating firms, and others going out of their proper province, boldly proffer their services as architects to their customers gratis, and the apparent saving of 5 per cent. is not to be resisted; while it is well known to those behind the scenes that an architect or architectural assistant is deviling in the background and his services are kept out of sight; but the customer has to pay all the same. Can it be a matter for wonder that architects are still unrecognised while such a condition of things exists, for at present the public have no guarantee that the class who call themselves architects are any better qualified to plan and design their buildings than the contractors who erect them, and should they employ an architect they have no means of ascertaining that his knowledge is greater than that of the builder, and the only certainty about it from their point of view is they will have to pay the professional charges.

But what the Institute have omitted to do the general body of practitioners are endeavouring to do for themselves. On April 6th, 1886, a meeting of architects was held in the Freemasons' Tavern in London, attended by members of the Institute, Society of Architects, and by practitioners not connected with any society, and a committee was then formed called "The Architects' Registration Committee" to give effect to the following resolution then and there passed:—"That it is the opinion of this meeting that instructions be given to the committee to consider the means necessary to obtain an Act of Parliament making it compulsory for all architects to hold a Government diploma." This committee was composed of Institute members, members of this Society and independent members, who set to work and eventually framed the Bill at present before Parliament. There is an erroneous opinion abroad that this is the Society of Architects' Bill, and I wish to correct this impression. That the Bill receives its cordial sympathy and support is no secret, but it is not the Bill of this Society, and never has been, and the Society reserves to itself the right to be heard in committee when this stage is reached with a view to certain amendments.

To put the matter shortly, the advantages arising from registration are these:—(1) Closing the doors to incompetent men; (2) raising the standard of the profession; (3) obtaining the confidence of the public and State recognition.

It is not proposed for one moment to say all who desire to build should employ an architect, but what we do propose is that henceforth in the interests of the public no person shall be entitled to call himself an architect whose name is not enrolled as qualified under an Act of Parliament, and any person wishing to employ an architect may, by consulting the official register, ascertain what men are qualified.

I will now deal with the objections. Objection has been urged against the movement that it will create a monopoly and thus be opposed to the principles of modern legislation, but there cannot be a monopoly created where it is made possible for anyone who proves himself qualified to share the rights. Another objection is that it will be necessary at the outset to register some of the very men who have caused all the mischief. This is very true, and unless this is done it will be found that Parliament will not listen to you. That you must respect vested interests is an axiom of Parliamentary practice, and when a man can show that he has practised architecture Parliament will say that you must not deprive him of his rights, and the obstinate attempt to exclude this principle from the Medical Act was the chief cause of delaying its passage through Parliament for thirty years. Another conscientious objector is the artist architect, and I should like to introduce you to this gentleman. Outwardly he is an individual with long hair and a red tie, who has a dreamy far-away look, which rude people call vacancy, and drivels about his beloved art and its soul inspiring influence; he cannot demean himself to consider such questions as rights of light or party walls, all of which he considers do not come within his province and are relegated to the mere surveyor. His specifications are left to the quantity man, his construction to the builder, or clerk of works, his sanitary work to the plumber, and his lack of acquaintance with the building by-laws is painfully brought home to him when he discovers his pretty pictures cannot be realised; his time is spent in his office making drawings impossible of execution, or else in designing sprawly wall papers or uncomfortable furniture. This is the gentleman who tells you the art of architecture requires none of your registration, that you are only lowering its dignity by making it a profession.

But, gentlemen, I maintain that at the present time architecture is trailed in the dust at the heels of many men who are unworthy of the title of architect, and by a scheme of education and registration we shall raise it above its present unsatisfactory surroundings to such a height as will at least bring it to the level of the learned professions, and after this has been attained then develop and foster the artistic side as much as you will and the more the better.

That you cannot examine a man as to his artistic attainments, is partly true. But a painter is no less a painter because he has been instructed in the science of perspective, or in the proper manipulation of his colours and their chemical composition. Or a sculptor is none the worse for a complete course of study of the anatomy of the human figure. We do not, of course, claim that architects can be manufactured from study and examination, but what we do claim is that there is a constructional, hygienic and scientific side to this question, which is of quite as much importance as the artistic, but which, unlike the arts of painting and sculpture, affects the comfort, health and well-being of the community; and this being the case the men who take upon themselves the responsibility should prove themselves competent. When we dislike a picture it can be relegated to the garret or given away to our friends; when a piece of sculpture displeases us a few blows with the hammer and it is made useful for the garden path. But it is a much more serious matter with our dwelling-houses if, when erected, whatever their architectural merit may be, they are found unfit, by reason of faulty construction or the wrongful disposition of the rooms or fireplaces, or on account of the sanitary arrangements being unsound and the ventilation bad.

The question of architectural taste is always a changing quantity and what may be one man's meat may be another's poison in this respect, so that it is not pretended that it is desirable to examine on the artistic side of architecture, even if you could find artistic examiners who would be agreed on any one point. The first effect of a Registration Act would be to put a stop to any further increase in the number of incompetent practitioners, and thenceforth they would become a diminishing quantity.

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* A paper read before the Society of Architects on December 14th, 1899.

ARCHITECTURAL ASSOCIATION.

THE STREETS AND BUILDINGS OF OLD LONDON.

A MEETING of the Architectural Association was held at the rooms in Conduit Street on Friday evening last, Mr. G. H. Fellowes Prynne being in the chair. After the minutes of the last meeting had been read and confirmed, Messrs. H. B Smith and J. S. Blunt were elected members of the Association. A list of nominations was then read, after which Mr. Andrew Oliver read his paper on "The Old Streets and Buildings of London" as follows, first describing a number of slides illustrating his lecture :—

HOLYWELL STREET, STRAND, W.C. DRAWN BY HANSLIP FLETCHER.

In attempting to give in a short paper an account of some of the streets and buildings of Old London one is perplexed at the outset not so much as to what should be retained, but what should be omitted. There are so many ways of dealing with the subject - so many ways of looking at it. The streets of London, full of interest and of information as they are, would be entirely lacking these qualities were it not for the histories which have gathered round the buildings which London formerly possessed. The history of a city is built up by its buildings and the inhabitants who have occupied them; but it is chiefly in the edifices of the past that we are enabled to discover the monumental history of its past. We have a few scanty remains of the Roman period, and a few of the ruined and desolated monasteries and of the early churches, which were to be found here, and we can also, in the names of its streets, trace the gradual changes which certain neighbourhoods have undergone, and even the few remains we have of a past period are getting less and less every year, until at length the only records that will be accessible will be found amongst the drawings of the antiquary and the pages of the historian. One has to read the work of John Stow to realise what we have lost in the way of ancient architecture; but few buildings given by him are now in existence. The destruction of these historical documents has been so complete that when one reads the account of London in the days of Henry VIII. it seems like a fairy tale.

Walls and Gates.

The oldest remains we have in the City are portions of the old wall by which it was encircled from very early times. The course taken by the wall is as follows :—Starting from the Tower, it went up to Aldgate and on to Bishopsgate, skirting Hounsditch, then to the churchyard of St. Giles', Cripplegate, where there is to be seen the remains of an old postern to Aldersgate. It then took a sudden turn until it came to Newgate, when it made its way straight down to the river, ending at what was afterwards Baynard's Castle, or near there. Baynard's Castle was known as the Castle of London, and the Governor was styled Constable of the Castle of London to distinguish him from the Constable of the Tower. It is possible that it went along by the river, but few, if any, remains have been found. Inserted in the south wall of St. Swithin's Church, Cannon Street, is a piece of the old London stone. From this point the Roman roads were measured.

In looking through the City records, there are several items of interest in connection with the old gates. The great gates were closed at the beginning of the curfew at St. Martin's-le-Grand (and the wickets were to be opened at the last stroke) and not opened that night unless ordered by the mayor or alderman. Edward II. ordered, after the bell had been rung at St. Thomas Acons, the wickets were to be opened (about six a.m.), and the great gates at sunrise. A guard was also kept at each gate, consisting of eight to twelve men, under the alderman of the ward. Tolls were levied on all carts having goods to be sold entering or leaving the City, except in the case of private individuals or goods for household use. The gate porters were not to allow lepers to enter the City. The gates and tourelles were let on lease to various persons. Geoffrey Chaucer held Aldgate in 1374. The Bishop of London always provided the hinges of Bishopsgate, taking as toll one stick from every load brought in. William Kingscote, keeper of Ludgate, was suspended for throwing stones from the top of the tower so that neither the sheriffs nor their officers could enter.

Monastic Buildings.

Amongst the buildings of Old London none were of more importance than the great monastic establishments. Sir W. Besant says:—"Within and without the City walls there stood fifteen great monasteries whose splendour only can be understood by the ruins of Tintern, Glastonbury, Fountains, and Rievaulx." Their reign came to an end at their suppression in the time of Henry VIII. and Edward VI. They may be arranged under the heads of monastic and conventual buildings, colleges, hospitals. The buildings which still possess some remains of an early period are as follows:—St. Bartholomew, Smithfield, the Charterhouse, the Temple, Austin Friars, St. Helen's, Bishopsgate; St. Mary Overie, the Greyfriars (now Christ Hospital, gateway, St. John's, Clerkenwell). Those destroyed consist of the following:—St. Martin's-le-Grand (now the Post Office); the Hospital of St. Mary of Bethlehem (now occupied by Liverpool Street Station); Priory and Hospital of St. Mary; The Preceptory of the Knights Templars, Holborn; The Minorites, or Nuns of St. Clare (now the Minories); Crutched Friars, St. Katharine's Hospital; site now occupied by St. Katharine Docks; the tombs and fittings moved to St. Catherine's Hospital, Regent's Park; The Abbey of St. Mary of Grace, or Eastminster, now the site of the Mint; The Priory of Holy Trinity, Aldgate; the two houses of the Black Friars, one formerly on the site of Old Square, Lincoln's Inn, the other at Blackfriars, now the "Times" office. The Monastery of the White Friars adjoins the Temple.

Colleges.

St. Nicholas Brotherhood, Camomile Street; St. Thomas of Acons, on the site of the Chapel of the Mercers' Company, the birthplace of Thomas à Becket; Whittington's College, Paternoster Royal; Jesus Commons, near Dowgate; St. James's Chapel-on-the-Wall, Cripplegate; Holme's College and Lancaster College, both attached to St. Paul's; Leadenhall College, in the Chapel of Leadenhall; Pountney College, St. Laurence Pountney; St. Michael College, St. Michael, Crooked Lane. The College of St. Mary Magdalene and All Saints, Guildhall.

Hospitals.

St. Bartholomew, Smithfield; St. Thomas, founded in Southwark, 1313, near to St. Mary Overies, purchased at the suppression by the City; St. Giles, Cripplegate; The Lazar House, Southwark; St. Anthony, Threadneedle Street.

St. Paul's Cathedral.

Old St. Paul's was surrounded by a wall which possessed six gates. They were the Littlegate, Cheapside, St. Augustine, Paul's Alley, Canon Alley and Paul's Chain, so called from the great chain which was drawn across. The road went along what is now Carter Lane, where stood the brewery and the bakery. It then went up Creed Lane, and so to Paternoster Row. The "Jesus Tower" was near to St. Augustine's Church, at the east end. St. Paul's was about 690ft. in length by 130ft. at its greatest width. It possessed the unusual feature of a north and south cloister. Remains of the latter, and also of the Chapter House, are to be seen on the south side. The Pardon Church-haugh, built by Gilbert à Becket, stood on the north, where also stood the Charnel House, which was taken down by the Lord Protector Somerset. At the west end there was a Galilee porch and the Church of St. Gabriel, and in the crypt, at the east end, a church dedicated to St. Faith.

Churches.

These may be grouped under two heads—those churches which were erected before the great fire, and those subsequently. Of the first division we have left—All Hallows, Barking; St. Andrew, Undershaft; St. Bartholomew, Smithfield; St. Ethelburga, Bishopsgate; St. Giles, Cripplegate; St. Helen's, Bishopsgate; St. Katherine, Cree; St. Olave, Hart Street. There were three others before the fire, and not destroyed then, but they have been pulled down in later times—All Hallows, Staining; St. James, Duke's Place, Aldgate; St. Martin, Outwiche. As regards the second division, they may be classified as those which were built by Sir Christopher Wren and those which have been erected by others.

In the Harley MSS. 4,941 British Museum will be found three schemes for the rebuilding of the destroyed churches. The original number proposed was thirty-nine, and the document, which authorises this number, is signed by the Primate, at the time "Gilb Cantuar." In all there were sixty-two rebuilt, namely, fifty under the supervision of Wren and the remainder by other architects. The loss by the Fire may be briefly stated:—Churches not rebuilt, thirty-five; rebuilt by Wren and others, sixty-two; total, ninety-seven. It is much to be regretted that so many of these monuments of the past have been destroyed, and that the destruction is going on. Only on December 6th of the present year were the fittings of St. Michael Bassishaw sold preparatory to the destruction of the church, and in the "City Press" of December 13th the possible destruction of St. Ethelburga, Bishopsgate, is mentioned.

Two churches have been re-erected. St. Mildred, Poultry, is now the private chapel at Thorpe Hall, South Lincolnshire, and St. Bartholomew-the-Exchange, it is said, is about to be removed from Moor Lane, Finsbury, and rebuilt elsewhere.

Cheapside.

In looking through the old chronicles, we find a different state of affairs to what is in vogue at the present day. For instance, we read that in Cheapside in the year 1273 seventeen candlemakers were expelled by the irate citizens. Bonfires of false goods took place occasionally. In 1311, at the request of the hatters, search was made for bad and cheating hats, with the result that forty grey hats and fifteen black hats were publicly burnt. In 1340 the furriers and fishmongers had a riot, and a fishmonger tried to cut off the Lord Mayor's head, and he was nearly hung for it. The pillory was also set up, and a fishmonger was put in there for selling bad fish, "And the said fish was burnt under his rascally nose." Opposite Wood Street stood Cheapside Cross, erected by Edward III. and pulled down by the Commonwealth in 1643. Bow Church, rebuilt after the Great Fire, has still in existence its Early Norman arched crypt from which it is said to take its name, "St. Maria in Arcubus."

The Royal Exchange.

The present is the third building which has been erected. The first was commenced in the year 1566 and opened by Queen Elizabeth in 1570. It was, however, a great nuisance. We find in 1590 certain women were prosecuted for selling oranges and amusing themselves and cursing and swearing at every one. Two years later, a tavern-keeper was fined for allowing tippling and for broiling herrings, sprats, and bacon to the vexation of the worshipful merchants. In 1622 complaint was made of the rat-catchers and dog-sellers, and bearwards would parade before the Exchange with a monkey on the bear's back. Gresham's Exchange was burnt in the Fire, and a new one was erected by Sir Christopher Wren. In the building of London it was Wren's idea to make it the central point of the City, from which broad avenues proceeded, but unfortunately it was never carried out. This Exchange was burnt down in 1838. The present one was opened in 1842. The Church of St. Peter, Benetfink, was pulled down when the present Exchange was built.

The Bank.

If one were asked what portion of the City has been most altered, the answer would probably be that by the Bank of England and the Mansion House, in the heart of the City. There is not a place more changed, or which has been more altered, than this. The Bank of England, for the most part, stands upon the site of the house of St. John Houblon, who sold his property to the Bank for a site. It consisted of a house with a frontage of about 80ft., running back about 250ft., and a garden. In front there were two small shops or stables. At that period Princes Street, as we now know it, had no existence, there being but a main court, 20ft. wide, which came out opposite to the church of St. Margaret's, Lothbury. Next to the Bank, as first built, there were two churches and a vast network of houses. Close to the Bank stood the site of the Hospital of St. Anthony.

This was a cell to the House of St. Anthony of Vienne. Pigs were given over to the hospital as alms. In 1311 we read that the Renter of the House of St. Anthony was sworn that henceforth he would claim no swine found wandering about the streets of the city as being alms, and that he would put no bells on them, or on those of any other person, nor would allow any such bells to be put on other than those which should be given. The saying at that time was "As fat as St. Anthony's pigs." Three swine killers were appointed to kill all pigs found in the streets: they could be redeemed at 4d. each. If not claimed, they were forfeited, and sold to repair the gates.

The Stocks Market.

Stow says: "In the year 1282 Henry Wallis, mayor, caused divers houses in the Citie to be builded towards the maintenance of London Bridge, namely, in one void place near unto the parish church, called Wool Church, where some time had stood a paire of stocks. The building took name of Moore Stocks, and was appointed by him to be a market place for fish and flesh in the midst of the City. In the year 1322 certain markets were appointed. The stocks were let to farm at £46 13s. yearly rental. In the year 1507 the rental was £56 19s., and in the year 1543, John Cates being mayor, there were eighteen stalls for fishmongers, rented yearly £4 13s. The butchers had also eighteen stalls, rental of £41 16s. 4d., and chambers above rented at £5 13s. 4d." The present Mansion House was erected on the site of the Stocks Market. Pennant tells us that "in the market stood a statue of Charles II., given by his most loyal subject, Sir Robert Viner, Lord Mayor, which his lordship discovered made at Leghorn. The statue represented John Sobieski trampling on a Turk. The Polish monarch was christened Charles, and the turbaned Turk Oliver Cromwell." Horace Walpole says it was unfinished, and a new head was added. The statue remained some time amongst the rubbish of the destroyed market and was given to Mr. Robert Vyner, a descendent of the Lord Mayor. On the demolition of the Stocks Market, it was decided by the City to arch over that portion of Farringdon ditch which lies between Fleet Street and Holborn. It was opened in 1737. Fleet Market lasted until 1829, when it was taken down to form Farringdon Street, and Farringdon Market took its place, being opened in the year 1826. The west side of the market was taken down when the Viaduct was constructed, about 1869.

The Guildhall.

The first Guildhall was built in the year 1411 by Thomas Knoles, then Mayor. In the first year of Henry IV. the executors of Sir Richard

Whittington gave £20 towards the paving, and in the next £20 more. In every window were placed the arms of Whittington. Sir John Shaa kept the first feast there about 1501.

The Guildhall Chapel.

This building was in existence until 1822. It was founded in 1299, with an establishment of warden, seven priests, three clerks, and four choristers. The chapel was given to the City by Edward IV. at the dissolution of the college. The following account of the chapel is taken from Stow:—"The chapel or colledge of our Lady Mary Magdalen and All Saints by the Guildhall, called London College; the same was built about the year 1299, and that Peter Fanelove, Adam Francis, and Henry Frowyck, Citizens, gave one Messuage with Appurtenances In the Parish of St. Foster to William Brampton, custos of the Chantry by them founded in the said Chappell, and . . . the other house in the parish of St. Giles, Cripplegate, in the 27th of Edward III., was given to them. Richard II. granted license to Stephen Spilman to give one messuage, three shops with the appurtenances in the parish of St. Andrew, Holborn. King Henry VI., in the 8th of his reign, gave license to the Custos to build of new the said Chappell or Colledge of Guildhall, and in the 27th year of his reign granted to the parish clerks in London a Guild of St. Nicholas for two chaplaincies.

"The value of the Colledge was £12 8s. 9d. The library, which was situated on the south side, was built by the executors of Sir Richard Whittington and William Bury. The arms of the former were on one side, and the initials WB on the other. The books which belonged to the library were plundered by the Protector Somerset."

THE STRAND, DRAWN BY HANSLIP FLETCHER.

Blackwell Hall.

Next to Guildhall Chapel stood Blackwell, Bakewell, or Bassinghall. In 1396-7 Richard II., in consideration of the sum of £50, granted licence to John Froxle, William Parker and Stephen Spilman, citizens and mercers, that they might assign unto the mayor and commonality for ever for the common benefit the said messuage, called Bakewell Hall, &c. From this period it became established as a weekly market-place for woollen cloths, both broad and narrow, which were brought from all parts of the kingdom to be sold. An ordinance was passed in 1397-8 under the mayoralty of Richard Whittington, and another in the year following, under the mayoralty of Drew Barringtine, declaring that no foreigner or stranger should sell any woollen cloth but in the Bakewell Hall, upon the penalty of the forfeiture thereof. This was confirmed again in 1517. No manner of person being freeman of the City should suffer any person whatever, be he free or foreign, to buy or sell any manner of woollen cloth harboured or lodged contrary to the said ordinance, or any other manner of cloth made of wool within his shop unless the said cloth was first brought to Blackwell Hall. Having stood for about 400 years, it became ruinous about the middle of the sixteenth century; and it was pulled down and a new building erected in the year 1558, at a cost of £2,000.

Blackwell Hall appears to have been erected about 1672. The attic was ornamented with cornice and pediment, a stone gateway being in the centre, the Royal Arms being over, and the City Arms impaling Christ's Hospital on the head of the arch. This structure was taken down in 1819.

DISCUSSION.

Mr. A. W. Hennings said he especially appreciated Mr. Oliver's address when he remembered how very difficult it was to collect information about old London. There was such a wealth of material if it were only looked for. Ely Place might be taken as an example, for there many things of interest had been discovered in connection with the foundations, including an old footbridge, which had simply been covered over, no care whatever being taken to preserve it; such a relic ought to have been placed in a museum. He remembered also that about twenty years ago an old crypt was discovered below a Norman arch at Cripplegate, but just because some little delay would have been caused if measures had been taken to preserve it the place was demolished. An old arch had been knocked down in Cornhill, and the same thing had occurred in Queen Victoria Street, where the ancient monastery of Blackfriars formerly stood. Ground rents were, indeed, high, but every effort should be made to prevent reckless demolition. He would recommend those who had a desire for the study of old work to devote some attention to the study of old London.

In Mr. F. G. F. Hooper's opinion the more the old was studied the more interesting the London of the present day became, for, by pursuing this course, one learned what was the origin and meaning of familiar names and understood the relative positions of the old and the new buildings of the city.

Two books which those interested in the subject might read with advantage, said Mr. C. H. Brodie, were "London City Churches" and "London Riverside Churches." In considering the facts, Mr. C. J. Williams had come to the conclusion that London three hundred years ago was a very much more beautiful place than it was to-day. There was, for example, the style of architecture of Cornhill in the time of Henry the Eighth or the old Cathedral of St. Paul, or the splendid width of Cheapside compared with the present width. We had, of course, vastly improved in sanitary matters, but still he half wished he was living in the old city.

Mr. M. Garbutt entirely disagreed with the adverse comment on the beauties of London at the present time; as regards picturesqueness, the balance was largely in our favour. He referred to the softness of outline which the haze gave, and said that we possessed a city that would furnish us with as much in the matter of picturesqueness as any other city in the world. The details of many of our buildings would not stand criticism, but the beautiful effects which the fog produced could not be overestimated. Citing Cheapside as a wide street was citing an exception, for the majority of the streets in old London were narrow, and he thought that wide streets were a great deal more dignified than narrow ones. With all the fog, London was a better city to-day than it was three hundred years ago. Mr. M. J. Dawson also referred to the beauty of the old city with all its mediæval architecture. The President said they were especially in need of a map like that shown them that evening, one which had all the old parts and buildings distinctly marked out and defined. If any excuse were wanted for the reading of such a paper as they had heard it was that some of the ancient buildings of London were constantly disappearing, and they had seen how small valuable bits of architecture were simply from wantonness destroyed. One lesson we might learn was that if work came into our hands the temptation, which might be great, to destroy it should be combatted and the relic preserved. He could not help feeling that the ground we trod was sacred; the pavement was made up of churches, and it was remarkable to think of the number of these edifices which had been erected in the old days to the glory of God, and to think of the money that had been spent on them. He also felt that in London was written the history of the land, not perhaps in architecture, but still in relation to practically all else, and although the old builders had not the regulations and restrictions (whether good or bad) which were imposed at the present time, the city was more artistic. He referred to the difficulty experienced now to enter into the truly artistic spirit, but quite agreed that we were much better off in the matter of sanitation. He also thought that fog lent charm to the view. Ugly buildings might look pleasing in a misty atmosphere, and even the Tower Bridge might appear pleasing in a fog. He deplored that a site so fine as the Victoria Embankment had been marred by the erection of such a building as the Savoy Hotel, and it seemed a disgrace that such a thing should ever have been allowed. Foreigners were always remarking on the charming effects produced by our misty atmosphere. As regards what the Institute were doing in relation to old London, he said that some time ago a list of buildings had been compiled for the use of members, particularly of provincial members. It was now being essayed to remodel that list, and he thought they should ask Mr. Andrew Oliver to join the sub-committee. They hoped eventually to draw up a kind of pamphlet containing all that was interesting in both the old and the new buildings.

In replying to the vote of thanks that had been proposed and seconded, Mr. Oliver said that the old buildings were disappearing one by one, and it was like the story of the doctor who was to receive a guinea for each of his visits to a patient. In the end, when he was to be paid, he said "Well, singly they're contemptible, but altogether they're irresistible." But he was afraid that as long as it was a matter of sentiment versus rent the victory would lie with the rent.

Arranged on frames around the room was an imposing collection of plans and engravings of buildings and streets in the London of yore.

ARCHITECTURE AND NATIONAL CHARACTER.

At the outset of his lecture on the reflex of the national character in the architecture of the period, delivered on Monday in last week at the London Institution, Mr. Francis Bond pointed out how the fine arts—or what one might call the useless arts—differed from architecture in that while the former did not evolve during the barbaric or uncivilised age, the latter knew no such bounds, and truly reflected the spirit and character of those who formed it. Starting with the Greeks, about 700 years before the birth of Christ, it might be said that their buildings reached, not relative, but absolute perfection, the two most remarkable features about them being their beautiful proportion and the subtlety of the curves employed. Then there were all those corrections in the architecture of the faults of the eye; for instance, the architraves were not perfectly straight (though to the eye they appeared so), but curved upwards or arched slightly, this being done to correct that optical defect which causes a long straight line to appear sagged a little in the middle. Further, the vertical lines of a Greek building were not actually and truly so; they only appeared vertical. All this showed what wonderful care and thought had been expended on every part of the building, even down to the smallest details, while the accuracy of the masonry was astounding. Yet the work had been done entirely by slaves, of whom we had no record whatever, for, unlike the Egyptians, the Greeks did not include any representations on the stones of their buildings of the lives of those who had been engaged in erecting them. But was there nothing in Greek architecture which showed some lack of perception? There was—the utilisation, for example, of a given area. In the Parthenon, after deducting the space taken up by the outer and inner columns, it was found that more than half the nominal area was wasted, and the accommodation in a Greek building as compared with one of the Byzantine style was small. Then the roofs were made of wood, and there was the much disputed question as to how the Greek temples were lighted, seeing that they had practically no windows. Greek architecture reflected the keen artistic temperament, the cultured taste, and the refinement of the nation; but it also reflected the weaknesses.

Coming to the Roman period, we saw a great change. The Romans, unlike the Greeks, built for all time and the characteristic features of their buildings were dignity, unparalleled solidity and utility; they learnt their art on the battlefield and on the march. Byzantine architecture, which followed, was in reality Roman, though its details were Hellenic, and in it we saw the development of the dome, so splendidly presented at the church of Santa Sophia, at Constantinople, which city was then at its zenith and the centre of attraction for European culture and civilisation. St. Mark's, Venice, was the living embodiment of the eleventh century in the East. Byzantine architecture had received much harsh criticism, but it had great beauties, and it was owing to the Byzantine spirit that the hordes of Europe were kept in check.

With the collapse of the great Roman empire, building practically ceased and remained in this state for a long period; then, after the Romanesque style, came, in the eleventh and twelfth centuries, what was perhaps the greatest time for architecture in the world's history—the Gothic. Throughout the length and breadth of Europe buildings sprang up in the new style, and in England, with the development of the monastic spirit, there arose the abbeys and the cathedrals of the various orders. For nearly two and a half centuries after the Norman Conquest our buildings were in the main French, and even as late as 1245, during the reign of Henry III., French influence was very strong in the country. Until the middle of the thirteenth century English architecture was much indebted to France, but then the break occurred, when the language was changed and the English nation really began to run its own course. To christianise the world was the Gothic aim, while the Renaissance's ideal was a return to pagan times. The architecture of the Renaissance reflected the spirit of its age more than any other, but the centuries that followed it, the seventeenth and eighteenth, were dull and unenlightened; the eighteenth was the age of pews.

Then coming to the present age, Mr. Bond asked, what could be said of its architecture? In reality, we had no architecture of our own, no national style, and the buildings of the time reflected the character of all ages except their own. Modern architects knew too much. What could be thought for instance of the London clubs? They did not reflect the spirit of the nineteenth century; some were really sixteenth century buildings at Florence or Rome. The Houses of Parliament symbolised the age of Queen Elizabeth, but were strangers to that of Queen Victoria. Mr. Jackson lived in the time of James the First; and so the catalogue might be extended. Did the suburbs of Brixton and Clapham reflect the national character in the design of their buildings? The inevitable conclusion in regard to our own time was that the spirit and character of the age was not reflected in the works of the architect at all, but in those of the engineer. He was the mirror of the nineteenth century.

"Graphic Calculations" was the subject of a recent lecture delivered by Mr. D. Bennett Dobson before a meeting of the Glasgow and West of Scotland Technical College Architectural Craftsmen's Society. It was divided into eight sections: reactions, moment of resistance, shearing stress, graphic arithmetic, wood beams, cast-iron beams, rolled-iron beams, and steel beams.

Crystal Palace Band Stand Competition.—Although no design received has realised the object which the directors had in view when initiating this competition, they have, nevertheless, acting on the advice of the president and their assessor, decided to award the premiums offered. It is not likely that any of the designs received will be executed. The premiums have been awarded as follows: First premium (thirty guineas), Messrs. Walter McFarlane and Co., Glasgow; second premium (fifteen guineas), Mr. Henry C. Eyres, Millfield Cottage, Millfield Lane, Highgate; third premium (seven guineas), Mr. G. M. Ellwood, 55, Alexandra Road, Upper Holloway.

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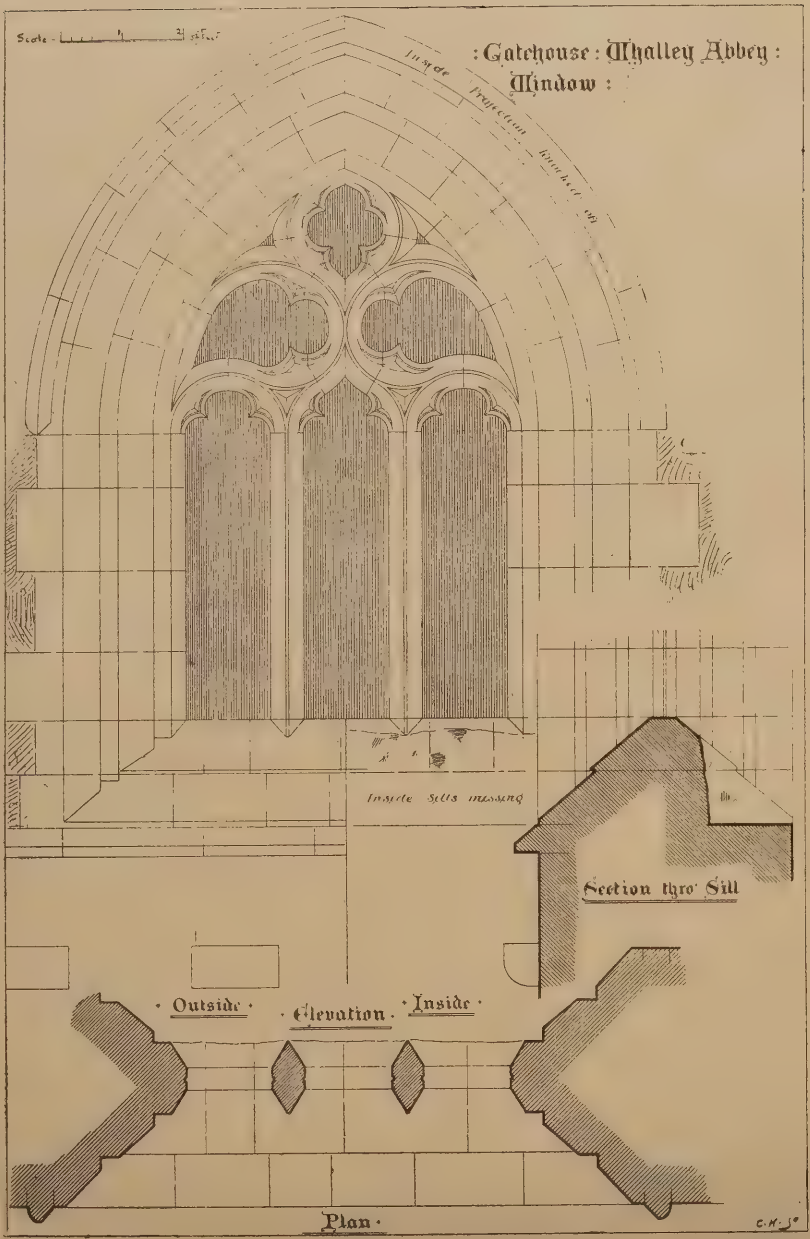

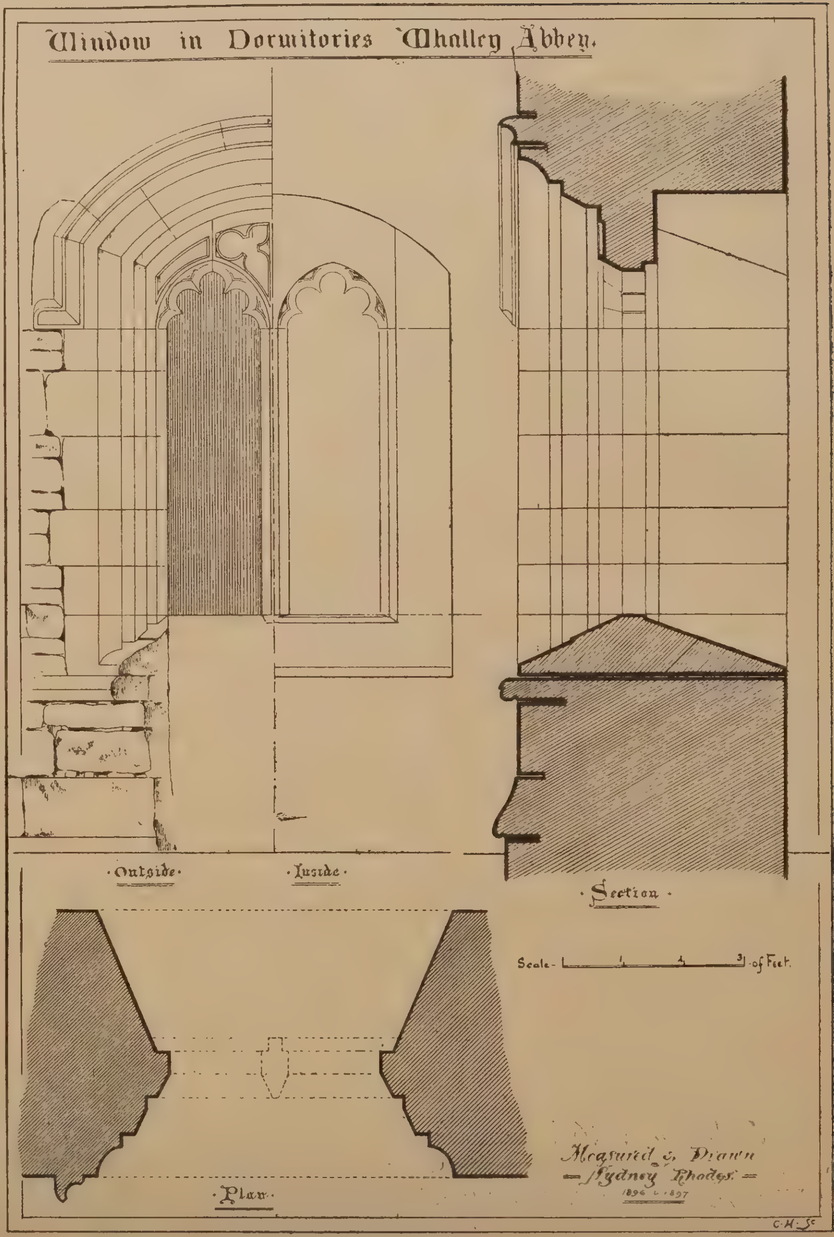

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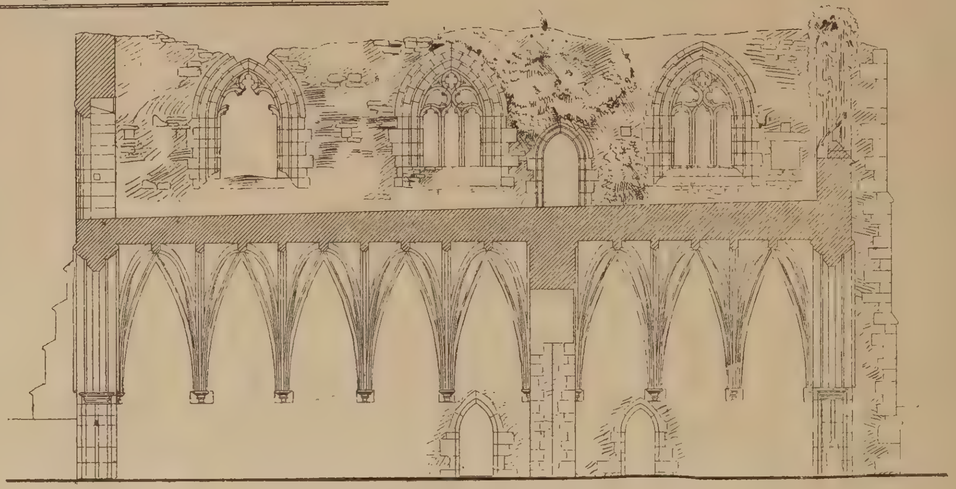
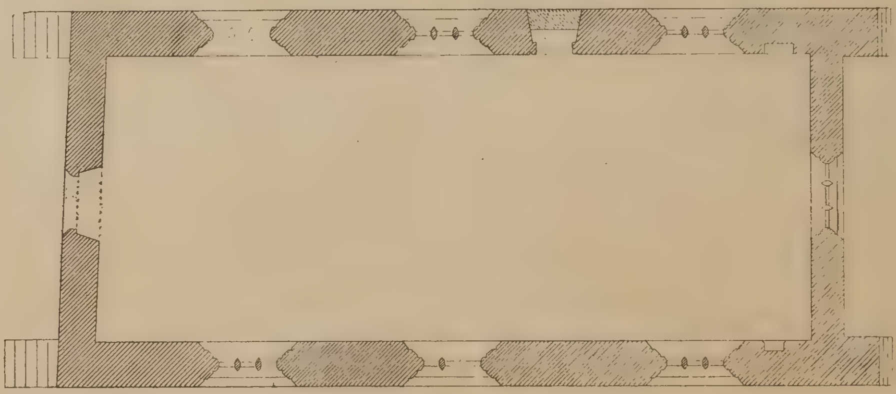
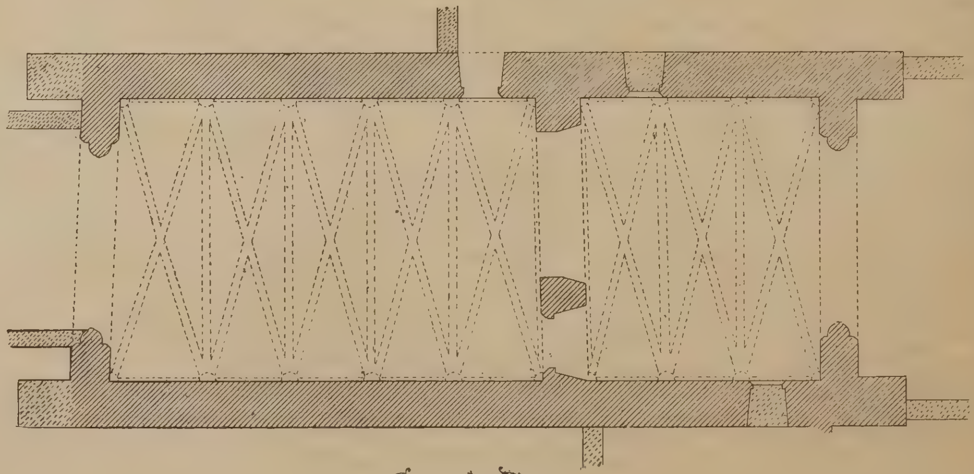
Gatehouse Whalley Abbey



Longitudinal Section



Upper Floor Plan

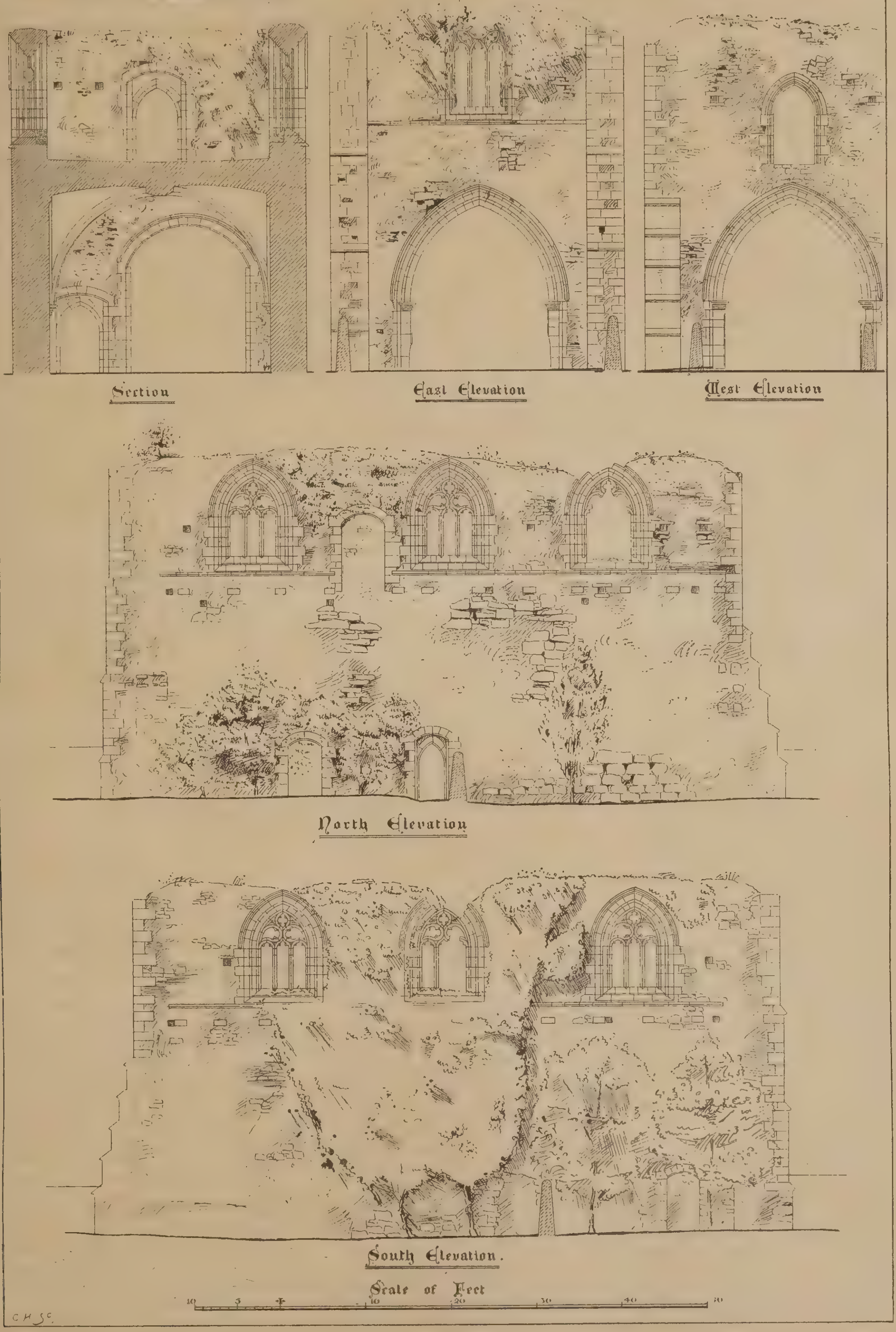


Ground Plan

Scale of Feet

GATEHOUSE, WHALLEY ABBEY

Gatehouse, Whalley Abbey



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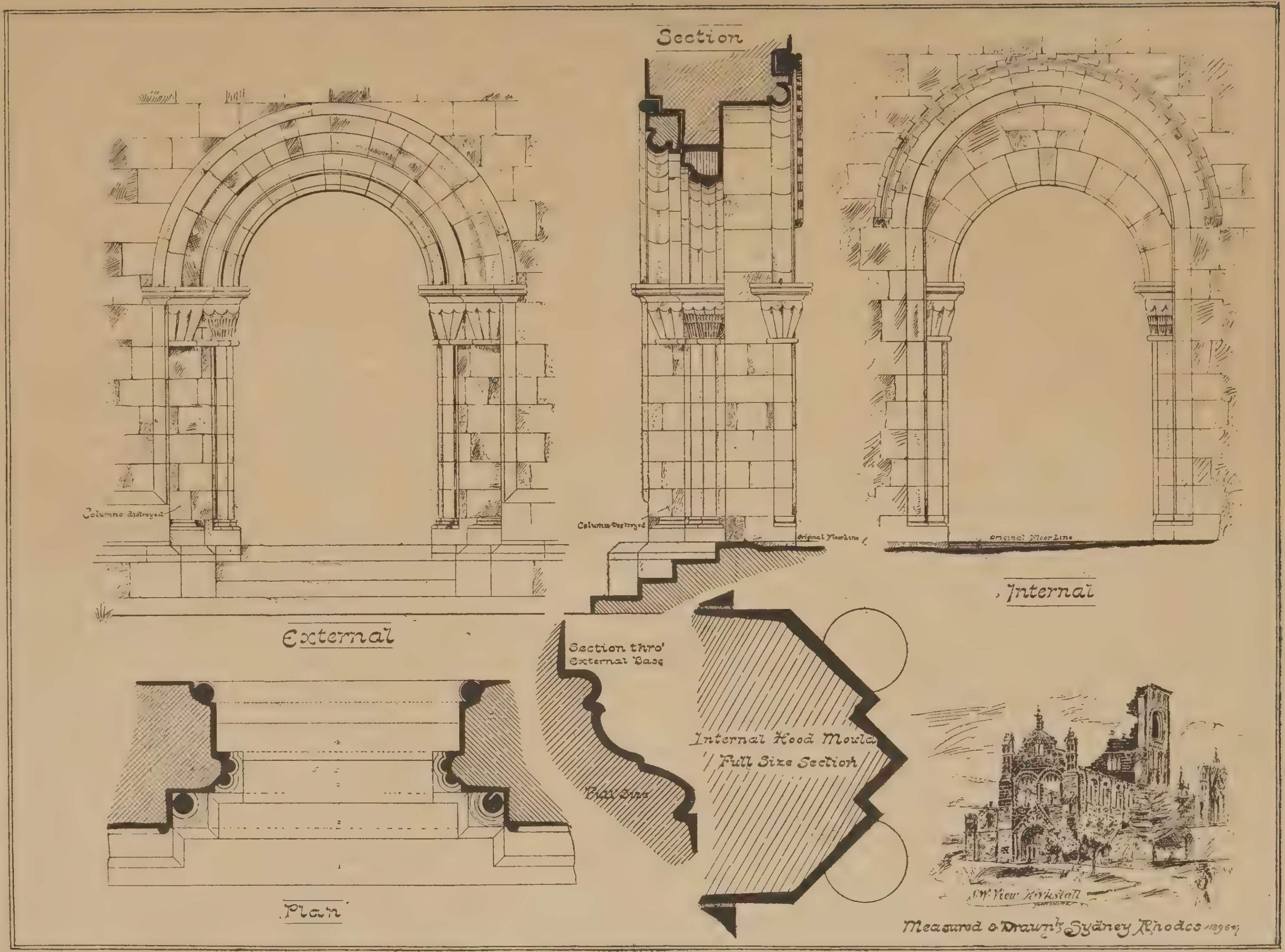

WEST DOORWAY, KIRKSTALL ABBEY. Measured and Drawn by Sydney Rhodes.

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R.I.B.A.

THE ARCHITECT IN RELATION TO FIRE PREVENTION.

A MEETING of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, when the president, Mr. William Emerson, occupied the chair. Mr. Alexander Graham regretted to announce the decease of Mr. Stephen William Williams, F.S.A., F.S.I., of Rhyader, Radnorshire, who was elected a Fellow in 1886. Some nominations were read by the secretary, and Mr. Thomas Blashill, F.R.I.B.A., late superintending architect to the London County Council, then read his paper on "The Architect in Relation to Fire Prevention," of which the following is a summary:—

Fire-resisting construction has been made prominent by the Institute from time to time, but it is difficult to keep pace with increasing needs. Buildings are more lofty, and more crowded, and more closely packed with inflammable goods. Old residential buildings are turned into warehouses, the construction being actually altered for the worse. The Cripplegate fire was a case in point. Were it not for an efficient Fire Brigade, we should recognise that fire risks are increasing in spite of Building Acts. There is no law to prevent this or to require efficient protection of persons and property, and the architect must in many ways go beyond legal requirements. It is he who knows the risks and the proper remedies, and he cannot escape responsibility. The public is absolutely reckless of danger until some fatality occurs; then it looks out for a scapegoat. Four provincial theatres were burned during the last month. Fortunately no one was in the buildings at the time of the outbreak, for, in one case at least, the building was stuffed with scenery in a way one would not think to be now possible. In London within the past week lives have been lost by an ordinary shop fire. Means of prevention must be sought. Fire-resisting materials are getting much more available, and they only should be used. They should be applied scientifically, so as to minimise danger. We are much behind foreign countries in our regulations for public and private buildings as regards fire prevention. It is a hundred times more important to the present generation that old buildings should be fire-resisting than that new buildings should be so built. The power to compel this is very limited. The architect should get it done voluntarily. Fire and panic in places of worship are rare; therefore provisions for safety have not been very much considered. The greatest catastrophes from fire, however, have occurred in churches, and there are plenty of narrow escapes even now.

There are about ten fires in the Metropolis every day—not a large average considering the number of buildings. Fire insurance discourages foresight and precaution. Hence comes risk and loss of life—the latter too frequent, though happily not to any great extent at one time. The public appear absolutely indifferent, and laugh at precautions whether in places of assembly, workshops, or houses. This is not the view to be taken by the architect. He should be a diligent student in such matters, if not an expert. He should try to work with the municipal authorities, and not thwart them, or be content with fulfilling the bare letter of the law.

All laws which affect one's temporary interests seem harsh. Parliament will never pass building laws which go as far as students or experts think to be necessary, nor even so far as the skilled and prudent architect may consider it advisable to carry out in his work. In all our recent dealings with places of public amusement and factories an enormous amount of improvement has been effected by the public voluntarily. When such is the case the law can be strengthened so as gradually to bring unwilling persons into line.

The architect can do much more than he may expect to persuade and convince his client that good building is cheap building in the end. The rebuilding of the Cripplegate area is a striking instance of what may be done in individual cases by the action of the architects. We may hope to raise the general standard of practice to such a level as the Institute feels to be necessary.

DISCUSSION.

A communication was read by the secretary from Mr. Arthur Cates, in which he specially pointed out the necessity for making the roofs of buildings fireproof, a feature which was, unfortunately, considered by many architects as needless. The Building Act provided that the roof should be covered with slate or other incombustible material, but this was only the minimum, and it ought to be the architect's duty to see that catastrophes were not caused through insufficient protection in this part of the structure. He mentioned how timberwork might prove a great deal more fire-resisting than steelwork, and expressed the hope that those who had charge of our great national art treasures would put the roofs in a reasonable condition of safety from fire. With regard to the provision of water fittings in theatres and similar buildings, he pointed out that these ought not to be kept, as they so often were, rolled up in a glass-fronted case, but should be connected up ready for immediate service. He also mentioned what a danger there was with shop fronts composed of great sheets of plate glass, insufficiently supplemented by proper supports for the floors above.

The chairman of the Building Act Committee of the London County Council, Mr. D. Waterlow, said that what they, on the committee, had purely to deal with was the saving of human life; they could not consider a question of cost. As regards theatres, it was panic and not fire that was important to them, and it was the smoke which was in almost all cases the cause of disaster. The work of the Council had been greatly criticised in connection with factories, especially because of the number of serious fires that had occurred in these buildings. They had, however, done their best. He mentioned that in London there were a number of factories quite unsafe, simply having a single staircase for escape, and, of course, with only a little fire, this would become choked with the smoke. To get over that deficiency they would require that there should be one really fireproof staircase, for in factories where there were often a great many women the danger of panic was immense. The Council were unable to use their power unless there were more than forty persons employed on the ground floor, and he mentioned how in a factory where only eight persons were engaged one failed to escape when a fire occurred. It was therefore of the utmost importance to provide against the staircase becoming filled with smoke, and for this reason special attention was required to everything at the bottom of the staircase. In the matter of means of escape from high buildings, the Council could only deal with new buildings, and he would ask all present to remember this aspect of the question in connection with repairs to old buildings and to do all that lay in their power to render them as safe as possible.

Sir John Taylor, the next speaker, said that the earliest example he knew of fireproofing was at the National Gallery, where fire pots were first used in the floor construction. The provision required by Mr. Blashill that all flooring should be nailed close down on the concrete, and the ceilings treated similarly, had a disadvantage, for it then made it difficult to deal satisfactorily with the wires and gas pipes in a house, which were thus exposed. With regard to the Record Office and the new Admiralty building, he mentioned that both had roofs of absolutely fireproof construction, the former having a roof built and covered with iron, protected by a fireproof ceiling below. He said that he would do his utmost to see that in connection with new public buildings, Governmental and otherwise, the best fireproofing methods were employed; but the cost was always a great consideration.

Mr. W. E. Reilly proceeded to mention a few points worthy of notice in the by-laws relating to fireproof construction in the Greater New York Building Code, which came into force on Tuesday, December 12th. This code had been in preparation for some two or three years, and was most complete. There was a rule in it as to the height of public buildings (the words "public buildings" were used in a wider sense there, including restaurants and lodging houses), limiting the height of a building built without fireproof construction to 35ft., without any limit as regarded area; every building which was over 75ft. in height had to be constructed entirely of fireproof material. In regard to theatres, it was required that there should be one main street in front and two side streets on its adjacent sides. The passages had to be 7ft. in width on each flank when the building gave accommodation for 1,000 persons, and 10ft. when for 1,800 persons. A much more efficient means of escape than by staircases had been adopted, by leading the exits on to fireproof slopes, confined to a rise of 1 in 12. There was also a regulation which was a great improvement on the system in London—a place of amusement was never permitted to be in connection with any other inhabited building, such as hotels, and factories. This would, of course, in London do away with the present music halls. He added that it was of great importance to provide quick exit, as nearly always it was found that persons killed in fires had not been burnt but asphyxiated.

Mr. Edwin O. Sachs, in proposing a vote of thanks to Mr. Blashill for his paper, called attention to two important points in the paper: first, that architects were always too prone to think that fire-prevention had been arrived at when the Building Act by-laws had been attended to—they should understand these were a minimum; and, secondly, with regard to the application of fire-preventive materials to old buildings. Mr. Sachs' opinion was that in nine cases out of ten the client would not think or talk of fire-prevention; he would, however, consider the drainage, and it would take an equal time to that expended in bringing him to regard drainage as important, to make him aware of the danger to human life by fire. He, the speaker, personally preached exit before construction; if they could only get people to construct proper exits the duty and responsibility of the public authority was ended. The factories, he was happy to say, were not being built in London, but were going to the suburbs for various reasons, and the more manufacturers could be encouraged to do this the better. The hotel question was one of the most important in the prevention of fire, and he thought it was high time that something should be done to protect people in buildings where they congregated by night, as much as where they congregated by day. He was of the opinion, after due consideration, that at the present moment nine out of every ten hotels in London were death-traps.

Mr. H. H. Statham made a few remarks in regard to theatres. He had noticed that the audience usually endeavoured to get out through the door they came in by, and as often as not this was crammed in one corner, so that in case of fire there would be a stampede to this exit, and a blocking would ensue. This could have been avoided by symmetrical planning of the site, giving an equal exit at each side.

Mr. C. Forster Hayward pointed out how extremely careless workmen often were when repairing buildings, and thought that staircases ought always to be supported on the outer as well as on the inner side.

The president, after referring to the moral responsibility of the architect in not only complying with the regulations but in doing what he knew was needed, agreed that the matter of exits was more important than that of fireproofing, and said it would be a good practice if a plan were hung up in every room of a hotel to facilitate the escape of the occupants.

Mr. Blashill briefly replied to the vote of thanks which had been proposed, and the meeting then terminated.

For the Admiralty Harbour Works at Dover, Messrs. Pearson successfully laid the first block last Friday. It weighed forty tons.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"A Gothic cathedral strikes one like the enthusiasm of poetry; St. Paul's, like the good sense of prose."—WALPOLE.

Quotations Wanted. THERE must be many of our readers who, in the course of their wanderings in the highways and by-ways of literature, have from time to time lighted upon some quotable passage, containing a fine thought finely expressed, and bearing very closely upon the interests represented by this journal. We invite any such to send us the passages which have most impressed them, so that their fellow readers may share the pleasure and inspiration they have themselves received. By thus enlisting the services of our readers we hope to obtain for publication at the head of this column a number of aphorisms or notable sayings which would otherwise have escaped our notice. Quotations may be either in prose or verse, but it should be remembered that their value for our purpose depends chiefly upon their brevity and their appositeness. We do not offer a prize for these quotations, thinking that our readers will find pleasure in pointing out to others some of their own favourite passages, but we shall be pleased to send the current issue of the ARCHITECTURAL REVIEW, as an acknowledgment of the courtesy, to everyone who sends a quotation we consider suitable for our purpose.

Kirkstall Abbey. SITUATED in a beautiful vale watered by the river Aire, stand the picturesque remains of Kirkstall Abbey, one of the two abbeys which we illustrate in our inset sheets this week. It is situated about two miles and a half west of Leeds and is undoubtedly a fragment of the monastic splendour of the twelfth century. The abbey is of the Cistercian order and was founded by Henry de Lacy in 1157. Parts of it are now in a very dilapidated condition, but alterations have recently been made, especially to the tower, which was much in need of support. The tower was built in the time of Henry the Eighth, and remained whole until January 27th, 1779, when three sides of it were blown down, leaving only the south side standing, part of an arched chamber leading to the cemetery and part of a dormitory. The site of the monastery was granted in exchange by Henry the Eighth and Edward the Sixth to Archbishop Cranmer and his heirs, but soon afterwards it passed out of the family. The abbey now belongs to the Leeds Corporation, having been presented to them by the late Colonel North. The sketch at the right-hand corner of the plate was taken from the south-west side, and shows the abbey as it looked before the recent alterations were made; it also shows the position of the measured doorway, which is a good example of the Norman style of architecture. The columns are missing in many cases, and the mouldings and stonework are now decaying, owing probably to the chemical action of the air of Leeds and the manufacturing neighbourhood.

Whalley Abbey. THE parish of Whalley, situated about four or five miles north-west of Burnley, in Lancashire, is one of the most extensive in England. It is chiefly in the Blackburn hundred, the parish itself extending eastward to the West Riding of Yorkshire. Whalley Abbey (parts of which are still in good restoration, as shown on our inset plates), was built in the year 1296 for the white or Cistercian monks of Scanlan, by Henry de Lacy, Earl of Lincoln. The abbey flourished until the Dissolution. Afterwards, the monks, encouraged by Aske's rebellion, resumed possession of the building, for which act the abbot of Whalley was executed. In the ruins of Whalley Abbey there still remain some very good examples of tracery windows in the Decorated style of English architecture; also two stately gateways and a building conjectured to have been the abbot's private oratory or chapel. There are also some good specimens of the Perpendicular style. Three plain stalls, together with some excellent wood screenwork, now decorating the Early English parish church of Whalley, were originally situated in the abbey. The illustrations of both Kirkstall Abbey and Whalley Abbey are from measured drawings by Mr. Sidney H. Rhodes, Regent's Park, N.W.

An Expensive Refurbishing. £90,000 is the sum which the French Minister of Fine Arts intends to ask the Chamber for, this being the estimated cost of sweeping and garnishing the national palaces and the residences of the various ministers in view of the exhibition. About £26,000 will have to be expended on the Elysée Palace alone to make it presentable. The minister draws rather a piteous picture of the present condition of M. Loubet's residence. Much of the furniture badly requires renewing, the chairs need to be recovered and restuffed, and the curtains and hangings are faded or altogether worn out. This item will run away with £15,000. Nearly £4,000 will be wanted to make the table service worthy of the President and his guests. The service at present in use dates from 1879, and, as the result of much breakage, is quite insufficient even for ordinary requirements. Sturdy democrats should be mollified at learning that M. Loubet is often short of plates and without a proper complement of soup tureens. His stock of wineglasses, too, is wholly inadequate, and will have to be replenished if the visitors to the Elysée in 1900 are not to be condemned to a compulsory use of the loving cup. Most of the ministers have similar complaints to make as to the way in which they are lodged, and are to receive grants of varying importance to put their establishments on a proper footing. There will therefore be a wholesale scrubbing and rubbing and making bright, in order that the august personages may be respectably housed.

A Survey of the Soudan. AFTER the fierce arts of war come the gentle arts of peace, so that while, not so very long ago, we were eagerly reading accounts of great military movements in the region of Khartoum, and of the advances of innumerable hordes of armed savages, it is now announced that an archæological survey of the Soudan is to be immediately undertaken. In fact, the first step in this direction has been made by the Egyptian Government appointing Mr. Howard as inspector of antiquities for Upper Egypt and the Soudan. Mr. Howard has been identified with the Egyptian Exploration Fund; besides, the appointment of an Englishman will be specially welcomed in this country by Egyptologists and all interested in antiquities of the land of the Pharaohs, as hitherto posts of this character have invariably been given to Frenchmen. Mr. Carter is at present engaged at Thebes in completing his work at the temple for the Egypt Exploration Fund, but it is understood that this will be his last season there, and early in the New Year he will enter upon his new duties. It is hardly necessary to add that a proper survey of the land connected with the first great civilisation is likely to be highly interesting and profitable.

An Old Churchyard Cross. THE base of the old churchyard cross at Mytton All Hallows, Yorkshire, has recently been discovered, and has been placed for the present in the Sherburne Chapel. The head of the cross is in a fair state of preservation, and has been restored as a memorial of the Queen's Jubilee. It has been thought by some antiquarian experts that Mytton Cross was as old as the time of Paulinus, but the recent discovery of the base enables the date to be assigned to a much later period, the general character being Early English or possibly Norman. The base is a large square block of stone, splayed in its upper portion and terminating in a hexagonal support, into which the shaft of the cross was inserted. The head of the cross is of the familiar early type, with a crucifix in low relief on a sunk panel, bordered with a looped cord, having fleurs-de-lis at the corners on one face, while the other shows the rood with attendant figures, also in a sunk panel, with rough tabernacle work. The missing finials, formerly belonging to the tower at Mytton Church, have been identified on the gables of an old Tudor building in the village.

Old English Inns. WHEN he had briefly sketched the rise and development of the English inn from the old Roman days to the climax of its fame in the early Victorian Era, Mr. W. Fitzwater Wray (in the course of a recent lecture at Bradford) commented on the decay of the inn consequent upon the introduction of railways, which, he said, had changed it generally either into a big hotel, where the visitor was one of a number, and Boniface was a young lady clerk in a glass house, or to a loathsome plague-spot, where the landlord's only concern was to get the maximum of liquor down his customer's throats before 11p.m.—The lecturer then took the audience with him on an imaginary tour round England, even into the corners of Cornwall, Dorset, Kent, and Essex, in quest of the old inn. In a chatty, bright and humorous manner, he associated the old inns visited with brilliant word-pictures of the stirring times of the Wars of the Roses and the great Civil War. Those inns around which the glamour of the genius of great novelists, poets and historians has been thrown were realistically described, a special feature being made of the inns associated with the works of Charles Dickens. Mr. Wray also referred at length to the holy inns of Glastonbury and Alfriston, and the pilgrimages with which they were connected.

Memorial to Charles the First. THAT much-abused and much-belauded monarch Charles the First was executed two hundred and fifty years ago, and it is now proposed that he should have a memorial. At Carisbrooke, where Charles spent many months of captivity, and where his young daughter Elizabeth pined and died with her cheek upon her open Bible, it is proposed to restore the ruined church in which both worshipped. The castle being Royal property, permission has been refused unless the work can be thoroughly, though not expensively, done; and for this £1,000 is required, of which only £200 has been collected. This parish church is much needed for the outlying inhabitants, who are far from any church, and both the Princess Henry of Battenberg, as Governor of the Island, and the vicar of the ruined church, are anxious that the work shall be carried out. Miss Charlotte M. Young, who is the zealous advocate of the proposal, says that when Cromwell, who defied and overthrew the Government, has actually been commemorated by a statue outside the Houses of Parliament, surely the devoted King ought to have his memorial, not in a personal image, but in the restoration of the fallen temple of his Lord.

Discoveries at Rochester Castle. THE repair of the fore-building of the ancient Keep of Rochester Castle, which has been carried out under the supervision of Mr. George Payne, secretary to the Kent Archæological Society, is now completed. The battlements were found to be in a very ruinous state, while the eastern wall of the chapel, the remains of the roof of the chancel, and the chancel arch were also in great need of restoration. The original Norman masonry has been disturbed as little as possible. During the repairs to the roof-line of the nave, a fine Norman two-light window was discovered blocked up in the south wall (the north wall of the Keep), and this has been opened by the removal of the plastering. Another interesting discovery was made in the State dungeon, an air-shaft communicating with the lower dungeon being found and opened. As is well known, the Keep of Rochester Castle is one of the finest castellated ruins in the kingdom.

A Maker of Modern Paris. A MONUMENT to Alphand, to whom Paris owes its present aspect almost as much as to that other great innovator, Baron Haussmann, though the latter was undoubtedly the pioneer, while Alphand continued his improvements and completed them with ideas of his own, has been unveiled in the Avenue du Bois de Boulogne, Paris. Alphand's specialty was trees and public gardens. It was he who converted the Parc Monceau from a dreary stretch of waste ground into the present miniature, but dainty, park, and it was he who endowed the east end of Paris with the Buttes Chaumont, the most picturesque, perhaps, of the public gardens of the capital. Alphand, too, organised the magnificent greenhouses and nursery gardens now in the possession of the city of Paris. It was from this source that were drawn the horticultural embellishments that were a feature of the Exhibition of 1889, and the institution will furnish still finer results next year. M. Dalou, the sculptor, has disregarded all the traditions of classic art, and has depicted Alphand, in a short jacket, and wearing his famous soft felt hat, chatting familiarly with Bouvard and Huet, two of his chief assistants. The group is conceived in a purely realistic spirit, and is a striking departure from the rather stilted rules still honoured among almost all the sculptors entrusted with the execution of public monuments.

The City of Mexico. THE Federal District of Mexico comprises an area of 424 square miles, and is divided into the municipality of the City of Mexico and the smaller suburban municipalities (prefecturas) of Tlalpam, Tacubaya, Xochimilco, and Guadalupe. In the last report from our consul there it is stated that the development in building still continues with great activity. This period of improvement began about ten years ago, and has continued increasing steadily. The houses in the city were mostly of the old Spanish type—a large yard with the rooms around it. Modern requirements are such that many of these old edifices have been demolished, and those of modern style have been erected. The City of Mexico, which was once called the "City of Palaces," might well retain a sort of relative claim to that title, but only in so far as concerns the buildings occupied by the better families. Like all large cities, it is extending to the west, and what was once the aristocratic and fashionable quarter is almost given up to commercial enterprise. All the large and handsome courtyards and entrances along the principal streets are now turned into stores and showrooms, and the entrance to the houses is by a narrow passage from the street to the stairways, situated in most cases in the inner part of the buildings. The families who formerly occupied these buildings have now moved to the newer portions of the city, where some really handsome edifices are in course of construction. The same spirit of improvement which has acted upon private persons has also had its effect upon the municipality. During the last three years it has acquired several large and valuable properties, which have been demolished to make the principal thoroughfares wider, so as to meet the requirements of increased traffic. Among others may be mentioned the line of streets starting from the south-western corner of the main square. This line of streets, belonging to the early period of the Conquest, had on its northern side a series of arcades, which in their early days may have been of great service, but owing to the subsidence of the soil they have been gradually sinking, and this, added to the cracks caused by earthquakes, made them a source of danger to the surrounding property. Since 1889 the amount of taxes paid on houses has doubled.

Under Discussion.

TWELFTH CENTURY BUILDINGS IN APULIA.

At a meeting of the Edinburgh Architectural Association last Wednesday, Mr. F. W. Deas, architect, read a paper on "Twelfth Century Buildings in South-Eastern Italy." After a short historical introduction and a description of the character of that part of the province of Apulia which borders on the Adriatic, the lecturer dealt with various churches, dating from the end of the eleventh to the middle of the thirteenth century. These were fairly similar in plan and treatment, having a lofty, narrow nave flanked by side aisles, with recessed chapels; the transept was aisleless, and of the full height of the nave, and no chancel intervened between the eastern apse and the body of the church. The building material was tufa or travertin, with a free use of marble, and the colour of the walls from long weathering was sometimes of great beauty. Splendid as were these churches in their scale, proportion and simple decorative treatment, they were not less noteworthy for the spirit and execution of the carved ornament, which, at its best, ranked beside the noblest carving in the world. This was found more especially at Trani, Bari and Bitonto.

ART EDUCATION.

Mr. Walter Crane said on Thursday last, at the prize distribution at the Camden School of Art and Science, Tufnell Park, N., that though science might claim the first place in popular attention, he thought that the importance of art to commerce was hardly less than that of science. A great deal depended on design, pattern, construction, and form in connection with commercial value, and the importance of art could scarcely be over-estimated. Art was, after all, but the careful cultivation of the natural sense. He ventured to think that if two children received their educational start in life, one on the basis of ordinary elementary knowledge, reading, writing and arithmetic, and the other on what might be termed the graphic and artistic basis, one would be found fully equal to the other at the finish. If there should be any advantage he thought it would probably lie with the pupil who had been trained on the artistic side. He was afraid that we aimed at too high a level of general knowledge and expected equal proficiency from all, forgetting how diverse were our tastes and capabilities. He deprecated the depreciation of ambition in art. Ambition was not discouraged in the gymnasium, why should it be in the art school? If an artist made a great attempt and failed, the effort would be at least educational, and would encourage him to renew his attack. He could not think ambition in art such a crime as it was sometimes considered. The domain of art was like an enchanted forest to students, and though they might wander into by-ways they never forgot the aim with which they entered the wood. Some quest would ever lead them on, and however that forest might have been explored there was still something fresh to be discovered. If they eventually found that truth and beauty were one, and the very soul of art, their aim would have been realised.

THE ARCHITECTURE OF THE EAST.

Professor T. Roger Smith, of London, recently delivered a lecture on "Oriental and Indian Architecture" before the Sheffield Society of Architects and Surveyors. He began by pointing out the differences between Western and Eastern architecture and art generally resulting largely from difference in race, in climates, and in religion. The earliest monuments in India were topes or mounds for the preservation of sacred relics. These are Buddhist and date back to before the Christian era. Round these are procession paths, enclosed by great posts and rails in stone, imitating timber, and profusely enriched. The carving from the Amravati tope, now in the British Museum, was elaborate and extensive. Bhuddism was succeeded by the Jain religion and architecture, whose temples included high roofs and domes and furnished suggestions for what followed. In all Indian architecture profuse ornament and constant repetition were invariable. The high pyramidal roof was constantly met with, also the pier and bracket. Another feature of constant occurrence was slabs of stone perforated in patterns to fill in the windows. Most of the great temples stood in an extensive enclosure, with gateways, with high roofs. Next came the true Hindu temples, which differed in the North and South of India; the high roofs in the North were straight sided and profusely ornamented, while in the South lofty gourd-shaped domes were employed, differently ornamented. The Saracenic or Mohammedan architecture, which was the next type, introduced by Mogul invaders in the eleventh century, had its origin in Arabia, Egypt and Syria. The lecturer described the nature of a mosque, pointed out the early introductions of the pointed-arch Mohammedan buildings in Delhi, Ahmedabad and Agra, and went on to describe in detail the Taj at Agra. The lecture was illustrated by lantern photographs of temples in various parts of India, of the Buddhist tope at Sauchi, and of Saracenic buildings in Cairo and India.

LONDON ART GALLERIES.

Mr. E. T. Cook lectured recently at Toynbee Hall, Whitechapel, E., on "The Art Galleries of London." Mr. Hugh Stannus presided. The lecturer said that in the picture galleries of the metropolis, open free to all, were vast treasures which millionaires might envy, but which no millionaire could ever buy. These collections were obtained for the nation through princely private benefactions and by large public expenditure. And yet anyone who spent much time in the treasure-houses of London was struck by two things—first, that there was scarcely anyone there; and, secondly, that the few who were there seemed terribly bored. There were many reasons for that state of things, the principal one being that visitors tried to see too many pictures at the time, or did not know what points of interest to look out for in them. Pictures, apart from their artistic merits, often possessed accidental points of interest from associations with their painters or former owners, or because they were obtained with difficulty at enormous prices, or were picked up for a trifle and turned out to be treasures; and if those stories of pictures were known, visits to the art galleries would be more enjoyable. The famous Madonna, by Raphael, in the National Gallery—one of the most perfect pictures in the world—was bought, as was generally known, from the late Duke of Marlborough in 1884 for £70,000, far and away the greatest price that was ever paid for a picture. Lest anyone might be inclined to think that this was an extravagant use of the taxpayers' money, it should be known that the purchase was made by that strict economist, Mr. Gladstone. He remembered once hearing Mr. Gladstone refer to the matter. He thought that, looking back on the transaction, Mr. Gladstone's economic conscience had some qualms, but, on the other hand, he had a very good defence. The price given was, Mr. Gladstone admitted, a very large one, but the price demanded by the owner, and even the price recommended by the directors of the Gallery, was very much larger. Mr. Gladstone formed his own opinion of the value of the picture, stuck to the price he offered for it, and after prolonged negotiations it was accepted, with the result that the country was saved £30,000 as compared with the value put upon the picture by Mr. Gladstone's own expert advisers.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the third sessional meeting of the British Archæological Association, held at 32, Sackville Street, Piccadilly, Mr. C. H. Compton in the chair, Mr. R. Quick, curator of the Horniman Museum, read a paper he had prepared upon "The Eolithic Stone Age" which was illustrated by diagrams and a large number of specimens of flint implements. Mr. Quick said it was the opinion of many archæologists about eighteen or twenty years ago that the Palæolithic age was the most ancient period yielding decisive proofs of the existence of man. Since then great discoveries had been made and most scientific men now divided the Stone Age into three epochs respectively; first the Eolithic or dawn of the Stone Age, secondly the Palæolithic or Early Stone Age, and thirdly the Neolithic or Later Stone Age. Upon the plateaux of North Kent, some twenty or thirty miles distant from London, at heights varying from 400ft. to 800ft. above the sea level, many thousands of specimens of flint implements had been discovered, and carefully collected and classified by Mr. Harrison of Ightham. They differed in type from the implements found in the river-gravels or the polished tools of the Later Stone Age. A noticeable feature of difference between the types was the absence of the large massive implements common to the Palæolithic period. The implements found on the plateaux were mostly of small size and fitted for use without a haft, the heads also being generally worked round all the edges so that they could be used in different positions and on all sides. The Eolithic implements might be termed the prototypes of the later implements. Early man did not consider form of importance; he wanted something that he could hand, grip and use as an edged tool. Nature probably suggested the form most suitable amongst these flints for his purpose and a little working of his own upon them gave him all he needed for his simple habits. Many of the implements were naturally split flints which had been worked on one side only, the chipping or working being generally of a character such as could not have been produced by accident or by natural causes; and this chipping appeared always on the side opposite to a good hand grip, which fact must have been an important consideration with the primitive man.—The chairman, Mr. Gould, Mr. Williams, Mr. Rayson, and others joined in the discussion that followed.

FORTS OF THE SOUTHERN PICTS.

At the last monthly meeting of the Society of Antiquarians of Scotland, held at Edinburgh, Dr. D. Christison, the secretary, gave an account of the ancient forts of Perth, Forfar, and Kincardine shires. This region is well marked off by nature and by the isolation of its forts from other groups, and, with Fife included, comprises the historical area of the Southern Picts. The forts may be classified for description as: (1) remains marked "mote" or "moat" on the Ordnance maps, and others which seem to resemble them; (2) forts apparently mainly or entirely of earth; (3) forts apparently mainly or entirely of stone; and (4) sites with little or no definite remains, excluding, however, the so-called Roman camps. Although some six or eight resemble military motes, there is only one that closely corresponds to the type, namely, Cairn Beddie, the Macbeth's Castle of the "Statistical Account." Of the dozen or so of earthern forts, the best example is Green Castle, on Ferdun Water, near Fettercairn. Of the stone forts, which number twenty-three, several are among the largest and most interesting in Scotland, such as the Caterthuns, Dundurn, Caisteal Mac Tual, on Drummond Hill; Barry Hill, Alyth; Finhaven, Abernethy, Forgandenny. The Laws, Monifieth, and Dundee Law. Dr. Christison specially referred to the famous Dunsinnane, and a remarkable example, hitherto almost unknown on Turin Hill, near Forfar. Dunsinnane, which has had more notice than most Scottish forts on account of its association with Shakespeare's Macbeth; it was partially excavated in 1854. There seems no doubt that it was surrounded by a dry stone wall, with well-faced castings, standing on solid rock, and that the so-called underground houses within it were really above ground, also on the solid rock. Referring to the general conclusions as to the positions of the forts, it seemed that there was a marked distinction between the low position of the earthworks and the lofty position of the stone forts. Comparing this district with Argyle, for instance, in which there were few or no earthern forts, the size and preponderance of the forts of stone was the characteristic feature of the former. A variety of these stone forts had attracted much attention and speculation on account of their showing more or less vitrifaction, and the distribution of these was an important question, for which there was scarcely sufficient information yet collected. Much still remained to be done in the way of careful surveys and judicious excavation before it was possible to arrive at final conclusions.

In another paper, Dr. James T. Richardson, North Berwick, described two ancient interments and a kitchen midden recently discovered in that neighbourhood. The latter consisted of a cist measuring about 3ft. by 2ft, at a depth of about 18in. only below the surface. In one of the bunkers recently formed in the Rhodes Links pieces of old pottery were exposed by the drifting of the sand, and on digging to the depth of 3ft. an area of fine black earth, about 15ft. by 9ft. and about 2ft. deep in the centre, thinning off to the outer margin, was disclosed. A well-marked stratum of shells ran through it, and pottery, bones and wood ashes were mingled through its substance. The pottery included a fine buff-coloured ware, a red kind with a greenish glaze, and a very coarse grey variety, and there were at least twenty different patterns of rims. It was found possible to reconstruct one of the vessels sufficiently to show that its shape was oval, with sides nearly perpendicular and measuring 7in. in depth by 11in. in the longest diameter, the inside being coated with a bright yellowish glaze and the outside encrusted with soot.

Correspondence.

ELLIPSE BY COMPASSES.

To the Editor of The Builders' Journal.

Walton-on-Thames.

Sir,—When writing the above article I was not so sanguine as to suppose that everyone would at once and entirely endorse what was therein written. Opinions differ upon any subject, and especially will this be the case upon such a matter as the present one.

Replying to Mr. Marsden's letter in your issue of the 13th inst., allow me to say that it is necessary for Mr. M. to know the difference between "the compass" and "the compasses" in connection with an ellipse. He is not quite correct in saying, "This article is supposed to be the execution of an impossibility." I will not go so far as to say the impossibility is dead, but it is so eliminated that it is practically so, so far as describing the figure of an ellipse with compasses is concerned.

Mr. Marsden says he "is greatly interested in the striking of this curve"; yet, just previously, he says it cannot be struck. If he has a better method than mine for doing it I am glad, and hope he will soon make it public. We are well aware that approximate ellipses have been drawn for centuries—Mr. Marsden says "many hundred years." We also know that for the want of a better method, these more or less approximate substitutes are used every day at the present time, as anyone who takes his walks abroad, in daylight, may see for himself.

With regard to the statement of the S. and A.D., while acknowledging the greatest respect for those in authority upon the matter, I attach more importance to the opinions of half-a-dozen practical men whose occupations require the frequent use of the compasses in describing ellipses. I have met more than one Science and Art student who did not know how to describe an ellipse by trammel, much less how to erect a perpendicular at any point on the curve. It is necessary to thoroughly understand the construction of these figures before we can with satisfaction to ourselves set them out on paper. Any novice can very easily test his curves if he understands how to find the foci of an ellipse; this is simply shown in the article of the 6th inst. Take any number of points on the curve, and from the foci draw two straight lines to any one point on the curve; the lines thus drawn from the points on the major axis to the point on the curve form a triangle, the two legs will, if added together, exactly equal the major axis of the ellipse, that is, if the curve be correct.

There are, of course, many ways of describing ellipses, but I am afraid we must call the result in every case an approximate one in order to avoid hairsplitting. For instance many use the "string and pins" method; others use "cotton and needles;" others lines; others find points in the curve, then fill in by use of French curves, or by hand, for drawing on paper; while others use the trammel, elliptic compasses, or ready made elliptic curves.

To return to Mr. Marsden. He says, "I think that anyone who draws the curves to a large size—that is, one by the use of the trammel and the other by this "new" method will easily see that with given axes the curves do not agree."

I have "drawn" semi ellipses from half-an-inch, up to 3ft., major axis, on paper easily and correctly, and have no hesitation in saying they can be described much larger with but slight modification of the longer radius. His statement that "no approximation gives such a beautiful line as the true ellipse" is equivalent to saying that a spurious half-a-crown is not so desirable as half-a-crown of sterling silver, which fact is recognised by almost everyone. Sir, in order to make more clear that what I wrote in your issue of December 6th is of easy accomplishment, namely, the construction of ellipse by compasses and straight-edge only, I am willing to submit to you, for the inspection of any number of gentlemen who may be interested in the subject, and who will pass an unbiassed opinion upon them, any further drawings of a similar nature to those already published in your paper. The drawings will be sufficiently explanatory of themselves in order not to intrude more than absolutely necessary upon valuable time. I do not think I can do more than this, but I will gladly do it, so as to give your readers generally an idea that such an operation is not so difficult as it seems to be.—Yours truly, ROBERT RAMM.

Temporary Art Gallery for Hampstead.—Acting upon suggestions made by Sir L. Alma-Tadema, R.A., Mr. G. Storey, A.R.A, Mr. David Murray, A.R.A., and the Hampstead Art Society, of which her Royal Highness Princess Louise is the patron, the Works Committee of the Hampstead Vestry have decided to allow the small hall of the Vestry Hall on Haverstock Hill to be used as a temporary art gallery.

Carpenters' Company Examination Result.—The Carpenters' Company held their annual examination in Sanitary Building Construction at their Hall on December 7th and 9th, the number of entries being quite up to those of previous years. The series of free lectures held to help the candidates proved very successful, and the attendance was greater than ever before. Among the examiners were Professors T. Roger Smith, Henry Robinson and A. Wynter Blyth, and Mr. John Slater, B.A., F.R.I.B.A. The following is the list of successful candidates, arranged in order of merit:—Gold medals: Messrs. Alfred Carter and A. C. Remnant (equal). Silver medals: Messrs. A. Harrington and G. P. Knowles (equal). Bronze medals: Messrs. C. B. Burnett, C. W. Denny, W. H. Richardson Jones and A. D. White (equal). Certificates: Messrs. C. A. Sales, J. Greenwood, Hugh Byron and W. Sargeant (equal), A. W. Holley, H. Prosser, Ernest Leney, and Scott Addison. Three candidates sat to improve their positions, but failed to do so, though they fully maintained their former positions. Their names do not appear in the above list.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

PALLADIO'S "CLASSIC ARCHITECTURE."

Cardiff.—Leigh writes: "Will you kindly inform me what is the value of Vol. I. (dated 1776) of Palladio's work on classic architecture."

The book is not worth more than 5s.

BOOKS ON MONUMENTAL WORK.

Nottingham.—Monumenta writes:—"Can you give me some particulars of books on monumental work and estimating?"

"Ancient Sepulchral Monuments," by William Brindley and W. Samuel Weatherley, F.R.I.B.A., containing 212 full-page plates (15in. × 11in.); price £3 3s. "Estimating," by George Stephenson; price 5s. 6d. "Alphabets Old and New," by Lewis F. Day; price 3s. 6d. These books can be obtained from B. T. Batsford, 94, High Holborn, W.C.

STRENGTH OF CONCRETE SLABS.

Greenhithe.—F. J. W. writes:—"The article on page cxl. of the supplement to the Builders' Journal for December 6th on the strength of concrete slabs would be exceedingly interesting if only it contained a little more information as to the size of the slabs. The breaking weights are carefully recorded, even including the odd pounds, and yet the only definite dimension given, beyond the respective thicknesses, is contained in the statement that 'all were 4ft. wide.' Presumably, this means 4ft. clear span between the supports. It would be well if you could ascertain and publish the superficial area of the slabs, so that the load per foot super. could be calculated."

We have ascertained that the twelve slabs were of the following lengths: Nos. 1, 2, 6 and 10 were 8ft. long; Nos. 3, 5, 7 and 11 were 6ft. 6in. long; and Nos. 4, 8, 9 and 12 were 5ft. long. As stated, all were 4ft. wide.

POWERS OF A CONTRACTOR.

Anxious writes:—"A contractor has been building for me and has failed to complete within the specified time. My architect has not deducted the penalties from the account, according to contract, his excuse being owing to extras, wet weather, &c., and my taking possession before completion. He has certified for the balance to be paid to the contractor. If I refuse to comply with the certificate, has the contractor power to sue, and, if he does so, what is my best course to adopt?"

"Anxious" can be sued by the contractor. He could set up the penalties as a set-off or counter-claim to whatever sum they may amount to, but would be met by all or some of the grounds on which the architect has justified his certificate. I do not think he ought to defend an action, if brought, and he ought to avoid having an action brought against him by paying the certified amount or anything less that the builder may under the circumstances be willing to accept. A. H.

CUBING BUILDINGS FOR COST.

Moseley.—F. S. M. writes:—"How do architects cube up their drawings so as to give their clients an approximate estimate? Take, for instance, a billiard room, 30ft. by 25ft. by 10ft., to be built of plain brickwork, with best tiles and fittings."

The ordinary mode of cubing a building for approximate cost is to take the area from the ground plan and multiply by the height from bottom of footings to half-way up roof. This may, however, require to be done in portions, when the building is not a rectangular block, as in the case of back additions not reaching the full height. Chimney stacks, buttresses, dormers, unless very unusual in number or construction, would be disregarded. The boundary walls may be taken as a separate item. The rate per cube foot will depend entirely upon the class of building and amount of decoration. A first-class detached dwelling house would be from 9d. to 15d.; a house of ordinary construction and medium decoration from 7d. to 9d.: a cheaply built suburban house from 6d. to 7½d. In speculative building the price can be kept down as low as 4d. or 4½d. per foot when the houses are built in terraces, but this does not allow for an architect's fees. "Leaning's Quantity Surveying" (Spon; 15s.) gives considerable information on pricing out per foot cube in various classes of building. Small buildings cost more in proportion than larger ones of the same style, and additions to existing buildings cost more on account of renewals to existing parts and making good old to new. A billiard room as described might cost from 9d. to 1s. per cube foot. HENRY ADAMS.

AUTHORITY OF DISTRICT COUNCIL.

E. J. E. writes:—"Plans of a proposed store having galvanised iron sides and roof are submitted to an Urban District Council, who approve them, provided that the building has 20in. stone walls and a roof covered with slates. (1) If the proprietor disregarded this decision and commenced erecting the building with galvanised iron, could the Council stop him? (2) Does a store come under the same by-laws as stables and dwelling-houses? The following are extracts from the local by-laws:—'With respect to the structure of walls of new buildings, for securing stability and the prevention of fires. The walls of every new building shall be constructed of such thicknesses as shall be approved by the Board, and the foundations shall rest on solid ground, or upon concrete, or upon other solid substructure. The external and party or side walls of every new building shall be constructed of brick, stone, or other hard and incombustible substances, unless the Board shall otherwise allow. The roof . . . shall be formed of, or externally covered with, incombustible materials, except in special cases, when otherwise allowed by the Board.'"

(1) Upon the information furnished, it does not appear that the proprietor of the building in question can disregard the decision of the Council. (2) A store appears to be a building of the warehouse class, subject to similar rules to those which govern the structure of walls to dwellings and stables, except that warehouse walls are usually required to be of greater thickness. It appears that the Council have power to exempt the building in question, but have not thought proper to do so. It is just possible, however, that the building may be exempt, independently of the Council's decision. Among the model by-laws of the Local Government Board relating to new streets and buildings, by-law 2A exempts certain buildings from the rules governing the structure of walls and allows such buildings to have walls of galvanised iron, &c. But have the District Council in this case adopted this particular by-law, and, if so, does it apply to the building in question? These are points upon which our correspondent might seek further information. G. H. B.

In an Article on Petersham Common in our issue for November 22nd we drew attention to the possibility of the destruction of that as yet unspoiled beauty spot. This risk is now remote, for, at the meeting of the Richmond Town Council last week, the offer of Lord Dysart to sell, subject to certain conditions, the whole of his manorial rights over Petersham Common (the slope of Richmond Hill) for £500, was accepted. The Lords of the Manor claim the right to cut the fine old timber on the common, and the effect of the sale would be to prevent any risk of this disfigurement of the landscape.

Professional Practice.

Aberfeldy.—Sheriff-Principal Jameson has just issued his decision in an appeal from the judgment of the late Sheriff Grahame in an action raised by Mr. William Bell, architect, Aberfeldy, against Mr. J. Guthrie Lornie, of Pitcastle. The plaintiff sued for a sum of £63 17s. 1d., being his account for professional services rendered to the defendant during a number of years. The defender took exception to several items in the account and submitted a counter claim. He tendered a sum of £38 8s. 9d. in settlement of the account sued for. Sheriff Grahame gave judgment in favour of the plaintiff for the amount sued for (less £2 2s.), and awarded him expenses. The defendant appealed to the Sheriff-Principal, who, after hearing the agents of the parties, has issued an interlocutor adhering to the Sheriff-Substitute's interlocutor, dismissing the appeal and finding the plaintiff entitled to additional expenses.

Armley, Leeds.—At a meeting of the Leeds Library Committee last week, the assessor appointed by the Leeds Corporation to decide who should receive the awards of £50 and £20 respectively offered for the best plans sent in for a new library and reading room at Stocks Hill, Armley, gave his report. The first prize he gives to Mr. Percy Robinson, architect, Albion Street, and the second to Mr. F. W. Bedford. Mr. Robinson's design shows a handsome structure, in which are provided a general reading room, an adult reading room, a juvenile reading room, and a lending department. The carrying out of the scheme will cost about £5,000.

Birkenhead.—On Tuesday in last week the opening of the Gladstone Liberal Club was performed by Dr. Spence Watson, president of the National Liberal Federation, who was presented with a gold key by the architect. The building is erected of brick with Pen-y-cae stone dressings, the front being faced with red pressed bricks. The accommodation includes a spacious billiard room for three tables, smoke room, reading room, secretary's office, refreshment bar, and lavatories on the ground floor. On the upper floor there is an assembly hall for 400 persons, a green room, and the storage and heating arrangements. The building is well warmed and ventilated, and fitted with every convenience for concerts, dances and banquets. The architect was Mr. T. Taliesin Rees, F.R.I.B.A., Birkenhead, and the contractors were Messrs. John Lee and Son, Bebington.

Falkirk.—A new Volunteer drill hall of the C and D Companies 4th V.B. Argyll and Sutherland Highlanders at Falkirk has been opened. It is built of red sandstone and has frontages to Comely Park Terrace and High Station Road. The building facing High Station Road is a two-storey one. On the ground floor there is the armoury (fitted for 300 rifles and equipment), officers' room, non-commissioned officers' room, orderly room store, and lavatories. On the upper floor there is a large reading and recreation room, and here also is situated the house of the sergeant-instructor. Behind this building is situated the drill hall proper. The hall is 100ft. in length and 60ft. wide and in the rear is a large store for gymnastic apparatus, &c. It has a plain but substantial front, and on the gable top is carved the regimental crest, consisting of entertwined L's for Louise, with the Princess' coronet; whilst on either side there is a representation of a boar's head and cat, the crests of the families of Argyll and Sutherland respectively. Messrs. A. and W. Black, Falkirk, were the architects of the building, the cost of which is about £2,500.

Ipswich.—The new church of St. John the Baptist has just been consecrated at Ipswich. The church erected some years ago provided seating accommodation for less than 400; the new church will hold something like 800 persons when quite full, but seating accommodation has been provided for 600. It is situated on the same road and within a few yards of the old church. The outer and interior walls are of red brick, with Monks Park stone dressings, the roof being of pitch pine, with Broseley tiles. The interior consists of a nave and side aisles, a clergy vestry at the north-west corner, communicating with a choir vestry. At the opposite corner is the organ chamber, the chancel being situated midway; the east window, with five lights and Gothic top, faces the roadway. The roof of the nave is supported off the clerestory walls, and the pillars dividing the nave from the aisles are of red brick, alternately circular and octagonal. The chancel is approached from the nave by four steps. Cathedral glass has been utilised for the windows. A four-light window at the west end is placed immediately over the roof of the baptistery, this portion of the façade being completed by a bell-turret, with provision for two bells. The space allotted in the organ chamber is 18ft. by 11ft. 9in. The pulpit is a handsome one of carved oak. The church was designed by the late Sir A. Blomfield, A.R.A., and Sons. The work has been carried out very satisfactorily by Messrs. Cornish and Gaymer, of North Walsham, under the superintendence of their foreman, Mr. George Gotts. The cost has been about £7,700, including the site and the furnishing. The church will be lighted by gas, Messrs. Hart, Son, Peard and Co., of Drury Lane, W.C., supplying the fittings and the Matchless Gas Lighting Syndicate the burners. The organ was formerly in the other church, but it has been added to by Mr. Thurston. The font also was brought from the other church, as it was given originally as a memorial. The lectern, which has been subscribed for as a memorial, consists of a handsome brass eagle and pedestal. The church chairs were made by Messrs. R. D. and J. B. Fraser, who were also entrusted with the carrying out of the whole of the church furnishings. The ground around the church has been tastefully laid out by Mr. F. Beer; and a number of shrubs and trees have been planted in the borders.

Leeds.—At a meeting of the Leeds Markets Committee held on December 12th it was definitely decided to recommend the City Council to adopt the plans prepared by Messrs. Leeming and Leeming, architects, Westminster, for the erection of a new market hall on the site of the present covered market in Kirkgate. Some months ago, it will be remembered, the Committee offered three premiums for the best plans submitted to them, and Messrs. Leeming secured the first premium of £150. The carrying out of their plans was estimated to cost £73,000. But at the Committee's last meeting it was resolved to have the building made two feet higher, so as to allow a little more space on the first floor, an alteration which will increase the cost by about £7000, bringing up the total to £80,000. Built of stone, the structure will be two storeys high, with a frontage of 275ft. to Vicar Lane, and with smaller frontages to Ludgate Hill and Kirkgate. It will cover an area of about 3000 square yards, or rather more than the present market. The position will be slightly different owing to a strip of land about 30ft. wide being required for making Vicar Lane a uniform width of 75ft. Additional land at the rear will, however, be taken by the incorporation of Harper Street, and this will more than equalise the area taken off the front of the present site. The designs show a structure in the Renaissance style surmounted by domes and turrets, and the building is surrounded by twenty-three large shops fronting Vicar Lane, Kirkgate and Ludgate Hill. In addition, eighty-six smaller shops are shown fronting in the market. About half of these are in the balcony. In the middle of the market, underneath the central dome, is a large ornamental clock, around which are a number of stalls. Altogether, there is space for eighty-four open stalls. The roof will be of glass, the outside framework being covered with lead. Two main entrances are shown—one at the junction of Vicar Lane and Kirkgate, the other at the corner of Vicar Lane and Ludgate Hill. Over each of these is a dome. The decision of the Committee, of course, requires the confirmation of the Council before tenders can be invited to carry out the work.

Plymouth.—At the last quarterly meeting of the Plymouth Borough Council two stained-glass windows in the north wall of the Council Chamber were unveiled. They were designed by Messrs. Fouracre and Son, of Plymouth, who executed the principal stained-glass windows in the Guildhall, and have been provided by the family of the late Alderman Edward James, in memory of their father. The windows typify two highly interesting periods in English history—the Elizabethan and the Victorian. At the top of the Elizabethan window the tracery is cinque-foil, circumscribing a large circle. The five cusps are filled with Tudor roses and the circle with a large portrait of Queen Elizabeth in full court dress. The quatre-foils under are filled by the arms of Elizabeth and Plymouth. Under this, the four lights are subdivided and filled with eight Elizabethan figures — all natives of Devon and Cornwall. First is most appropriately the renowned Sir Francis Drake, standing with the globe, allusive to his circumnavigation, and backed up by shipping of the period. The next figure is Drake's eminent contemporary, Sir John Hawkins, represented in partial armour. Sir Walter Raleigh, poet, statesman, courtier and soldier, comes next, and he is represented in the window richly dressed and holding a book, with the potato flower at his feet. At his side stands his half-brother, Sir Humphrey Gilbert, the great navigator, holding a mariner's compass. Sir John Hawley, the left-hand figure at the bottom, born at Dartmouth, was one of the great merchant princes of Elizabeth's time, distinguished for his public spirit, which led him to undertake many noble exploits for the country at his own charge. Near him stands the figure of Nicholas Hillyard, an Exeter worthy, who achieved fame as a portrait and miniature painter, as well as being jeweller and goldsmith to King James. The last two figures in the Elizabethan window are those of Richard Carew, the celebrated author of the survey of Cornwall, who was born at Antony in 1555, and the celebrated Sir Richard Grenville, whose gallant fight in the Revenge against fifty Spanish galleons is historic in British naval annals. In the Victorian window the tracery is similar in character to that already described. Her Majesty Queen Victoria occupies the large circle, with Imperial emblems in the five cusps, and the quatre-foils contain the arms of Cornwall and the late Alderman James. Of the eight Victorian figures, Sir Joshua Reynolds, the famous portrait painter, comes first, and next is that of Sir Humphrey Davy, the Cornish scientist who invented the miner's safety lamp. John Couch Adams, the distinguished astronomer, and Charles Kingsley, the author, occupy positions lower down, the figure of Kingsley being shown standing near Bideford Bridge. Naval and military heroes of the period are represented in the figures of Lord Exmouth, who distinguished himself in more than one sea fight in the early part of the century, and Colonel Chard, whose heroic defence of Rorke's Drift is still fresh in living memory. Grouped together at the bottom of the window are the figures of Richard Trevithick, the inventor of the locomotive, and Samuel Laylor Coleridge, the poet. Below the windows the Council have placed a brass tablet recording the circumstances of the gift.

Wharfedale (Yorks) Infectious Diseases Hospital Competition.—Twenty-six competitors sent in plans for the infectious diseases hospital which it is proposed to build for the Wharfedale Union. The plans signed "Anti-Microbe" (by Messrs. Blackwell and Thompson, of Leicester) have been accepted. They provide a hospital that is estimated to cost £12,940, and, if estimates can be secured for the execution of the various works at something like this figure, the Board will award Messrs. Blackwell and Thompson the first prize. Pending this result, the second prize has been withheld.

Keystones.

Public Baths and Halls at Kinning Park, Glasgow, which are proposed to be built, are estimated to cost £17,642.

New City Mortuary.—On Saturday last the Lord Mayor laid the foundation stone of the new buildings at the City Mortuary in Golden Lane.

A new Workhouse Infirmary at Warwick is to be erected by the Board of Guardians. The buildings will be in two blocks and are estimated to cost £9,000.

Building Collapse.—About six o'clock on Saturday morning a concrete flooring, 100ft. by 80ft., collapsed at a building in course of repair at 46, Worship Street, Finsbury, killing one man and injuring four others.

A New Fire Station at Edgware Road, N.W., is being built at an estimated cost of £13,210, in addition to £98 for stores. The site has cost £7,195 15s. 9d., and the station is expected to be completed by August, 1900.

The Queen's Theatre, Keighley, is being rearranged and enlarged at a cost of about £20,000. When completed, it will seat nearly 2,000 persons. There is a frontage of 86ft. to Queen Street and the total area of the site is about 7,000 square feet. Mr. Frank Matcham, of London, is the architect.

Sir Edward Poynter, P.R.A., has been presented with the honorary freedom and livery of the Worshipful Company of Turners "in recognition of his distinguished services to English art." With regard to the opening of art exhibitions on Sunday Sir Edward said: "Certainly, the best thing for the best day."

"The Luckie Horseshoe" which Mr. Harry Hems found at Exeter thirty-three years ago was celebrated again on December 9th at a dinner attended by nearly a hundred of the craftsmen employed at the firm's studios. Mr. Harry Hems himself presided and his eldest son, Mr. Greville C. Hems, took the vice-chair.

Sir John Donnelly has retired, after forty years' service as head of the Department of Science and Art at South Kensington. At the recent complimentary dinner which was given to him Sir John Gorst said that when Sir John took the reins of the science branch in 1859 the number of persons attending the classes was 395, and the payments were under £2,000. In 1897 the number of students under instruction was £197,796, and the grants were £169,000.

Overcrowding in Manchester. — The Sanitary Committee of the Manchester City Council have resolved to recommend the purchase by the corporation of an estate of 237½ acres at Higher Blackley, for the purpose of erecting workmen's dwellings, in order to relieve the overcrowded areas of the city. The chairman of the committee (Mr. Alderman Walton Smith) says that the utilisation of the land for this purpose will be a very gradual process. His view is that it shall be held as a reserve against future contingencies. Part of it might also be let out in allotment plots and gardens.

The City of London Corporation.—At their meeting last week it was referred to the Library Committee to make the necessary arrangements for an exhibition in the art gallery during the summer of 1901 of works chiefly by Velasquez and Fortuny, at an expense not exceeding £500, exclusive of insurance. On the recommendation of the City Lands and Improvements and Finance Joint Committee it was also agreed that the corporation should co-operate with the London County Council in the endeavour to secure the preservation, on account of its historic associations, of the house No. 17, Fleet Street (known as Cardinal Wolsey's Palace), and that a contribution of £2,500 should be made towards the purchase of the freehold, provided the building was not allowed to overhang the public way, but was set back to the general line of the street improvement, and that the decorated room on the first floor was preserved for the public benefit.

Accident at Dublin.—Whilst a large block of stone was being placed in position on a railway bridge in Dublin last Thursday, it overturned, killing one man and injuring three others.

King's School, Canterbury.—Last Friday the Primate laid the foundation stone of the buildings about to be erected for the extension of King's School, Canterbury, at a cost of about £4,000.

The Death of Mr. George Robinson Brock, at the advanced age of ninety, took place at St. Leonards-on-Sea last Wednesday. Mr. Brock was for many years attached to the Royal Engineer establishment at Chatham as Instructor in Architecture to officers of the Royal Engineers there.

The Edinburgh School of Applied Art.—The drawings, which are largely architectural in character, executed during the past year by the students of the School of Applied Art, of which Dr. Rowand Anderson is director, are at present on public exhibition in the galleries of the Royal Scottish Academy.

The Glasgow Master Wrights' Association held their quarterly meeting last Thursday, Mr. Alex. M'William, president, in the chair, when a lecture was delivered by Mr. James Chalmers, architect, on "The Mansions of Scotland." The secretary, Mr. James L. Selkirk, C.A., intimated that the directors were ready at all times to receive communications from members on matters relating to the interests of the association.

New Municipal Offices at Scarborough.—A Local Government Board inquiry was held at Scarborough last Friday relative to the application of the corporation for sanction to borrow £14,000 for the purpose of adapting the St. Nicholas Mansion, which stands on the newly-acquired St. Nicholas estate in the heart of the town, for municipal offices. At present the offices of the different departments are scattered, and the object is to concentrate them. There was no opposition.

Clergy and Artists' Association.—In consequence of differences of opinion at a meeting of the Clergy and Artists' Association, held at Leighton House on December 15th, the Bishop of Rochester, Sir William Richmond, R.A., Canon Gore, Canon Scott Holland, Mr. Henry Holiday, Mr. A. G. Walker, several members of the committee, including the Hon. Mabel de Grey, Miss Emily Ford, and the Rev. Percy Dearmer, and a considerable number of other members, have decided to resign their membership of the association. A provisional committee was formed after the meeting to take steps for constituting a new association with the same objects.

Peterborough Cathedral Restoration.—The process of "restoring" Peterborough Cathedral goes on apace. Part of the scaffolding around the unsurpassed west front has been removed only to be placed on the other side. The annual report of the Restoration Committee, which was issued on Saturday, showed that £2,925 had been expended this year, and that another £1,267 was needed to complete that portion of the scheme already in hand. There are additional parts of the edifice which need restoring, the cost of which is estimated at over £5,000. If this is raised, more than £130,000 will have been spent in restoring the cathedral during the past half-century.

The Central Society of French Architects has announced the results of their general election of officers as follows:—M. Alfred Normand, member of the Institute, president; MM. Duchatelet, Lalanne and Beignet, of Angers, vice-presidents; MM. Poupinel, principal secretary; L. George assistant secretary, and Gustave Olive, secretary; Boileau, recorder; Nizet, treasurer. MM. Bartaumieux, Daumet, member of the Institute, and Lucien Etienne, censors. MM. Daunay, Degeorge, Achille Hermant, Paul Sédille, Frantz Jourdain, Louis Bonnier and Paul Wallon, Parisian members of the Council. MM. A. Bellemain, of Lyon; L. Gillet, of Châlons-sur-Marne; E. Paugoy, of Marseille; and Loquet, of the Roche-sur-Yon, provincial members of the Council.

New Patents.

These patents are open to opposition until January 22nd.

1898.—Cement Kilns.—17,696. J. C. Swan, Newcastle-on-Tyne. When this kiln is started the slurry, for example, is run through tubes at the top into a continuation, below which is a water-jacketted extension connected with a gas producer or furnace. The mass is partly fritted and then falls down into a cooling chamber, whence it is withdrawn from time to time. Air is admitted under pressure to the furnace to raise the heat, and air is let into the cooling chamber to cool the clinker.

Automatic Lathes.—17,758. J. H. Weiss, London (*W. P. Preble, New York*). This invention consists of an automatic turning lathe which is provided with a chuck carriage mounted upon a reciprocating bed-plate, and so constructed as to present succeeding longitudinal portions of the material to the revolving cutter: mechanism for imparting a proportionate reciprocation to the chuck carriage laterally to the cutter and a continuous revolution to the material; and a cutter mounted on a carriage which is fixed to a bed-plate automatically operated to bring the cutter into and out of contact with the material to be cut. In lathes of this kind, when set, articles of any one pattern, such as knobs, buttons, balusters, &c., can be continuously produced.

Imitation Marble.—24,086. D. Laffan and C. J. Bury; both of Dublin. A glass sheet is first washed over with a solution composed of: resin, 1lb.; ammonia, 2oz., boiled with size and alum, 2oz.; and boiling water, 7 gallons. This prepares the surface. The colours are then thrown on with a brush, or broom, or otherwise, and a coating of white lead, 1lb.; terebine, ½ pint; and spirits of turpentine, ½ pint, is then put on, which brings up the colours. A thick coat of whiting and size is then applied, and afterwards a backing of Brunswick black or gas tar, which may be sprinkled over with sand to form a key for the plaster or cement.

Drying White Lead.—24,211. East Ferry Road Engineering Co., Limited, and others, London. Instead of spreading it in a thin layer over heated tables, the lead is spread on a series of supports mounted on a central shaft which is revolved. Hot air is admitted as required, and there are adjustable scrapers which can be brought into operation to scrape off the dried material. The whole of the working parts are enclosed and no poisonous dust can escape. It is stated that the drying is much more rapid than by the old method.

Pipe Cleaners.—26,097. G. F. Restall, London In one modification the brush is mounted on a screwed part of the rod or rope, so that when this is pulled backwards and forward, the brush, acting like a nut, rotates. By another method friction rollers are employed to work through bevel gearing and revolve the brush shaft.

Cutter Blocks.—27,107. A. A. Atkin, Birmingham. The block has a cylindrical body slotted longitudinally to receive the cutting irons, which are held by screws. Below the cutting edge of each is a mouth which collects and directs the shavings so that they do not fly all over the worker. It is claimed that by the use of these blocks a better finish is put on the work and there is less danger of personal injury.

Waterproofing Materials.—27,118. J. J. Ingham, Bradford. For waterproofing cloths or for forming roads or roofs, the following mixture (boiled together) is used:—Rock asphalte, 4 parts; bitumen, 2 parts; and 1 part each of Stockholm and Norwegian tar and Archangel pitch. Sand may be added.

1899.—Venetian Blind Fittings.—1,704. J. W. Stidolph, London, S.E. On the bottom lath are fixed shallow metal boxes, through the centre of which the blind cord passes and is tied in a knot. In the boxes are buckles by which the tapes are fastened, while each has a snap lid. When cleaning is done this invention is said to be much more simple than the untacking of the tapes by the present method.

Fireplaces.—13,263. H. W. Roberts, Newmarket. The fireplace is built of glazed bricks between the ordinary jambs of a chimney breast and becomes integral with the wall. The sides incline downwards and inwards, and the back consists of bricks laid slightly inclined to the horizontal and sloping towards the front. An ashpan is provided below the grate, but no metal pieces are required for fixing.

The following specifications were published on Saturday last, and are open to opposition until January 29th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—18,158, Weiss (*Preble*), lathes for turning or shaping wood and other materials. 24,501, Ellen, acetylene generators. 25,081, van Kannel, revolving doors. 25,275, Boult (*Carré*), fireproof paint or composition. 25,304, Haddan (*Rudolph Koepp & Co.*), process of manufacturing artificial stone. 25,730, Kossov Wisehew and Sofronow, safety locks for doors, &c. 25,943, Webb, method of protecting or packing glazed and other bricks, tiles, and other goods. 26,194, Herbert, machine for moulding spigot and socket pipes, flange pipes, &c. 27,156, Leslie, apparatus for consuming smoke and fumes in factory and other chimneys and economising the heat generated. 27,205, Duncan, incandescent burners and mantle supports. 27,228, Geipel and Lange, regulators for hot-water heating apparatus. 345, Simpson and British Non-Flammable Wood Co., Ltd., fireproof compositions for painting or covering the surfaces of wood or other materials.

1899.—458, Mendel, bolts for doors. 1,496, Whitehouse and Billings, oil-stone or hone case or box. 1,830, Fischer, windows. 1,925, Forrest, device for facilitating the teaching of drawing, sketching, &c 1,941, Hirst and Murphy, electric incandescent lamp pendants or brackets. 2,766, Welsby and Ward, guards and riving knives for use with circular saws. 2,921, Neill, manufacture of bricks. 2,938, Ward, kilns, ovens, or arrangements for drying stone and similar material. 3,072, Dalman, theatre and analogous chairs. 3,663, Biebuyck, closets. 7,139, Morgan, apparatus for closing doors, gates, casements, &c. 14,266, Mennell, Mennell and Walls, guard for circular saws and similar machinery. 17,406, Matthews, acetylene gas machines. 19,027, Wright, Jones, Robinson and Dunn, new method of forming ornamental terminals on hollow stair rods. 19,615, Ninnemann, water taps. 19,659, Boyd, air pump for testing soundness of chimneys, drains, &c. 19,700, Lake (*Healey*), machines for cleansing sewers or drain pipes. 20,917, Koringer and Lagus, means for raising and lowering windows. 21,035, Kellner, manufacture of acetylene gas.

COMING EVENTS.

Wednesday, December 20.

Provident Institution of Builders' Foremen and Clerks of Works.—Ordinary Meeting of members at 8 p.m.

Society of Arts.—Mr. H. Bloomfield Bare, F.R.I.B.A., on "Bi-manual Training by Blackboard Drawing." 8 p.m.

Trades' Training School, 155, Great Titchfield-street, E.C.—Presentation of prizes by Professor W. C. Unwin, F.R.S., at Carpenters' Hall, London Wall. 8 p.m.

Thursday, December 21.

Institution of Civil Engineers.—Students' Visit to the Generating Station of the Westminster Electricity Corporation, and also to the Works of the Shingleton Ice Company, Eccleston-place, S.W. 2 p.m.

Royal Aquarium.—Gas and Allied Trades Exhibition opens.

Friday, December 22.

Glasgow and West of Scotland Technical College Architectural Craftsmen's Society.—Mr. Isaac Low on "Water Closets and their Connections." 8 p.m.

Saturday, December 23.

Dundee Institute of Architecture, Science, and Art.—Mr. Charles Soutar on "Some Local Cathedrals" 7 p.m.

New Companies.

Askam Brick Company, Limited.

This company was registered on December 8th, by V. Thomassett, 60, Watling Street, E.C., with a capital of £10,000 in £1 shares, to acquire any mines, minerals, quarries, stone, iron, metals, coal, and other substances or products, and to carry on the business of manufacturers of and dealers in bricks, tiles, pipes, terra-cotta, &c. The first directors (to number not less than three nor more than five) are H. Mellon, R. F. Mathews, G. S. Heath, and J. Field. Qualification, £300. Remuneration, £50 per annum, divisible. Registered office: The Brick Works, Askam-in-Furness.

Thomas Blezard, Sons and Co. (1899) Limited.

This company was registered on November 24th by Cartwright and Co., 60, Watling Street, E.C., with a capital of £15,000 in £1 shares, to acquire the business carried on at Greenbank Foundry, Padiham, Lancashire, to adopt an agreement with J. Wolstenholme, and to carry on the business of hot-water engineers, iron and brass founders, &c The first directors (to number not less than two nor more than seven) are to be appointed by the subscribers. Qualification, £100. Registered office: 6, St. Mary's Gate, Manchester.

Llanelly and District Electric Lighting and Traction Company, Limited.

This company was registered on November 29th, by H. J. Leslie, 15, Union Court, Liverpool, with a capital of £50,000 in £1 shares, to carry on the businesses of electricians and electrical engineers, producers and suppliers of electricity for the purposes of light, heat, or power; as manufacturers of and dealers in cables, lamps, and electrical plant and apparatus of every description; and also as manufacturers of and dealers in all kinds of chemicals; to erect and maintain destructors, and to deal with all kinds of refuse; to construct and maintain rail and tram roads, wharves, piers, docks, warehouses, and other buildings; as manufacturers of and dealers in mortar, artificial stone, dealers in coke, coals, wood, oil, clinker, and other articles of all kinds, &c. The first directors (of whom there shall be not less than two nor more than five) are to be elected by the signatories. Qualification, £100. Remuneration to be fixed by the company.

Talbot and Co., Limited.

This company was registered on December 1st, by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £10,000 in £1 shares, to acquire the business carried on by Frank Talbot, A. Talbot, and Alfred Talbot at Leeds under the style or firm of Talbot and Co., and to carry on the business of artists in stained-glass, embossers, etchers, gilders, iron, copper and other metal ventilator and casement manufacturers, &c. The first directors (to number not less than three nor more than fifteen) are to be appointed by the subscribers. Qualification, £250. Remuneration as fixed by the company. Registered office: Bowman Lane, Leeds.

Provincial Estates Company, Limited.

This company was registered on December 2nd, by R. Fitch and Co., 42, Furnival Street, E.C., with a capital of £20,000 in £10 shares, to adopt an agreement with John Hayhurst, to acquire and deal in real and personal property of all kinds, and to carry on the business of builders, contractors, decorators, &c.. The first directors (to number not less than three nor more than five) are J. Hayhurst, J. Parker, and C. H. Vesey. Qualification, £500. Remuneration as fixed by the company. Registered office: 29, York Street, Sheffield.

Societe Des Etablissements Voillereau et Pasquier, Limited.

This company was registered on December 5th, by H. B. Brandreth, 10, Union Court, E.C., with a capital of £24,000 in £4 shares, to adopt an agreement with A. Voillereau, E. Pasquier, and P. de Bacre, and to carry on the business of office and shop fitters, furniture manufacturers, &c. The first directors (to number not less than four nor more than seven) are to be appointed by the subscribers. Qualification, 100 shares. Remuneration, 20 per cent. of the net profits after 5 per cent. is paid.

Holton Estate Company, Limited.

This company was registered on December 6th, by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £5,000 in £10 shares, to acquire land, to erect dwelling-houses, shops, warehouses, and other buildings, and to carry on the business of builders, contractors, painters, &c. The first directors (to number not less than two nor more than four) are to be appointed by the subscribers. Qualification, £100. Remuneration as fixed by the company. Registered office: 4, Holton Road, Barry.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

ALRESFORD (Hants).—For the erection of vagrant wards, laundry, &c., at the workhouse, for the Union Guardians. Mr. W. H. Hunt, architect, Alresford. Quantities by Mr. E R. Babbs, Hook, Surbiton:—

Mussellwhite & Son	£1,4 4 0 0	Boscomb	£1,098 0 0
Tucker	1,267 0 0	Eddotts, Alresford*	1,076 17 6

* Accepted.

BEXLEY (Kent).—For the erection of school buildings for the School Board. Mr. J. Ladds, architect, 7, Doughty-street, Mecklenburgh-square, London, W.C. Quantities by Mr. Alfred Boxall, 8, Adam-street, Adelphi, W.C.:—

T. D. Graty	£5,880	Garlick and Crutchfield	£5,530
Martin, Wells, and Co.	5,789	T. G. Sharpington	5,430
Pryer and Co.	5,613	J. Lonsdale, Swanley Junction*	5,227
Thomas and Edge	5,556		
West Bros.	5,552		

* Accepted subject to approval of the Education Department.

CHISWICK.—Accepted for the erection of two detached villas, Spencer-road, Chiswick. Messrs. Palgrave and Co., architects, 28, Victoria-street, Westminster:—

Mead and Burton, Chesham	£2,600

HARWICH.—For levelling, paving, &c, Stour-street, St. Nicholas, for the Town Council. Mr. Henry Ditcham, Borough Surveyor, 7, West-street, Harwich:—

Horan and Son	£1,318	Smith and Son, Witham (accepted)	£1,200
H. J. Stone	1,300		

[Surveyor's estimate, £1,186 3s. 4d.]

LONDON, E.C.—For the erection of new printing and publishing premises, Norwich-street, Fetter-lane, E.C. Mr. Alfred Conder, architect, Palace-chambers, 9, Bridge-street, Westminster. Quantities by Mr. E. J. Paine, 11, Great James-street, Bedford-row:—

John Greenwood	£10,726	Akers and Co.	£9,294
Harris and Wardrop	10,640	Stimpson and Co.	9,260
F. and F. J. Wood	10,400	E. Toms	8 919
Grover and Son	9,770	J. Appleby	8,790
L. H. and R. Roberts	9,387	Hy. Young*	8,693

* Accepted.

NORWICH.—For extensions to Isolation Hospital, Norwich. Mr. Arthur E. Collins, city architect:—

Warburton	£10,812 6 1	J. S. Smith	£11,174 5 11
Downing	11,948 0 0	J. Youngs, Norwich*	10,849 0 0
J. Hurn	11,070 0 0		
G. E. Hawes	11,500 0 0		

* Accepted.

Heating and Ventilation.

Bailey and Co., Parsonage-buildings, Manchester	£878

OTLEY (Yorks).—Accepted for the erection of seventeen houses, Jennett's-crescent, for the Leeds Industrial Co-operative Society, Limited. Messrs. Fairbank and Wall, architects, 3, Manor-square, Otley:—

Masonry.—Renwick and Son, Otley	£4,062 10
Joinery.—J. H. Dennison, Otley	
Plumbing.—E. Mawson, Otley	
Plastering.—Honroyd and Sons, Bradford	
Slating.—H. Thornton, Otley	
Painting.—Bennett and Son, Otley	

PARKSTONE (Dorset).—For the erection of club premises, Ashley-road, Upper Parkstone, for the Heatherlands Unionist Association. Mr. Walter Andrew, architect, Parkstone:—

T. C. Rigler	£1,150	A. and F. Wilson	£1,015
Burt and Nick	1,148	Baker and Pearcey, Parkstone*	945
W. J. Cross	1,140		
J. Hillman	1,118		

* Accepted.

SOUTHERNDOWN, Wales.—For rebuilding the "Dunraven Arms" Hotel. Messrs. Linton and Barker, architects, Westgate-chambers, Newport:—

Wm. Moore	£5,850	Richards and Evans	£5,497
D. J. Davies	5,821	D. Davies	5,420
D. L. Jones	5,758	Phillip Gaylard, Bridgend*	5,350
C. H. Reed	5,620		

* Accepted.

WOLVERTON.—For new additions to envelope works, for Messrs. McCorquodale and Co., Limited. Mr. H. Phelps Drew, architect, 33, King-street, Covent Garden, W.C.:—

Honour and Son	£2,049	T. P. Robinson, Wolverton*	£1,755
H. Martin	1,881		

* Accepted.

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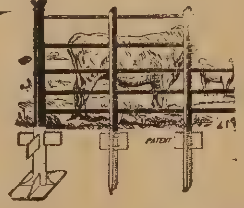

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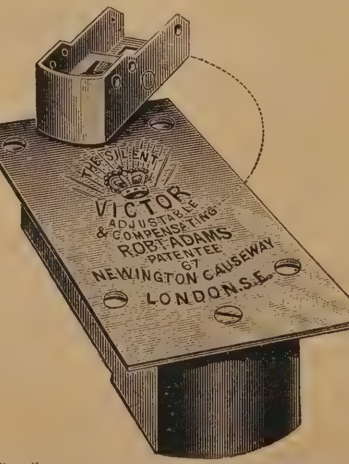

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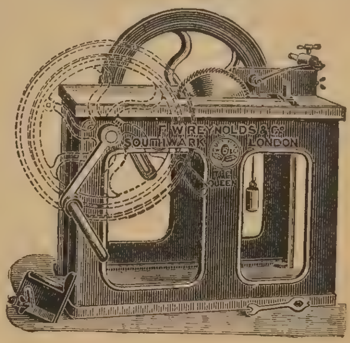

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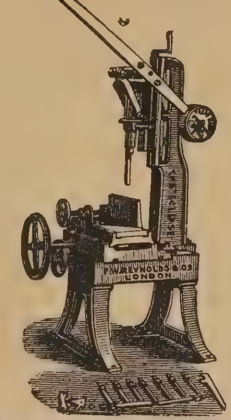

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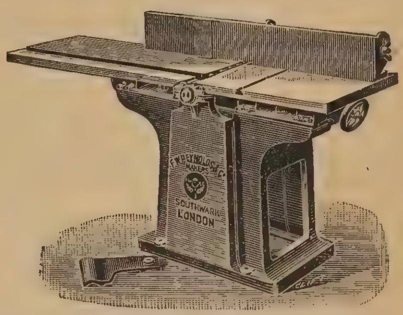

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Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 9 0	—
Linseed Oil	per cwt.	1 1 10½	—
Petroleum, American ...	per gal.	0 0 7 3/8	0 0 7½
Do., Russian ...	per gal.	0 0 6 3/8	0 0 6½
Pitch	per barrel	0 8 6	—
Tallow, Town	per cwt.	1 5 0	1 7 9
Tar, Stockholm	per barrel	1 5 0	1 5 6
Turpentine	per cwt.	1 17 6	—
Lead, white, ground, carbonate	per cwt.	1 3 0	1 4 0
Do. red	per cwt.	1 0 4½	—
Soda crystals	per ton	2 17 6	3 0 0
Shellac, orange	per cwt.	3 3 0	—

METALS.

Copper, sheet, strong ...	per ton	84 0 0	—
Iron, bar, Staffs. in London	do.	9 10 0	11 2 6
Do. Galvanised Corrugated sheet ...	do.	15 0 0	—
Lead, pig, Spanish ...	do.	17 0 0	—
Do. do. English common brands	do.	17 10 0	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	18 10 0	19 0 0
Do. pipe	do.	19 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	do.	9 15 0	10 15 0
Tin, Foreign	do.	109 10 0	110 0 0
Do. English ingots ...	do.	113 0 0	—
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	25 0 0	—
Do. Spelter	do.	20 10 0	20 15 0

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Do. Petersburg	per bundle.	0 1 4½	0 1 5
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd.	do.	12 10 0	12 15 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	17 15 0	18 0 0
Do. do. 2nd „	do.	10 10 0	12 0 0
Do. do. Unsorted „	do.	10 15 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	8 0 0	16 10 0
Do. White Sea	do.	10 10 0	17 15 0
Do. Quebec Pine, 1st...	do.	19 5 0	24 10 0
Do. do. 2nd	do.	16 10 0	—
Do. do. 3rd &c.	do.	9 5 0	9 15 0
Do. Canadian Spruce, 1st	per P. Std.	11 15 0	—
Do. do. 3rd & 2nd	do.	9 0 0	9 5 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	8 15 0	9 10 0
Flooring Boards, 1 in. prepared, 1st	per square	0 10 0	0 12 0
Do. 2nd...	do.	0 9 6	0 11 0
Do 3rd &c.	do.	0 9 3	—

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Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4½	—
Do. Honduras	do.	0 0 4 15/16	—
Do. Tobasco	do.	0 0 4 7/16	—
Elm, Quebec	per load	12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 3/16	—
Do. African ...	do.	0 0 4 9/32	—
Do. St. Domingo ...	do.	0 0 6¼	—
Do. Tobasco ...	do.	0 0 4 15/16	—
Do. Cuba ...	do.	0 0 9 27/32	—
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	10 0	16 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown...	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 9	0 3 5

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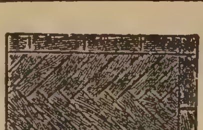

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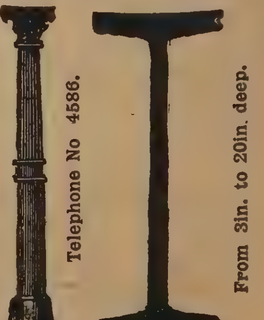

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DIFFICULT FOUNDATIONS AND SUBSTRUCTURES.*

By H. NORMAN LEASK.

THE subject of difficult foundations and substructures is one which would meet with varied treatment at the hands of many experts, so, aware of the diversity of opinion, it is my intention to say little that is original, and to give examples founded on precedent and brought to successful issues by some of the chief architects and engineers of the day.

As is well known, foundations are the most essential portion of any structure that is reared above the earth's crust. It is therefore of paramount importance that they should be carefully considered when a structure has to be erected on a site of doubtful, unknown, or known evil reputation, more especially when the magnitude and use of the structure is such that it involves the public safety.

I would suggest that in the case of any structure the site should be carefully surveyed, both as to extent, contour, and stratification, either by trial borings or shafts—a piece of gunbarrel proving very useful, or, better still, the jet system of trial boring. The reasons for so doing are obvious and hardly need mention. In the first place, there is scarcely a more prolific source of extras than foundations; then again the method often pursued defeats its object, that is, in many cases, the buildings are laid out, the trenches excavated and inspected by the architect, who is either satisfied with the stratum found or orders additional depth to be made. In the case of a hard crust overlying a softer stratum of considerable thickness, if the hard crust is or may be penetrated so that merely a thin layer of it stands intact over the soft stratum, the structure is liable to bear through it, resulting, if not in loss of property, in the development of unsightly ruptures both internal and external to the structure. Another reason is the sense of security possessed when one is aware of the conditions that exist, permitting the necessary precautions to be taken in devising special means to the end in view, namely, the stability of the structure and economy in its erection.

Having said so much as to the best method of procedure before designing the foundations—or, for that matter, the structure itself—I will now draw your attention to what may be termed "difficult foundations." It is really not so much the difficulties encountered, as it is almost possible to erect a structure on any stratum and ensure its stability, but the doing so economically.

Difficulties are rare in Dublin, and are confined to isolated areas and riverside sites, and the nature of the soils in these areas is either alluvial deposits or made ground and running sand. But throughout the provinces, in Belfast, Dundalk, and Cork, varying conditions will be and have been met with, so I will touch on conditions and combinations that, to my knowledge, exist, and give a few of the most important and successful methods adopted elsewhere to ensure the stability of the structures reared on similar sites.

What are Difficult Foundations?

It may be asked what may be classed as difficult foundations? Well, in my opinion, they are of three distinct kinds, with combinations of all: first, natural difficulties, and second and thirdly artificial difficulties.

FIRST CLASS.—Natural difficulties arise out of the nature of the strata underlying the site for the proposed structure, such as quick or running sand, sand unconfined, sand with water, bog land, marsh, alluvial deposits of considerable depth, spongy wet clay needing draining, recently made ground, ground of unequal bearing power, such as part rock, or other incompressible material, and part clay.

SECOND CLASS.—Artificial difficulties. The nature and use of the building often requires special methods, even when the nature of the site under ordinary conditions would be deemed excellent for building upon.

THIRD CLASS.—The proximity of other buildings—their use and the nature of their construction, as well as the depth and nature of their foundations, where this latter is unknown—eccentrically loaded footings may be entailed, which are at any time objectionable. The use of piles may be precluded owing to the vibrations caused by driving them. The sinking for a basement or foundations may cause a hydrostatic or inclined pressure to be thrown on a wall never designed to receive such, and thus involve litigation and loss of money and time. As these difficulties are countless, it is only possible to touch on some of them here.

I will now draw your attention momentarily to the following table of the bearing power of earths, &c. It was compiled by Mr. A. T. Walmisley, M.I.C.E., and given in a paper on London foundations read before the R.I.B.A., in June, 1898.

	Lb. per Sq. Ft.		Lb. per Sq. Ft.
Alluvial deposits	1,000— 1,500	Ordinary sand and gravel	4,000— 5,000
Dry made ground	2,500— 3,500	Ordinary confined	8,000—12,000
Moist clay	2,000— 3,000	Ordinary rock	18,000
Dry compact clay	4,000— 5,000	Granite in Tower Bridge	32,000
Thick clay	6,000—10,000	Brick in Tower Bridge	26,000
Loose sand	2,000— 6,000	London Clay	8,000
Compact sand	4,000— 6,000	Safe limit for last	4,000
Confined sand	10,000—15,000		

If you work out the weights of some buildings and their contents you will find that even soils of high bearing powers will be overloaded when the structures are erected on them, unless special measures for the distribution of the weights are adopted.

As settlement is commonly to be expected in some soils, and unequal settlement is to be avoided, we must therefore proportion as exactly as possible the area of the footings supporting the various loads that have to be taken up. I will now turn to the various methods at the disposal of the engineer or architect with which to overcome the difficulties.

Piling.

Piles are the means most frequently adopted in this country when the nature of the soil is such as needs consolidation, or where the structure has to be supported almost entirely independent of the immediately underlying strata. Piles are of two kinds—bearing and resistance piles. The first are driven to a hard underlying strata capable of sustaining the imposed load, and act as pillars, being greatly assisted by the sustaining power of the surrounding material. It may be assumed that the ultimate strength of the pile is the crushing strength of the timber, or iron, whichever is employed.

The sustaining power of resistance piles—that is, those driven to a given resistance, and sustained by the friction against their sides of the material through which they pass—is ascertained either by experience in the same soils, or by using a formula which will give results approximate to those found in practice. Of formulas for this purpose there are many, but perhaps that evolved lately in America is, I believe, one of the best. I will mention it here, as it is the one on which the New York building authorities base their calculations, and is enforced in their by-laws. It is known as the "Engineering News" formula, and is stated thus:—Twice the weight of hammer in tons multiplied by the fall in feet, divided by the average penetration during the last few blows in inches, plus one a constant to provide for the increased resistance to moving at the moment of impact, which reduces the formula to $P=\frac{f\times w\times h}{S+C}$ where P = the safe bearing resistance, f a factor varying from 2 to 1, and recommended to be taken at 2, giving a factor of safety of 6. W = weight of hammer in tons, S = penetration in inches, C = the constant.

Experiment nevertheless is the safest guide, and it ought to be remembered that it is not right to simply drive one pile and then load it till it settles, but that several piles should be driven at their proposed distances apart and then some of them cut off below the platform on which the test load is to be erected. The reason for this is apparent: the driving of adjacent piles consolidates the material and greatly adds to the sustaining power of each pile. Patton in his work on foundations recommends the above practice.

The sinking of iron screw piles is accelerated by means of a jet of water under pressure, but they are little used in land structures, though advantageous for bridge piers, foundations for lighthouses, promenade piers, &c.

Screw piles have not to my knowledge been used in any land structures, but sand piles have been used, and will continue to be used, as they are very reliable. Sand piles are inserted by first driving a timber pile and withdrawing it and filling the hole so formed with sand—this can only be executed in certain soils which retain the impression made by the dummy for a sufficient period to allow the sand to be inserted. The

Drawbacks to Timber Piles

are first, that they can only be used in wet situations and they must be cut off below the lowest water-line level, thus necessitating in many cases deep excavation through treacherous soils, that need heavy timbering in order to prevent flowing, and requiring in all cases pumping to keep the bottom of the trench dry while the concrete is being placed in position. Then timber piles have the tendency to splinter, or become badly shaken, during driving; also to broom at the point, though this is not so liable to occur when square timber is used shod, as with round timber, such as is mostly used in this country.

Piles often suffer by being over-driven. It is better to put up with a moderate penetration, and a consequent lighter imposed load, than to drive on relentlessly, as is often done. The driving of dummy piles, and other scamping tricks, are less liable to be practised if the contractor is dealt fairly with in this matter.

Iron piles should always have a wide diameter both of pipe and screw, and a low pitch, and should be filled with good cement concrete when in position.

Sand piles are free from the great drawback possessed by timber, namely, to rot or be attacked by insects. A device somewhat similar to sand piling has been used by one of the contractors for the Paris Exhibition, who has consolidated soft soil by stamping with specially devised hammers, using a binding material, such as sand or ashes; the result is stated to be entirely satisfactory. I need not explain the way in which piles are driven or the difficulties encountered in so doing (for such is the domain of the contractor), or how they are treated when finished; but I may say that it is considered better practice to place caps and sills on them rather than to omit these, which, I fear is the more common practice.

The use of piles is commonest in Belfast, Dundalk, and Cork, as far as Ireland is concerned.

Where the soil is chiefly alluvial or made ground, a less expensive method might be adopted by forming a raft of concrete reinforced by means of iron or steel beams, which can be disposed in isolated situations or cover the whole area; for often sufficient piles cannot be driven inside the prescribed space at allowable distances apart, without overloading them. The compression of the surrounding material making it almost impossible to drive the required number.

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* A paper read at Dublin on December 5th before the Architectural Association of Ireland.

Settlement

cannot be altogether avoided unless solid rock is reached, but unequal settlement can be provided against, only, however, by proportioning the area of the footings to the bearing power of the soil in hand consistent with the weights imposed. This often entails great spread of footing, and necessitates loss of space, considerable excavation and loss of material, owing to the necessity of offsets or footing courses. This can be avoided by the use of steel or iron beams acting as cantilevers spaced and dimensioned accordingly, and is only an improvement on the use of timber for extending the footings (in wet ground) either by using layers of thin timbers, or half timbers, placed transversely to each other.

The bearing power of the soil being ascertained, the requisite spread of the foundation arrived at, and the foundations figured out, a layer of concrete from 9in. to 2ft., according to the spacing of the beams, is laid in the trenches, and on this are laid the beams, either transversely or longitudinally. If longitudinally, the underlying layer of concrete may be thinner, and a second layer of beams must be placed transversely immediately over the first set. As each layer is put in, the beams are surrounded with concrete properly rammed between the joists, and on this platform the neat wall may be started. It will be seen at once that there is here an economy both in space and material.

Again, if isolated footings are found to be undesirable, the entire site may be covered with a layer of concrete and the same method pursued, only in this case it is necessary that there should be two layers of joists, and that when their lengths exceed marketable dimensions they should be spliced, both webs and flanges, at all joinings. This method, known as the grille or raft method, will be found to compare favourably with other methods in respect to their stability and economy. The use of beams very useful in transmitting heavy concentrated loads to materials of an inferior crushing strength.

There is yet the time-honoured method of sinking isolated piers to the hard strata, or erecting them on piles, and either springing arches from pier to pier on which the walls can be built, or spanning from pier to pier with a concrete and iron bressummer or iron girders and starting the structure from these. Piers have been built on clusters of piles and the entire site covered by a system of concrete groining, forming a platform on which to rear the structure; this is notably shown at the new ferry house at San Francisco, California.

These systems have their disadvantages, particularly in the case of arches, when provision has to be made to take up their thrust; neither can they be carried out in many soils.

The sinking of piers either of concrete, masonry, or brick through great depths of unstable material leads to the use of

The Pneumatic Method

of sinking cylinders. Hitherto this method was only applied to bridge structures, and was set aside by the use of open cylinders either of timber, iron, or brick, excavated by a grab dredge; but when in water-bearing strata, or when the soil was inclined to flow, it did so, and often endangered the adjoining structures as much as an open excavation would, and so the pneumatic process became indispensable when it was desired to reach an unyielding strata without endangering adjoining buildings. To quote Mr. Patton on the subject:—

"The entire question heretofore of applying this method to ordinary buildings has been one of actual and relative rapidity and cost of construction. If these difficulties can be removed there can be no question of the advisability of adopting this method for all important buildings, even if the necessity, from a practical point of view, does not require it—certainly when rock is at no very great depth below the surface, as the feeling of perfect safety as well as the demand for it will justify the increased cost, provided it is not too large a percentage of the entire cost of the structure.

"As buildings become more costly, the smaller will be the percentage of the cost for the foundations, and the greater is the reason—purely from a selfish or economic point of view—for making the foundations absolutely safe and secure, to say nothing of the greater danger to the comfort as well as the lives of the occupants, which imposes a far larger responsibility on the builders."

You will see, therefore, that the pneumatic method is to be advocated, especially when the building is important and the site unsafe; when open excavation is precluded, from its impossibility or disastrous effects; or when piling would either affect the adjacent structures, or enough piles could not be driven to carry the imposed load.

I will now give a short description of a pneumatic caisson. This is essentially an iron cylinder (though it may be rectangular in plan, and constructed of cast, wrought iron or timber), with a working chamber having a cutting edge and an air lock. It is worked on the principle of a diving bell, the pressure in the working chamber being a little in excess of the hydrostatic pressure at the depth under the surface at which the caisson may happen to be, and is kept up by means of air compressers and regulated by valves. The air lock is the means of exit and entrance both for materials and men, and is made as small as possible for the same reason as a lock is on a canal.

The door by which it is entered opens inwards, and the door from it to the working chamber opens inwards to the latter. When necessary, owing to the entrance of water or inflow of material, these doors are closed and the chamber slowly filled with air until the desired pressure is reached. On entering you step into the air lock and close the entrance door, the exit door to the working chamber being kept closed by the excess of pressure in the working chamber over that of the atmosphere. Compressed air is then admitted into the air lock which closes the door, and on the pressure in the lock equalling that of the chamber the internal door can be opened and the chamber entered. Egress of men or material is accomplished by reversing the process in the air lock; and so the work proceeds, the caisson sinking as the material is excavated either by its own or a superimposed weight, it not being wise to decrease the pressure, which would have a similar effect, butwould probably result in an inflow of material.

Sinking caissons is often accelerated by the use of hydraulic jets with their orafices distributed over the external surface, the water in forcing its way through the material acting as a lubricant and diminishing the skin resistance. When the nature of the material through which it is passing permits of it, it is often ejected from the working chamber to the surrounding site by means of a hydraulic ejector, but this can seldom be carried out on a building site as it would flood it in a very short time.

The objections to this system are, cost and difficulty of procuring men to undergo the increased pressure to which they may be subjected, as on entering a caisson one experiences a sharp pain in the region of the ears known as blocking, owing to the unequal pressure on the drum of that organ. This passes away on the pressure equalizing, and by a little precaution may be almost entirely avoided; but on the whole it tends to produce deafness. A greater source of danger is that of reducing the pressure in the air-lock too rapidly, which in some cases has resulted in death or paralysis.

When the caisson has been sunk to the desired strata it is usually filled with concrete or brickwork, on which stone templates, with distributing girders, are placed to take the concentrated loads.

There are other methods of sinking for piers in water-bearing strata, notably that known as the

Poetsch Freezing Process,

which, I believe, was conceived on the Continent and is adopted in America. In order to excavate in such strata the site of the proposed pier is surrounded by a series of tubes of fair diameter, sunk to the bed rock. In these tubes are inserted a flow and return pipe, and all are then connected up in series with a refrigerating plant, and a freezing mixture is pumped through them until the material is frozen. Excavation is then started and carried to the required depth, and the shaft thus sunk is filled with concrete or brick, the pipes being then withdrawn and the process repeated with individual piers. This method has been successfully carried out, but is necessarily expensive owing to the plant and chemicals used.

There is another method of dealing with water-bearing strata, the patent of Mr. R. L. Harris, N.Y., A.M.Soc. Engs., which, with the last process, is fully described in Mr. Patton's work on foundations. It is essentially a method of grouting the strata with liquid cement, and so either building a wall or covering the site with a block of concrete. It is also carried out by sinking tubes to the desired depth, through which the liquid cement is forced and escapes through holes in the surface of the tube, thus permeating the adjacent strata within certain limits ascertained by experience; as the tubes are gradually raised, they form stratas of concrete behind them.

I will now give you some

Examples taken from Actual Practice.

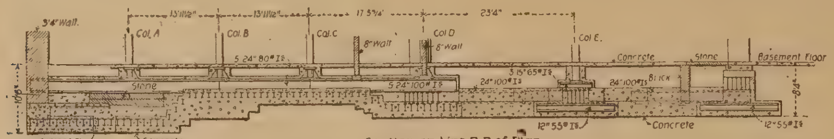
They are chiefly taken from American practice, and the drawings and data are taken, with apologies, from "The Engineering Record," an organ of the engineering and building trades in America. The only excuse I have for so doing is that in America difficult foundations are more commonplace, owing to the vast areas of difficult ground that have to be dealt with; besides the loads are greater in that country than any that have been attempted on this side of the Atlantic, with the exception of engineering structures. The Americans therefore have more experience, and, we may take it, adopt the best means ascertained from continued practice.

The first example, shown in the illustrations on p. clvi, is that of the Singer Building, New York, designed for the Singer Sewing Machine Co. by Mr. Ernest Flagg, architect, New York. It is of the ordinary construction common in this country, that is, brick walls and interior columns, the walls carrying their own weight and their share of the floors and roof with their live loads to their footings. The weight of the building and its contents was such that more than ordinary measures had to be taken in distributing the load over the stratum on which it was built, which was liable to flow when saturated. As will be noticed on the plan the walls adjacent to existing structures had to be placed eccentric to the foundation, which had such an offset as to require special treatment to avoid its canting under the imposed load. This was avoided by embedding in the footing parallel to the wall a number of rolled steel joists, and superimposed on these and let into the wall at one end, was another system of beams, from which they converge to the base plates of the interior columns and are fixed in that position by the weight on the column transmitted to them by means of distributing girders. This object is accomplished at the angles of the building in a similar way, by carrying the reaction girders across the angle under the exterior wall.

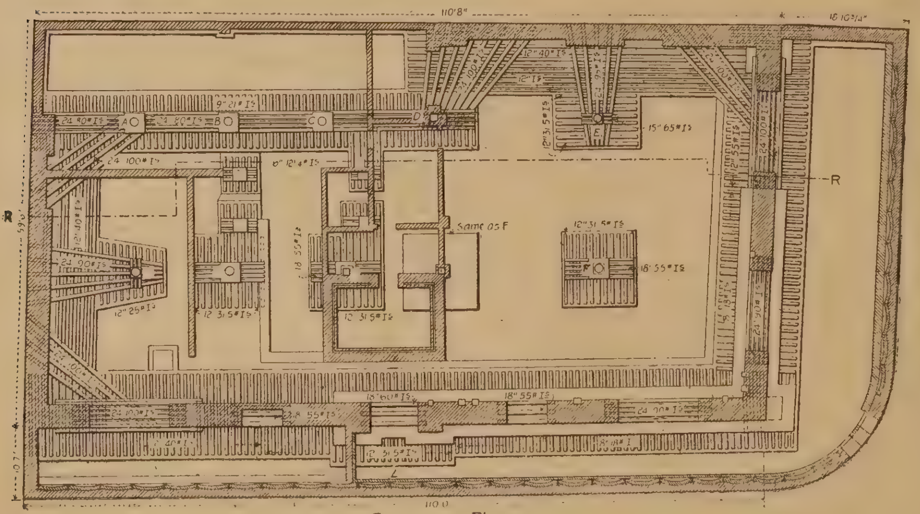
Along one wall, where the footing is 13ft. wide for one portion of its length, the concrete is reinforced by 12in. I-beams, at about 12in. centres, and placed transversely to the wall, which starts from this platform without offsets to the brickwork. The remaining portion is reinforced by 8in. I-beams, at about 12in. centres, but in this case the wall is offsetted to double its width, the walls being about 40½in. thick at their bases. In the case of openings in the basement walls, the foundations are carried through and the openings have sills composed of rolled beams on which templates are laid and the jambs started on them. In all cases the series of imposed beams are in direct contact with each other.

I will now turn to an example which is nearer home, being located near Rings End basin, at the point of the south line of quays, Dublin. It is a four-storey warehouse and basement and will be heavily stocked. The engineer, Mr. R. H. Leask, M.I.C.E., of Ireland, owing to the fact that the soil was made ground, under-laid at a depth of about 20ft. by a bed of gravel, the original bed of the river Liffey, decided to proportion the footings so as to exert a pressure of not more than one ton to the foot super; this required fairly extended footings; so in order to economise space and excavation he decided to make use of steel beams. The opportunity of purchasing tram rails of girder pattern and old style being afforded to him, as the D. U. Tramway Co. were relaying their roads at the time, he so designed the footings as to make use of these rails, as they were to be had at a much lower figure than market sections suitable for the purpose.

The main walls rest on the footings without offset. A bed of concrete, 12in. thick, was laid in the trenches, which varied from 7ft. 3in. wide to 5ft. 6in., on which were laid transversely at 2ft. intervals sections of old sleeper rail from 4ft. 6in. to 5ft. 6in. long, these being flushed up with concrete and the wall started on a further footing of concrete.



Section on Line R-R of Plan.



Foundation Plan.

SUBSTRUCTURE WORK IN THE SINGER BUILDING, NEW YORK. ERNEST FLAGG, ARCHITECT.

In the case of column foundations a layer of concrete, 5ft. 6in. wide and 12in. thick, was laid the entire length of the building, and on it were laid transversely a similar series of beams to the main walls. On these were laid a pair of continuous girder-type tram rails at centres 2ft. 2in. apart. The rails were about 80lb. to the yard, fully fished; and on these, under the columns, spaced at 9ft. centres, are placed three rails, each of which carries about 75 tons, which act as distributors. The piers between the openings were similarly treated. The building is now complete in every detail, and has fully justified the engineer's confidence in the method employed.

As another example I may take a San Francisco building known as Spreckles Building, which is of modern design—that is, of steel cage construction. Messrs. Reid Bros., of San Francisco, were the architects. The nature of the soil on which it was erected is of dense, wet sand, and the building is about 75ft. square; but, in order to reduce the unit pressure to about 4,500lb., it was necessary to extend the supporting medium to about 100ft. square. This was accomplished by first covering the entire site with a layer of concrete 2ft. thick, and on this placing a system of 15in. I-beams (fifty-eight in number) running the entire length, and properly web and flange spliced, and then ramming concrete between and around them. On top of this was placed another system, at right angles to the one below, of 15in. I-beams (sixty-three in number), and similarly spliced, this being again flushed up with concrete. The wall and floor columns were then placed on groups of distributing girders, generally six in number, and 20in deep, placed transversely to the last system, and the columns were then anchored to the girders in the bottom layer, thus ensuring the stability of the structure on its foundation.

My fourth example is that of the foundation to the Manhattan Life Building, New York, of which Messrs. Kimball and Thompson and Mr. C. O. Brown were respectively the architects and engineer. The site was in this case extremely difficult to treat, the substratum being sand and earth with water; and the adjacent structures were much older buildings and their foundations were not carried to the bed rock, which was at a depth of 56ft. from the pavement level. The total weight of the building and its contents would have imposed a load of 7,300lb. per square foot of the area of the lot. Piles could not have been used, as when driven at the regulation spacing of 30in. centre to centre there would have been 1,323 piles, and each would have had to carry something over 45,000lb., which exceeded the limit of 40,000lb. permitted by the authorities of the city. Other means had therefore to be adopted, and, on the recommendation of some eminent engineers, the pneumatic process was used for the first time in a building.

The site was first excavated to the level of the footings of the adjoining buildings, these buildings having being shored up previously, and new concrete footings inserted and the structure underpinned by a patent process of carrying the wall on wrought or cast-iron pipes driven to the back by hydraulic means and afterwards filled with concrete and duly wedged up to reaction beams in the old walls. The caissons were then sunk within 12in. of the old wall line, and so great was the pressure on them that in sinking they were somewhat distorted; after they had reached the rock they were filled with concrete and a brick pier carried up to the bottom of the excavation. These caissons were so placed as to carry very heavy cantilever girders, which carried the interior and wall columns and transmitted their load to the pier by means of steel bolsters resting on a grillage. By this means the weight on the wall and internal columns was transferred to the centre of the caissons, or nearly so, thus avoiding ugly encentric loads. The cantilever girders were about 63ft. long and weighed eighty tons, each having four webs and being 3ft. 4in. wide on the top flange. Of course, this is an unusual case, but many less aggravated cases are similarly treated with evident success.

The most unique example I have to refer to is that of a Birmingham foundation. A valuable site was for many years left vacant owing to the fact that it was obliquely intersected by the Great Western Railway tunnel, and several efforts were made to build on it, but as the authorities would not allow any weight on the arches of the tunnel, which was within 3ft. of the surface, the attempts fell through. At last, however, an architect (Mr. Ralph Heaton) was found courageous enough to adopt a novel method, and in doing so he did not fall short of the courage of our cousins across the Atlantic.

The entire structure was carried on a series of cantilevers of large proportions which rested on piers built close to the wall of the tunnel, the cantilever end projecting over the tunnel to the face line of the building, and the near end resting on and being anchored to another pier. The amount of counter-balancing load was about 160 tons in the case of one of the cantilevers.

Amongst many others worthy of mention is the case of a foundation to a monolithic concrete structure four stories high, walls 16in. thick at base, built on marshy ground, on which a pressure of 2,000lb. per foot super is exerted, which has been treated in a novel manner by a combination of light iron rods and concrete, the rods being ¾in. square and twisted, laid at 6in. centres and being 10ft. long. The total depth of concrete was 18in. and sloped off to 6in. thick at the extreme edge. I might suggest that expanded metal be used in preference to twisted square rods. I think it would be more economical, and serve the purpose as well as it does in concrete floors.

Electricity Power at Salford for lighting purposes and to supply motor-power for tramcars formed the subject of a Local Government Board inquiry last week into the application of the Town Council to borrow £400,000. Nearly £100,000 has already been spent in erecting plant, but a new generating station of 10,000 horse-power will be required.

At the New Balintober Infants' School, Campbeltown, now in course of erection (Mr. H. E. Clifford, of Glasgow, architect), a carefully-planned system of ventilation is being carried out by means of Cousland's improved Climax patent "Natural Exhaust" ventilators, supplied by the Climax Ventilating and Heating Co., Ltd., 93, Hope Street, Glasgow.

Society of Engineers.—At the forty-sixth annual general meeting of this society, held on December 11th, Mr. John Corry Fell, the president, in the chair, the following gentlemen were duly elected by ballot as the Council and officers for 1900: As president, Mr. Henry O'Connor; as vice-presidents, Messrs. Charles Mason, Percy Griffith and James Patten Barber; as ordinary members of Council, Messrs. Joseph Bernays, D. B. Butler, G. A. Pryce Cuxson, W. H. Holttum, R. St. George Moore, Nicholas J. West, Joseph William Wilson and Maurice Wilson; as hon. secretary and treasurer, Mr. George Burt; as hon. auditor, Mr. Samuel Wood, F.C.A. Mr. Fell announced that the following premiums had been awarded by the Council for papers read during the past session: The president's gold medal to Mr. E. Wynter Wagstaff, for his paper on "The Shan Hill Country and the Mandalay Railway;" the Bessemer premium to Mr. R. G. Allanson-Winn, for his paper on "Foreshore Protection, with special reference to the Case System of Groyning;" a Society's premium to Mr. Gordon Harris, for his paper on "Water Supply to Country Mansions and Estates;" and a Society's premium to Mr. Ewart C. Amos, for his paper on "Machine Tools."

Masters and Men.

The Perth Master Blacksmiths have decided to make a substantial increase on the price of all kinds of work done, in consequence of the increase in cost of iron by about 45 per cent, the price of coal by about 30 per cent., and through wages having advanced by about the same amount. It is proposed to shortly form an Association for the purpose of regulating the prices all over Perthshire.

Workmen's Compensation Case.—At Birmingham County Court last Wednesday, before his Honour Judge Whitehorn, an application was made under the Workmen's Compensation Act. In May last a labourer named Edwards was awarded 10s. per week compensation in respect of an injury received while in the employment of Mr. Perrell, builder and contractor. The application now was to terminate the payments, inasmuch as Mr. Perrell had offered Edwards £1 per week as a painter's labourer. The situation, however, was refused. The medical evidence showed that the man was capable of doing such light work as he was offered, but Edwards said he had been a master baker, had only entered the applicant's employment temporarily, and did not want to be a labourer again. He was now selling patent wicks for lamps, and making a profit of about 8s. per week. His Honour decided that the present pay should not be continued.

The December Report of the Amalgamated Society of Carpenters and Joiners shows that in some quarters there has been unfavourable comment upon the apathy of the leading trades unions in contributing either to local or national war funds, and it has been urged that a general levy among trades unionists should be resorted to. Some branches of the Amalgamated Society of Carpenters are in favour of such a levy, as well as of providing for the support of the families of those of their members who are engaged in the war. It appears that the utmost that the 610,000 amalgamated carpenters can do, according to their rules, is to keep all Army Reserve men who are at "the front" in benefit without their being responsible for subscriptions, and the executive finds it necessary to point out that a levy can only be imposed upon members for "trade purposes." This represents the attitude of other trade unions, whose officials, however, urge their members to make individual efforts to augment all funds being raised for the relief of those who may suffer by the war.

Leicester Building Disputes. — At the annual dinner of the Leicester Master Builders' Association, Mr. Porter, president of the Derby association, said in labour disputes it was much better to struggle, even if they lost. They could not let the men have everything their own way; they must fight them. There would be a repetition of the recent struggle with the plasterers and they must be prepared for it. Mr. Arthur Chambers, president of the Leicester association, who was in the chair, in referring to the struggle with the bricklayers' labourers, said that after having passed through such a very severe struggle, which extended over a period of twenty-six weeks, the Association had held its own, and they were almost prepared to say they had had the best of it. Had their members all been loyal they would possibly have given a better account of themselves, but it was a time when several members thought fit to secede from the association. He did not blame them; they had difficulties of their own, and they were to be congratulated on having kept with the Association so long. He was pleased to say that nearly the whole of the seceding firms would pay the fines imposed, and would in a short time be reinstated with the association.

St. John's Schools, Banbury, are being varmed and ventilated by means of Shorand's patent Manchester grates, patent xhaust roof ventilators, and special inlet ubes, supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Surveying and Sanitary Notes.

Mr. Ernest S. Gale, of Falcon Court, 32, Fleet Street, E.C., has been appointed by the Benchers surveyor to the Honourable Society of Gray's Inn.

Clearing Snow for Two Days.—The clearing of the snow from the principal thoroughfares in Leeds during two days last week has cost the Corporation £800. Nearly 5,000 loads have been removed.

Street Paving in Leeds.—Since June last the Leeds Corporation Highways Committee have completed the paving and flagging of eighty-five streets in connection with new estates in various parts of the city, and they have now in hand 163 new thoroughfares. Tenders have been accepted for the paving and flagging of a number of new streets in the districts of Headingley and Holbeck, and the request of the Hunslet Board of Guardians for wood pavement to be put down in front of the Union offices in Glasshouse Street has been granted.

Improvements at Morecambe.—At a recent meeting of the Morecambe Urban District Council the tenders for two of the three sections of the sewerage scheme (estimated to cost £63,000) were considered and remitted to Mr. H. B. Nichols, the consulting engineer, for him to report further. Plans for fifty new houses and for several new streets were passed. The Council was occupied in committee in letting the contracts for the construction of thirty-five new streets at the east and west ends of the town. The Local Government Board wrote sanctioning the loan of £5,000 for a refuse destructor, and the Council resolved to borrow the money at once from the Public Works Loan Board.

A Road Surveyor Fined for Negligence.—Richard Thorton, surveyor to the Drighlington District Council, was recently summoned at the West Riding Court for leaving stones on the highway, to the public danger. It appeared that the defendant had deposited a quantity of broken limestone in a rough state on the Whiteley Road at Drighlington. Only one side of the thoroughfare had been repaired in this manner; the place was left unprotected at night, either by light or otherwise, and the stone had been so irregularly distributed that one side of the road varied from 3in. to 15in. above the level of the other side.—The defendant stated that he had been surveyor since April last, and that he had been connected with the Local Authority for nineteen years. He was not aware that it was necessary to protect roads left in the state complained of.—The Chairman expressed much astonishment at the view.—The defendant was fined £1 and costs.

Institute of Sanitary Engineers.—At a general meeting held on December 13th, the following officers were elected for the year 1900:—President: R. Reynolds Rowe, F.R.I.B.A., &c.; vice-presidents: S. I. Adams (Southend-on-Sea), H. M. Dove (London), J. Farley (Hertford), S. Minty (Bournemouth), W. J. Wells (Reigate), and D. B. Wilkinson (Oldham); council: J. Allan (London), H. M. Apps (Maidstone), F. P. Barber (Rubery, Worcs.), H. G. Beams (Ewell), C. E. Butcher (London), G. H. Carter (London), E. D. Cecil (London), T. W. Deadman (St. Margaret's-on-Thames), Lieut.-Colonel Dixon (Sutton, Surrey), C. Dobbs (Sydenham), J. T. Griffin (Chingford), R. Horton (Chelsea), N. W. Hoskins (New Eltham), W. E. Markham (London), F. W. Mason (Enfield), T. R. Nash (London), E. R. Palmer (Beckenham), F. J. Rayner (Newhaven), W. Strachan (Hemel Hempstead), T. M. Taylor (London), J. Thompson (Southend-on-Sea), and E. H. Wheeler (East Molesey); auditor: R. J. Ward (London); directors: J. W. Wells, and H. M. Dove.

Builders' Notes.

London County Council.—At the meeting of the Council held on December 12th, the Finance Committee presented a return showing that the total debt of London secured on the rates was now £43,349,646, involving a charge on the rates of £2,710,583, of which £1,197,357 was interest and £1,513,226 repayment. Alderman Beachcroft remarked that the debt of London had increased by ten and three-quarter millions during the past six years. The municipal debt of the country had since 1876 been augmented by 140 millions. It was decided to promote the following Bills in Parliament next Session: The General Powers Bill, the Improvements Bill, two tramway Bills, the Spitalfields Market Acquisition Bill, the Rotherhithe and Ratcliff Tunnel Bill, a gas testing Bill dealing with the areas supplied by the Gas Light and Coke, Commercial Gas, and South Metropolitan Gas Companies, the London Water (Purchase) Bill, and the London Water (Welsh Supply) Bill. Details of these Bills will be found on page cxli of the supplement to the BUILDERS' JOURNAL for December 6th last. Mr. Beachcroft called attention to the fact that if the Bills were accepted by Parliament they would commit the Council to an expenditure of no less than £66,250,000, or if they added the light railway and clearance schemes, and the £3,000,000 for drainage, their total liability would be no less than £70,000,000. After much discussion it was decided that Tudor House, in Bromley Recreation Ground, known as "Rutty's House," should be pulled down.

Value of Strand Property.—On December 12th, Mr. Troutbeck and a special jury heard the case of *Hesse* v. *The London County Council*, a claim for compensation in respect of the freehold interest in the premises, 294, Strand, and 34 and 34a, Holywell Street, which will shortly be demolished in order to widen the Strand between St. Clement Danes and St. Mary-le-Strand. The premises in the Strand were let to the Aerated Bread Company, Limited, at £150 a year, and those in Holywell Street to Mr. Gilbert Noble, bookseller, for £150 a year. Alderman Samuel Green (Messrs. Green and Sons) stated that there was a term of eight years unexpired from June, 1898, at this rent, and, capitalising it at six and three-quarter years' purchase, his figure for the present value of the premises was £2,025. The premises would have to be rebuilt at the expiration of the leases and would then command a ground-rent of £301 per annum, which he capitalised on the 3½ per cent. tables (21·7 years' purchase), £6,532. With the addition of the customary 10 per cent. for compulsory sale, his total valuation amounted to £9,412. Alderman Sir John Whittaker Ellis (Farebrother, Ellis and Co.), Mr. Edward Holroyd Bousfield (Fox and Bousfield), and Mr. F. Green (Green and Sons) also gave expert evidence in support of the claim. On behalf of the London County Council, Mr. Edward Boyle called Mr. G. A. Wilkinson, Mr. James Green (Weatherall and Green), and Mr. Howard Martin (Thurgood and Martin), whose valuations ranged from £5,933 to £5,974, including the usual allowance of 10 per cent. for compulsory sale. It was stated that the premises were in the last stage of decay and that the Holywell Street portion was built more than three hundred years ago. After viewing the property the jury assessed the compensation at £6,500, inclusive of the customary allowance for compulsory sale.

Institute of Sanitary Engineers.—At a recent meeting of the Election Committee of this Institute the following were elected. As Members: A. F. Stilwell (Rochford), A. H. Scott (Southend-on-Sea), W. Strachan (Hemel Hempstead), J. F. Davidson (Willington Quay) and J. Ashton (Ormskirk). As Associates: G. F. M. Merriman (Worcester Park), T. M. Taylor (London), J. Holt (Rose Grove) and F. G. Edwards (Highbury).

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		BUILDING—		
Dec.	22	Ben Rhydding, Yorks.—Additions, &c., to the Ben Rhydding Hydro.	The Ben Rhydding Hydro. Co.	Isitt, Adkin and Hill, Prudential-buildings, Bradford.
,,	22	Bootle, Lancs.—Fire Station	Corporation	J. H. Farmer, Town Clerk, Bootle.
,,	22	Manchester—Pulling Down Buildings	Joint Workhouse Committee	A. J. Murgatroyd, 23, Strutt-street, Manchester.
,,	23	Barry, Wales—School Board Offices	Barry School Board	G. Thomas, F.S.I., Queen's-chambers, Cardiff.
,,	23	Halifax—Semi-detached Villas	....	R. Horsfall and Son, 22A, Commercial-street, Halifax.
,,	23	Rawmarsh—School	School Board	J. Platts, Old Bank-buildings, High-street, Rotherham.
,,	23	Whitby—Shelter Seats	Urban District Council	T. K Scott, Flowergate, Whitby.
,,	23	Whitby—Shelter near Coastguard Station	Urban District Council	T. K. Scott, Flowergate, Whitby.
,,	23	Cardiff—New Wards at Workhouse	Guardians	E. Seward, Architect, Queen's-chambers, Cardiff.
,,	23	Ovenden, Yorks.—House and Stable	....	Jackson and Fox, 7, Rawson-street, Halifax.
,,	23	Rastrick, near Brighouse—Rebuilding Inn	Halifax Brewery Company	W. C. Williams, 29, Southgate, Halifax.
,,	23	Gainsborough—House	Urban District Council	P. Griffith, 54, Parliament-street, Westminster.
,,	25	Glasgow—Station Extension	Glasgow and South-Western Rly. Co.	Engineer's Office, St. Enoch Station, Glasgow.
,,	27	Braemar, Scotland—Hospital	Deeside District Committee	Jenkins and Marr, 16, Bridge-street, Aberdeen.
,,	29	Richmond—Alterations, &c., to Laundry	Joint Isolation Hospital Committee	F. C. Greville-Smith, 172, High-street, Hounslow.
,,	29	Walthamstow—Bandstand	Urban District Council	G. W. Holmes, Engineer and Surveyor to the Council.
,,	30	Newcastle-upon-Tyne — Offices and Pupil Teachers' Centre	School Board	W. H. Knowles, 37, Grainger-street, Newcastle-upon-Tyne.
Jan.	1	Carndonagh, Ireland—Station Buildings	Londonderry and Lough Swilly Rly. Co.	Offices of Company.
,,	1	Morcambe—Villa Residence and Stables	Mrs. Emary	A. L. Lang, 12A, Pedder-street, Morcambe.
,,	3	Cilybebyll, near Pontardawe—Isolation Hospital	Pontardawe Hospital Committee	J. Morgan, Surveyor, Herbert-chambers, Pontardawe.
,,	3	London, S.E.—Execution of certain Works	Metropolitan Asylums Board	Office of the Board, Norfolk House, Norfolk-st., Strand. W.C.
,,	4	West Hampstead, N.W.—Branch Public Library	St. John's Vestry, Hampstead	A. P. Johnson, Clerk, Vestry Hall, Haverstock-hill, N.W.
,,	5	Whitley, Northumberland—Council Offices, Fire Brigade House and Stores.	Urban District Council	J. P. Spencer, 13, Grainger-st. West, Newcastle-on-Tyne.
,,	6	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
,,	6	Birmingham—Alterations to Coachman's House	Guardians	W. H. Ward, Paradise-street, Birmingham.
,,	10	Preston—Erection of Post-office	H.M. Office of Works	The Office of Works.
,,	16	Birkenhead—Electricity Generating Station	County Borough	C. Brownridge, Engineer, Town Hall.
,,	26	St. Pancras—Baths and Washhouses	Vestry	T. W. Aldwinckle, 1, Victoria-street, S.W.
No date.		Ashington—Schools	....	Colliery Office, Ashington.
,,		Bradford—Houses	....	R. Drake, Architect, 142, Allerton-road, Allerton.
,,		Brockholes, Huddersfield—Stable	Brockholes Industrial Society	F. Buckley, Secretary to the Company.
,,		Great Yarmouth—Houses	....	21, Howard Street South, Great Yarmouth.
,,		Leeds—Houses	T. Philpotts	5, Leopold-road, Leeds.
,,		North Shields—Business Premises	Isaac Black	W. Hope, Trinity-bldgs., New Bridge-st., Newcastle-on-Tyne.
,,		Styrrup, Notts.—Rebuilding	Worksop and Retford Brewery Co.	Vallance and Westwick, White Hart-chambers, Mansfield.
,,		Rawtenstall, Lancs.—Bakery and Stables	Hartley and Co.	F. J. Hobson, Architect, King-street, Rawtenstall.
,,		Arbroath, N.B.—Slaughter Houses	....	H. Gavin, Architect, Arbroath.
		ENGINEERING—		
Dec.	22	West Bromwich—Electrical Plant	Corporation	A. Caddick, Town Clerk, Town Hall.
,,	23	Blackburn—Electrical Overhead Line Equipment	Corporation	Lacey, Clirehugh, and Sillar, 2, Queen Anne's-gate, S.W.
,,	28	Gloucester—Electrical Plant	Electricity Supply Committee	R. Hammond, 64, Victoria-street, Westminster, S.W.
,,	28	Hull—Electrical Plant	Electric Lighting Committee	City Treasurer's Office, Town Hall.
,,	29	Twickenham—Machinery, &c., at Hospital	Joint Isolation Hospital Committee	F. C. Greville-Smith, 172, High-street, Hounslow.
,,	30	Panama—Aqueduct	Authorities	Commercial Department, Foreign Office, Whitehall, S.W.
,,	30	Manchester—Electric Tramcar Bodies	Tramways Committee of Corporation	J. M. M'Elroy, Tramway Department, Town Hall.
,,	31	Mistretta—Electric Lighting Town	Municipality	Commercial Department, Foreign Office, S.W.
Jan.	2	Llanelly—Reservoir	Urban District Council	H. W. Spowart, Clerk, Town Hall, Llanelly.
,,	2	London, N.E.—Accumulators	Hackney Vestry	R. Hammond, 64, Victoria-street, Westminster, S.W.
,,	2	London, E.C.—Locomotives	Secretary of State for India in Council.	Director General of Stores, India Office, Whitehall.
,,	3	Concepcion—Drainage and Waterworks	Chilian Government	Commercial Department, Foreign Office, Whitehall, S.W.
,,	4	Ceylon—Railway	Government	Crown Agents for the Colonies, Downing-street, London.
,,	6	Glasgow—Electric Traction	Corporation Tramways	J. Young, 88, Renfield Street.
,,	8	Abingdon—Reservoir	Rural District Council	G. Winship, Borough Buildings, Abingdon.
,,	13	London, S.E.—Dust Destructor	Bermondsey Vestry	Town Hall, Spa-road, Bermondsey.
,,	15	Carmarthen—Bridge	Rural District Council	Rowland Browne, 7, Hall-street, Carmarthen.
,,	16	Newcastle-on-Tyne—Generator	New Tramways Committee	C. Hopkinson, 29, Princess-street, Manchester.
,,	20	Ilford—Electric Lighting Plant	Urban District Council	J. W. Benton, Council Offices, Ilford.
,,	22	Glasgow—Machinery	Corporation	D. Home-Morton, 95, Bath-street, Glasgow.
,,	26	Valetta, Malta—Waterway in Tunnel at Sea-level	....	Superintendent of Public Works, Valetta.
		IRON AND STEEL—		
Dec.	23	Garforth, near Leeds—Stores	Colliery	Garforth Colliery, near Leeds.
,,	27	Dublin—Various	Alliance and Dublin Consumers' Gas Co.	Offices, D'Olier-street.
,,	29	Walthamstow—Railings	Urban District Council	G. W. Holmes, Town Hall, Walthamstow.
,,	29	London, E.C.—Rails	Burma Railways Co.	Offices, 76, Gresham House, Old Broad-street, E.C.
,,	30	Donington, Lincs.—Fencing, &c.	Parish Council	A. G. Fletcher, Clerk to Council, Donington.
Jan.	6	Roscommon, Ireland—Water Mains	District Council	C. Mulvaney, Engineer, Roscommon.
No date.		Manorhamilton, Ireland—Goods and Materials	Sligo, Leitrim, and Northern Counties Railway Co.	R. E. Davies, Secretary, Lurganboy, Manorhamilton.
		PAINTING AND PLUMBING—		
Jan.	6	Cardiff—Painting at Workhouse	Guardians	A. J. Harris, Clerk, Queen's-chambers, Cardiff.
		ROADS AND CARTAGE—		
Dec.	22	Hampton Wick—Material	Urban District Council	J. N. Horsfield, District Surveyor, Hampton Wick.
,,	25	Horsham—Broken Granite	Roads and Bridges Committee	W. B. Purser, 31, Bedford-road, Horsham.
,,	27	Bootle, Lancs.—Improvement Works	Corporation	Borough Engineer.
,,	27	Ramsgate—Granite Channelling	Town Council	T. G. Taylor, Broad-street, Ramsgate.
,,	30	London, W.—Works and Materials	St. George's Vestry, Hanover-square	G. Livingstone, 1, Pimlico-road, W.
,,	30	Whitley, Northumberland—Works	Urban District Council	Council Offices.
Jan.	1	Hastings—Road Metal	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
,,	3	Litherland, Lancs.—Sewering and Completing	Urban District Council	W. B. Garton, 25, Sefton-road, Litherland.
No date.		Limehurst, Ashton-under-Lyne—Kerbing, &c.	Rural District Council	S. E. Kettlewell, Surveyor, Parish Offices.
		SANITARY—		
Dec.	23	Sonning, near Reading—Sewering	Wokingham Rural District Council	J. F. Sargeant, 8, Shute-end, Wokingham.
Jan.	1	Pembroke—Sewerage Works	Town Council	Beesley, Son and Nichols, 11, Victoria-street, Westminster.
,,	6	Cheltenham—Sewer	Corporation	Surveyor, Municipal Offices, Cheltenham.
		TIMBER—		
Dec.	27	Dublin—Various	Alliance and Dublin Consumers' Gas Co.	Company's Office, D'Olier-street.
Jan.	1	Bristol—Wood Paving Blocks	Sanitary Committee	T. H. Yabbicom, City Engineer.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan.	31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.
Feb.	28	Doncaster—Isolation Hospital	£25, £15	F. E. Nicholson, Solicitor, Union Offices, Doncaster.
Mar.	12	Belfast—Assembly Hall	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast.
No date		Glasgow—General Hospital for 1,200 patients	£200, £150, £50	J. R. Mortion, 38, Cochrane-street, Glasgow.
,,		Harrogate—Northern Police Convalescent Home	....	Hon. Secretary, St. Georges, Harrogate.

Property and Land Sales.

FREEHOLD BUILDING LAND to be LET on LEASE, or SOLD in PLOTS; fronting on main road, and close to golf links and Highgate Woods; near Muswell Hill and East Finchley Stations. Liberal advances if required to responsible Builders.—For plans and particulars apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington Road, N. 7

HARROW-ON-THE-HILL.—Three acres of eligible Lands abutting on main road, laid out for small villa or cottage residences, five minutes from town and schools and proposed railway station, TO BE LET on Building Lease, or FREEHOLD will be sold. —For terms and particulars apply to BENTWICH WATKIN WILLIAMS and GRAY, Solicitors, Corporation-chambers, Guildhall-yard, E.C.

Sales by Auction for the Year 1900.—Messrs.

DEBENHAM, TEWSON, FARMER, and BRIDGEWATER beg to announce that their SALES for 1900 of ESTATES, Investments, Town, Suburban, and Country Houses, Business Premises, Building Land, Ground-rents, Advowsons, Reversions, Stocks, Shares, and other Properties will be held at the Auction Mart, Tokenhouse-yard, near the Bank of England, in the City of London, as follows:—

Tuesday, January 16th
Tuesday, January 30th
Tuesday, February 13th
Tuesday, February 20th
Tuesday, February 27th
Tuesday, March 6th
Tuesday, March 13th
Tuesday, March 20th
Tuesday, March 27th
Tuesday, April 3rd
Tuesday, April 10th
Tuesday, April 24th
Tuesday, May 1st
Tuesday, May 8th
Tuesday, May 15th
Tuesday, May 22nd
Tuesday, May 29th
Tuesday, June 12th
Tuesday, June 19th
Thursday, June 21th
Tuesday, June 26th
Thursday, June 28th
Tuesday, July 3rd
Thursday, July 5th
Tuesday, July 10th
Thursday, July 12th
Tuesday, July 17th
Thursday, July 19th
Tuesday, July 24th
Thursday, July 26th
Tuesday, July 31st
Tuesday, August 14th
Tuesday, October 9th
Tuesday, October 23rd
Tuesday, October 30th
Tuesday, November 13th
Tuesday, November 20th
Tuesday, December 4th

By arrangement, Auctions can also be held on other days in town or country. Messrs. Debenham, Tewson, Farmer, and Bridgewater undertake Sales and Valuations for Probate and other purposes of Furniture, Pictures, Farming Stock, Timber, &c.

Detailed Lists of Investments, Estates, Sporting Quarters, Residences, Shops, and Business Premises to be Let or Sold by private contract are published on the 1st of each month, and can be obtained of Messrs. DEBENHAM, TEWSON, FARMER, and BRIDGEWATER, Estate Agents, Surveyors, and Valuers, 80, Cheapside, London, E.C. Telephone No. 503, Bank.

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Messrs.

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Other appointments for intermediate Sales will also be arranged.

Thursday, January 11th
Thursday, January 25th
Thursday, February 8th
Thursday, February 22nd
Thursday, March 8th
Thursday, March 22nd
Thursday, April 5th
Thursday, April 26th
Thursday, May 10th
Thursday, May 24th
Thursday, June 7th
Thursday, June 21st
Thursday, June 28th
Thursday, July 5th
Thursday, July 12th
Thursday, July 19th
Thursday, July 26th
Thursday, August 2nd
Thursday, August 9th
Thursday, September 27th
Thursday, October 11th
Thursday, October 25th
Thursday, November 8th
Thursday, November 22nd
Thursday, December 6th
Thursday, December 13th

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

HAMMERSMITH-ROAD, W.—Important Building Site.—Preliminary Notice of Sale by Auction.—Messrs.

CHESTERTON and SONS are instructed to SELL by AUCTION at the Mart, E.C., on THURSDAY, JANUARY 25th, 1900, at TWO o'clock, the valuable FREEHOLD PROPERTIES, Nos. 92, 98, 100, 102, 104, 106, 108, Hammersmith-road, together with Forty-seven Cottages and the Black Horse Beerhouse, in Brook Green-place at the rear, the whole forming an excellent building site of over 1¼ acres. Also the valuable FREEHOLD INVESTMENT, No. 46, Brook-green.

Particulars of Solicitors, Messrs. MILLER, SMITH, and BELL, 3, Salter's Hall-court, Cannon-street, E.C.; Messrs. HASTIES, 65, Lincoln's Inn-fields, W.C; H. P. SMALLPIECE, Esq., Guildford; Messrs. SHORE and KING, Birmingham; E. F. DAY, Esq., Nos. 5 and 6, Clement's-inn, W.C.; and Messrs. CROWDERS and VIZARD, 55, Lincoln's Inn-fields, W.C. Auctioneers' Offices, 51, Cheapside, E.C., and 140, Kensington High-street, W.

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Illustrations sent of Work Executed.
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WOLVERHAMPTON UNION.
ERECTION of NEW WORKHOUSE, &c.—
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The Guardians of the Wolverhampton Union invite applications from competent persons for the appointment of "Clerk of Works" in connection with the erection of their new Workhouse Infirmary, &c., under the direction of their Architect, Mr. ARTHUR MARSHALL, A.R.I.B.A., of King-street, Nottingham.

The person to be appointed must have had a wide experience in buildings of this character, and be fully competent to discharge all duties and responsibilities that will devolve upon him in connection with a large contract (say £150,000).

The salary will be at the rate of £350 per annum.

A suitable person will probably retain the appointment for three years at least.

Applications, stating age and particulars of Qualifications, and enclosing not less than three testimonials, must reach me not later than 9 o'clock on WEDNESDAY, the 27th inst.

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By order,
FRANK HARRISON,
Clerk to the Guardians.
Union Offices,
Wolverhampton. 1

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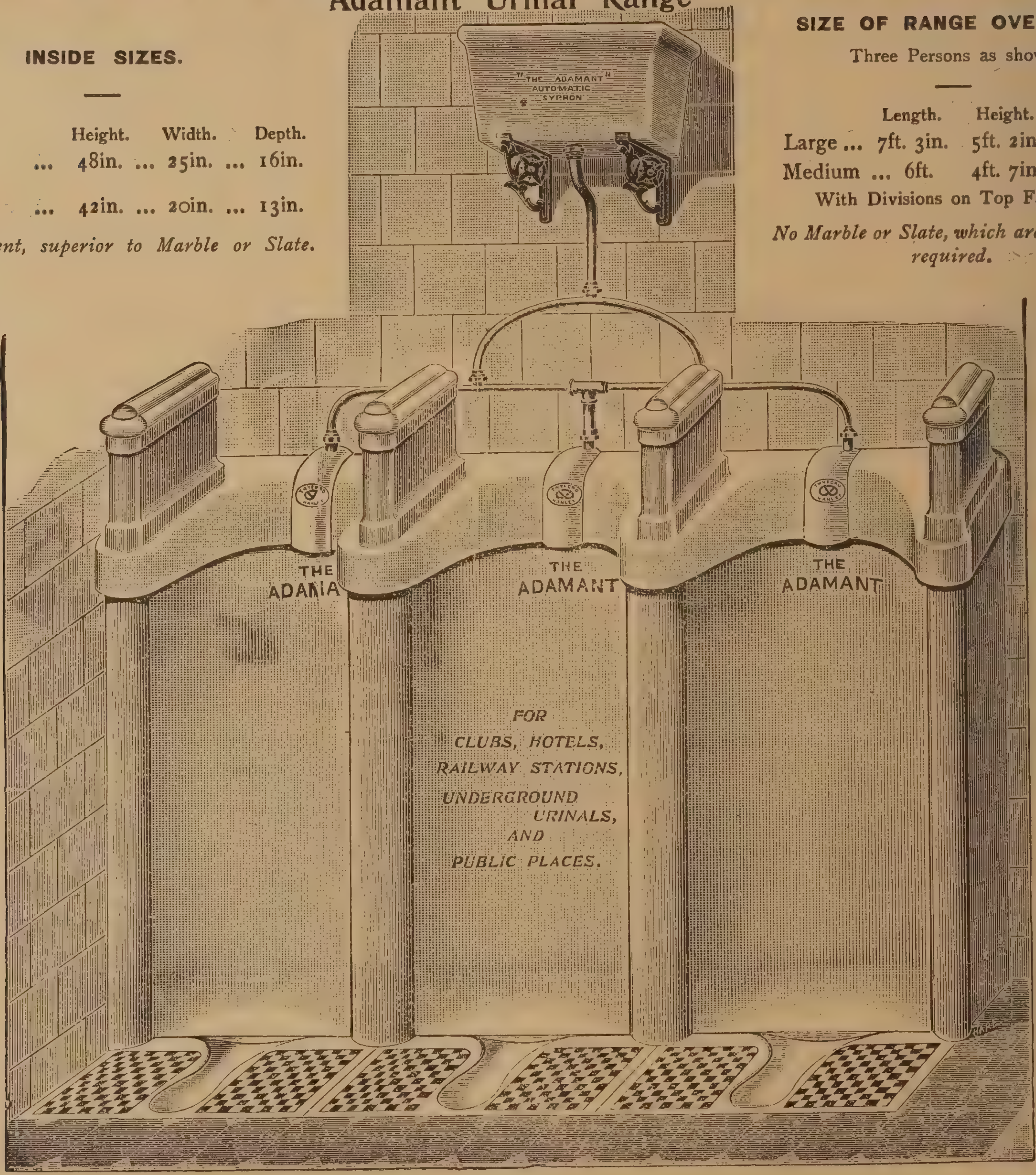
With Divisions on Top Facings.

No Marble or Slate, which are absorbent, required.

Adamant Urinal Range



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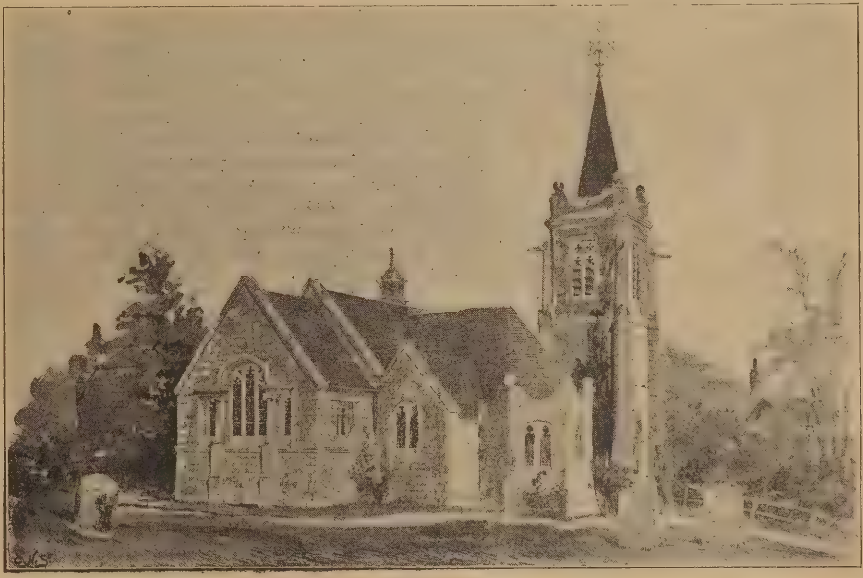
THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS.

December 27, 1899.
No. CCLV.

Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

Tradition in Architecture. According to our dear old Dr. Johnson, tradition is anything that is delivered orally from age to age, a definition which includes two great conditions, that it shall not be written and shall be a continuous process without break or hiatus. Tradition, then, in architecture, is the method of working which has been handed down from father to son; it is the application of those principles which form, or rather should form, the groundwork of the training given by the master to his apprentices, to be passed on by them to their successors. This holds true of the tradition of all countries, in all periods—even the most remote—irrespective of differences of race, of religion, or material available. In fact, tradition in architecture is the evolution of what is commonly called style; it cannot be too clearly understood that the architecture of every country and age was, until the Italian Renaissance, a gradual growth, the outcome of a slowly expanding tradition. For convenience sake the work is catalogued into centuries, but the dates have no bearing on the result. It is of the very essence of tradition that it shall be the common property and inheritance of the whole body of artificers, from the designer, or master mind, who originates, to the humblest artisan who helps to construct the building. The former, if of distinguished ability, may, by adopting a new material, or devising a daring piece of construction, advance a little forward beyond his predecessors; but it is always upon the same path, and those working under him are able to follow easily and naturally in his footsteps. It is difficult to overestimate this advantage; its importance lies in the sense of power and self-reliance which this steadily-growing authority gives to a community—all its members are able to express themselves simply and naturally in the same language—for architecture is speech materialised, and we know what happened at Babel. Unfortunately it is impossible to realise the advantage at the present day—for, as a nation, we may be said to be without tradition. It has been destroyed by the archæologist, though it died hard, for tradition is wonderfully tenacious and long-lived; invasion and conquest will not kill it. Indeed, it has almost invariably happened that in such a case the tradition of the two nations coalesced at once without any break of continuity—in some cases even that of the conquered maintained its supremacy and thus avenged its inferiority in the arts of war by its superior genius for the arts of peace. It is worthy of note that the Jews, who had no genius of architecture, were apparently only employed by the Egyptians, who were masters in the art, with a tradition extending back to the beginning of time, as quarrymen and carriers of stone and makers of bricks; they were fit for nothing else and might have fared better had they been better architects. It seems, therefore, from the combination of two or more traditions, and from this alone, that a new phase of living architecture is evolved—it cannot spring, Minerva-born, from a single brain. All European architecture may be said to have had a common Roman tradition. The Romanesque, the Lombardic, the Byzantine and the Norman were moulded from this common stock into different forms by the local genius of the builders. One cannot help regretting that some one part of the Roman Empire did not adhere to the pagan religion, so that we could go to, say, Naples, and see what had resulted from that tradition being handed down, unbroken and uninfluenced, to the present day. We must turn to another form of design for a parallel. Take shipbuilding. The coasting brig which is launched from the Tyne to-day is the direct descendant of the Norse Viking ship. Its spars, its ropes and appliances are more numerous, more complicated, and, we may suppose, more efficient. That is the result of 1500 years of intelligent development, but the main structure remains the same. The lines of the bow are so unaltered that "boat-shaped" has passed into the language as a clear definition; and even a resuscitated shipbuilder of Tyre, or Sidon, might take his place in a shipbuilding yard at Gateshead and find no difficulty in joining in the work, since he would be guided by the same tradition. In England, through the Middle Ages, the differences which we notice are simply due to the greater technical skill in the later periods. By successive experiments, not always successful, the men of the fourteenth and fifteenth centuries had achieved such command over their material that they created structures which would have excited the wonder, though they followed logically from the teaching, of the men of the thirteenth century. The Renaissance changed all this; for, though it produced so fine a masterpiece as St. Paul's, it was a forced growth; the artisan was not in sympathy with it; it was an endeavour to make him speak not merely a foreign, but a dead language; it was indeed "Greek" to him; and, in the endeavour to learn it, he deadened the expressive idiom of his own vernacular speech. Yet tradition was not quite destroyed: through the reigns of Queen Anne and the earlier Georges, a village carpenter could still be trusted to express himself clearly, intelligently and with some style: there is scarcely a village which does not possess work of this period that is interesting and worthy of attention, and which, there is no reason to doubt, was thought out and done by the artisan without supervision or direction. Then came the period of revivals, as ephemeral as the religious revivals of which we hear. Now Greek, now Gothic, was extolled as the only true and authentic style; each had its votaries among the *dilettante.* Architectural design became an affair of fashions, to be put off and on like a Paris confection: an architect was expected to design, now in one style, now in another, and the bewildered artisan, robbed of all chance of expression, sank into the inarticulate drudge of to-day. Adam Bede seems to be the type of the last surviving exponent of tradition in architecture. The best hope for the future lies in the quiet, resourceful determination of architects to see to it that what they have to say shall be expressed in a simple, straightforward, forcible way, which can be easily understood and appreciated, and to go on repeating it until it has sunk deep into the minds of the artisans. There need be no fear of monotony or dulness; the thoughts may vary, though the mode of expression remains the same, and there may be plenty of interest and novelty in a story told in simple words, without recourse to extravagant language or foreign quotations. One building, which strives after skilful proportion, refinement of detail and good workmanship, may serve to leaven a whole district, and the local builders may be expected, little by little and almost unconsciously, to assimilate these qualities. Happily the reign of the archæologist is at an end. One rarely now hears the question: "What style do you call the building?" One is no longer expected to give chapter and verse for a moulding; and the use of the dentil, or dog's tooth, is no longer sufficient to stamp perfection upon the design. We are free, and if we will work with the courage and restrained individuality of the earlier men we may hope to re-establish a tradition which will be honourable to ourselves and serviceable to those who follow.
H. I.



DESIGN FOR PROPOSED NEW CHURCH AT STOKE TALMAGE. E. B. LAMB, ARCHITECT.

Stoke Talmage Church. The illustration on this page shows a proposed new church at Stoke Talmage. The design is by Mr. E. B. Lamb, and is a modified form of the design submitted by his father some forty-five years ago, when a scheme was proposed, initiated by the late Lady Frankland Russell, to pull down the present ancient brick building and rebuild.

"Parking." A system prevails in some of the chief cities of the United States, notably in Washington, of introducing a little greenery into the wider streets; it is known as "parking." Where several streets meet, or where two streets converge to a point, turf and shrubs are placed, and, if the space allows it, a strip of green is formed beside the houses; trees, too, are planted on either side of the street. The fact testifies to a curious reaction in the public mind against mere bricks and mortar, even when they assume the form of noble streets; however grand the buildings, the eye tires of perpetual walls and windows; a little concealment improves their effect, and trees, shrubs, turf, and, it may be added, birds, recall the passer-by to natural things, sweeten the air, and impart geniality and colour to the town. From Paris we hear of gardens on the roofs; this was a favourite idea of the late Sir Benjamin Richardson, and played a part in his ideal City of Hygiea. The original idea of a boulevard arose when Louis XIV. pulled down the old fortifications of Paris and removed the seat of government to Versailles: the land thus gained was laid out as a wide, gently-curving line of streets three miles in length from the Bastille to the spot where now stands the Church of the Madeleine.

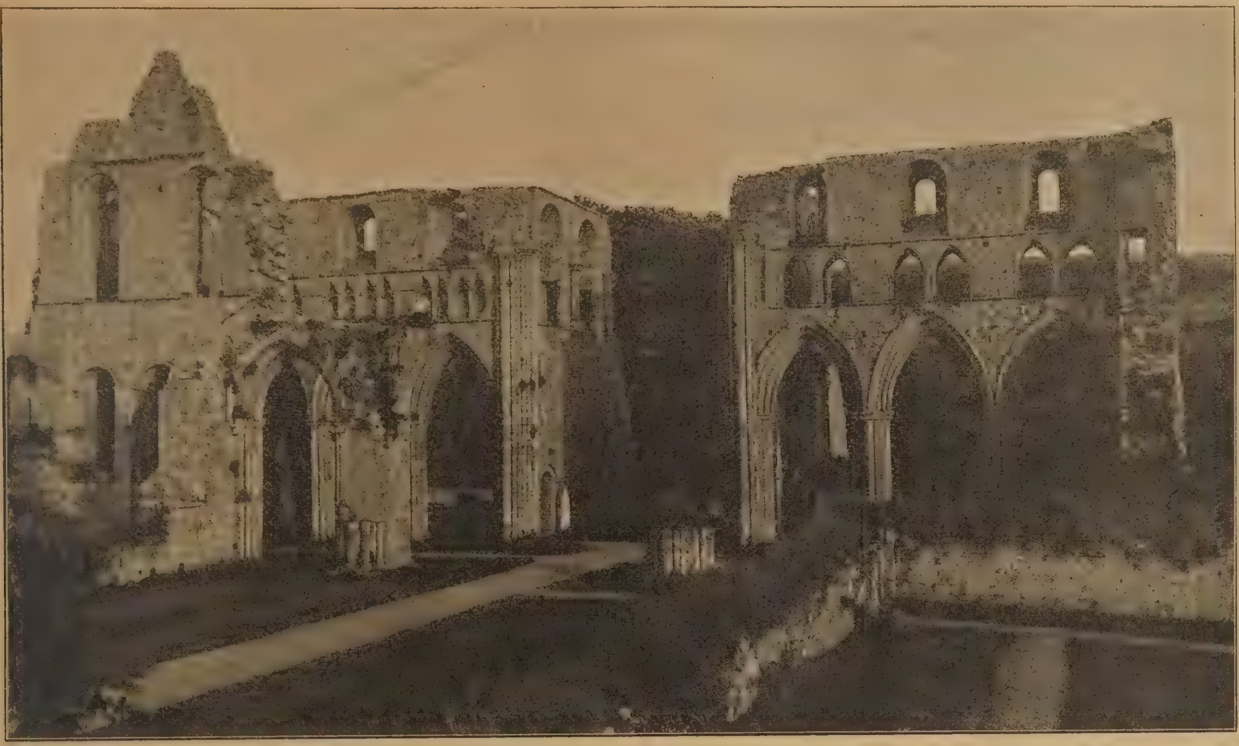
Paris remained an open town until 1840, when M. Thiers built the present walls and supplemented them by a ring of forts outside; the latter is now the accepted method of defence, and the idea has been mooted of again pulling down and levelling the *enceinte*, filling the great ditch, and building another enormous succession of boulevards. The name has, by a perversion of its meaning, been extended to almost any large street, even without trees. Nevertheless, trees large or small figure in most of the new streets in the Continental towns; sometimes, it must be admitted, they are poor specimens of their kind, weedy-looking things trying to maintain life in a desperately barren soil. Under Baron Haussmann "they ordered these things better" in Paris, and trees were transplanted to the new streets when they had attained a certain growth, together with a large quantity of their own soil, whilst no expense was spared upon new gardens. London is as yet considerably behind in street planting, but it is to be hoped that the Office of Works and the London County Council will work together to encourage it as new streets arise. In other matters than streets London is not only equal but superior to foreign capitals so far as greenery is concerned; it would be difficult to find anything as beautiful as St. James's Park abroad, and the foreigner who passed through it for the first time and continued his walk through the succession of parks to Bayswater, would be fairly astonished at the greenery of "smoky" London. The Victoria Embankment, too, is a successful instance of "parking" on a large scale, though of late years the growth of the trees seems to have been retarded by the constant burrowing of the soil by railways, sewers, and gas pipes. London air is far from unfavourable to the growth of trees, turf and ornamental shrubs, though the latter require to be carefully chosen and well looked after. In this the simplest of all methods for increasing the amenities of "town" it is too often forgotten that it is an architect's question, not merely a gardener's or a park official's. In carrying out London improvements, a number of departments, professions and trades are involved, and they seldom work harmoniously; what is needed is that the architect should harmonise the whole, so, that nature and art, buildings and verdure, fountains and sculpture should be combined in a series of pictures of which he alone can provide the frame. J. C. P.

On Reflection.

American Architects and Examinations. Architects in America as well as in this country are feeling about for a remedy against the flooding of their profession by incompetent men who mislead the public and bring discredit on the architectural profession. With this end in view, the American Institute of Architects, following in the steps of our own R.I.B.A., has decided to require candidates for admission to its ranks, after January, 1901, to pass an examination. Membership of the Institute will thus, it is hoped, in course of time be universally regarded as a guarantee of professional ability. In several States compulsory registration is in force, but the effect of this is not altogether what architects would desire; the laws, being merely local in their operation, do not give architects any status outside their own State; what they want is a kind of hall mark, the validity of which will be recognised throughout the length and breadth of the United States. Whether this desideratum will be secured by the recent decision of the A.I.A. depends upon the degree of confidence with which that institution is regarded by American architects and by the American public. In England, as we all know, there are more than one opinion about the merits of the R.I.B.A., and so it comes about that in this country there is a strong demand for legal registration as a supplement to or substitute for the diploma of the Royal Institute—the exact reverse of what is going on in America, where the demand is for the Institute diploma as a supplement to the State licence. There is at least as much need in America as in England for measures to be taken to exclude the incompetent and unqualified. It is true that in England there is nothing to prevent the auctioneer, the plumber and the ironmonger from describing themselves as architects and taking such commissions as they can get, but they do not in this country advertise their ignorance in the public prints. In America, on the other hand, it seems to be the custom for architects who want commissions to advertise for them. It is easy to imagine and to sympathise with the case of a thoroughly competent architect of practical knowledge and artistic sensibility—but lacking, perhaps, in the vulgar advertising arts which in this country we associate with the pill maker and the soap maker—who finds that while he is left in the cold the commissions of an undiscerning public are freely given to the authors of those "attractive country houses," with appalling elevations and weirdly impossible plans, which figure prominently in the advertising columns of certain American journals. If the proposed examination scheme can remedy this state of affairs, it will be a boon to architects and clients alike.

Smuggling Objects of Art. It is generally considered that smuggling is an offence belonging to the distant past; but, though, of course, it has dwindled away, it is still practised in new forms, and, shameful to say, in connection with art. There are, as everyone is aware, a large number of objects of art, antiquities, and curiosities exported from Italy yearly which are subject to taxes, some particulars of which have already appeared in former issues of this journal. As a rule, the Italian Government can be induced to allow ordinary antiquities to be exported, but it is especially vigilant over attempts to smuggle away sculptures and paintings which are subject to the tax. It has happened quite recently that three embargoes have been placed on objects purchased from abroad—one a torso bought for the Jakobsen Museum in Copenhagen, another a carved and painted sarcophagus bought surreptitiously for an American collection, and the third a bas-relief removed by stealth from a Roman church and bound for an unknown destination. This, of course, lays the students of the archæological schools, and others similarly connected, open to suspicion, and, no doubt, tends to hamper them in their work, so that the practice should be discouraged as much as possible, in order that the conscientious many may not bear the brunt of the sins of the few. It is, perhaps, peculiarly fitting to refer to this matter at a time when the proposal to start a British school at Rome is being promulgated, as smuggling of the kind referred to would be likely to prove even more deleterious to British students than it is to those of the foreign schools already represented in the old capital of the Western Empire.

Gilding: its Use and Abuse. It is an unfortunate fact, but the modern decorator abuses the art of gilding. He seems to regard it as something to be used on every possible occasion, both inside and outside the building, and the result is that the streets are full of tawdriness and rooms have a glaring and inappropriate appearance. Gold should be used sparingly and with great discretion. The very fact that an article of one material or another is gilded to make it represent something which it is not is a strong argument in its disfavour, though the employment of thin gold leaf to imitate an object made of solid gold might perhaps be less objectionable than the graining of, say, a deal door to make it look like an oaken one. But putting æsthetic principles aside for the moment, and considering the matter only from the standpoint of fitness, surely the proper application of gold leaf is a matter which seems hardly to be thought of. This abuse of gilding is perhaps carried to its greatest extent, internally, in such places as restaurants and hotels, and as these form a large item in the list of commercial buildings, the practice is the more to be condemned. It would be futile to attempt to enumerate here any rules of gilding, or to suggest what particular portions should and should not be so treated; our object is simply to point out the abuse and to try to abate it. By many mechanical so-called decorators it seems to be thought an axiom that, when the cost allows it, such parts as the caps and fluting of pillars and pilasters, cornices, &c., should in all cases be gilded, and very often one sees gold introduced largely in the wall-paper. Gold—that is, imitation gold—is not to be used haphazard and indiscriminately. For some purposes it is admirable, but they are few in number. The ordinary picture-framer encloses all his pictures in gold frames; the more capable and artistic craftsman appreciates the value of plain frames for some subjects. This serves as an example to show what is needed—a more discreet application of gold leaf. In speaking of this matter, it might be well just to refer to those external disfigurements of our architecture—the mammoth gilded letters. The offensiveness of these does not need to be pointed out to anyone possessing the least feeling for harmony or artistic effect. We do not say that they are rendered objectionable entirely by the gilding, but that this aggravates their appearance.



DUNDRENNAN ABBEY: GENERAL VIEW OF TRANSEPT WALLS, LOOKING TOWARDS CHOIR.

THE ABBEYS OF KIRKCUDBRIGHTSHIRE.*

By EDWIN FORBES.

AT no great distance from each other in and around the stewartry of Kirkcudbrightshire are scattered abbeys, keeps and castles, all in a greater or less degree of preservation or restoration, and each with an interest and style of its own.

Dundrennan Abbey.

The Abbey of Dundrennan is situated in the parish of Rerwick, about two miles from the shores of the Solway and six miles and a half south-east of the town of Kirkcudbright. It belongs to the Cistercian Order, but has hardly any history beyond what its stones can supply us with. The name of its founder even is somewhat obscure, David I. being ascribed by some, and Fergus, Lord of Galloway, by others. In any case, building seems to have been begun about the middle of the twelfth century, for we find in existing annals the fact recorded that "in 1142, one W. Brun was sent from Edinburgh to superintend the building." Other glimpses reveal particulars of the death of the first abbot in 1188; of the abbot and monks who traded with Ireland in 1280; of the sheltering of Mary, Queen of Scots, during her flight after the battle of Langside, and of her spending under the abbey's roof her last night in Scotland.

In 1605, at the death of the last abbot, the abbey was suppressed, the monks migrating to France, carrying with them the chartulary and other valuables belonging to the abbey. Tradition has it that the abbey was burned, through some charred pieces of wood having been found; but it is more probable that time and neglect brought on its ultimate ruin. For a time, till 1742, part of it was used as a parish church, but after that date it became a convenient quarry to all and sundry for building purposes.

The abbey was laid out on the normal Cistercian plan, which also applies to the abbeys of Sweetheart and Glenluce. This order never built in town, but in sheltered valleys near water. They ranked the church as first in importance amongst their buildings, and it was always dedicated to St. Mary and was characterised by extreme simplicity. The choir was invariably short, seldom more than two bays in length, reckoning from the crossing. The crossing was covered by a low square tower or lantern carried over the intersection and finished with a gabled or saddle-back roof, as may be seen at Sweetheart; the transepts had eastern aisles divided for chapels. Decoration was manifestly discouraged by this order in those early days of rigorous discipline, whitewash apparently being the only permissible medium. But let us enter the precincts of Dundrennan and see in its remains a further illustration of the Cistercian plan.

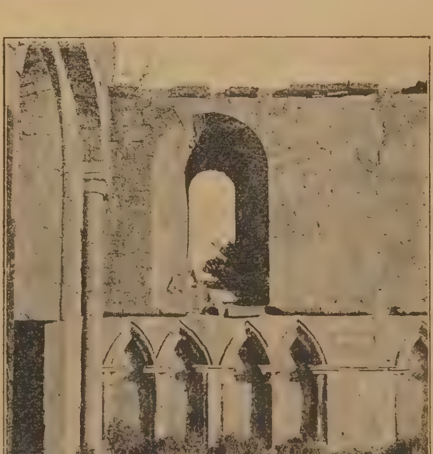
The conventual buildings formed three sides of the square or cloisters, the church forming the fourth, and the whole being connected with a pentise or covered walk.

We enter the south transept, where a modern doorway leads to what is thought to have been a mortuary chamber, which again communicated with the cloisters on the west, while on the east was the slyp. Next comes the chapter house, the remains of which show that the roof was supported by six pillars. The carving in the windows is composed of incised crosses formed by conventional lilies and Scotch thistles. The caps and bases resemble the Early English, while the Norman nail-head toothing is everywhere employed.

Over the chapter house was the scriptorium or library, of which alone remains part of two of the windows.

South of the chapter house was the refectory, with the dorter, or dormitory, over it. It was 27ft. wide and probably three or four times as long. The vaulting was supported by a single row of plain octagonal pillars; part of one is still standing. Opening from the refectory on the east side are presumably the remains of a lavatory, and still farther east the remains of the abbot's lodging. On the south side are small enclosures, or office-houses, connected with the kitchen on the one side and with the cloisters on the other. The cloister-garth formed a square of 104ft., and in the south-west corner is a door which led to the locutorium or monks' parlour. To the west of the cloister court are six barrel-shaped vaults of unequal size, used as storehouses, while over these would be the strangers' dormitory.

Monuments abound in this abbey, amongst the most interesting being the abbot's, the cellarer's, the nun's, the prior's, and that of the Belted Knight. Those of the abbot and the cellarer were removed in 1888 from the chapter house to the west end of the nave. The abbot's stone shows in bas-relief the figure of an abbot clad in travelling dress, with cowl and hood. The head is uncovered, showing the hair at the sides and a tuft in front, and the right hand rests upon the heart; above it may he seen the hilt and cross-hand guard of a dagger, the hilt being uppermost. The left hand lies open on the pastoral staff, which rests on the left shoulder and passes diagonally along the whole length of the body. The crook of the staff is turned inwards, denoting—not in later times, however—that the abbot had jurisdiction only in the abbey. In the upper corner is a six-petalled flower, intended, evidently, for a rose. The abbot stands on a



DETAIL OF TRANSEPT WALL, DUNDRENNAN ABBEY.

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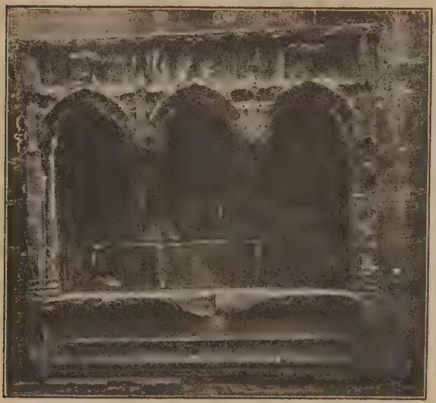
* A paper read before the Edinburgh Architectural Association; Edinburgh Architectural Society; Glasgow Philosophical Society, Architectural Section; and Perth Architectural Society, during session 1898-99.



SEDILIA, LINCLUDEN COLLEGE.

human figure recumbent and clad in the garb of "Old Gaul." (There is a figure similar in every respect in the nave of Paisley Abbey.) The legs and feet of the figure hang over the side of the stone and from a deep gash under the ribs on the right side the bowels protrude. The left arm grasps the right foot of the abbot, and the head is inclined upwards and is pierced by the abbot's staff. The stone bears no date, but on another, dated 1489, there are the same six-petalled flowers, suggesting the possibility that both stones are the work of the same sculptor.

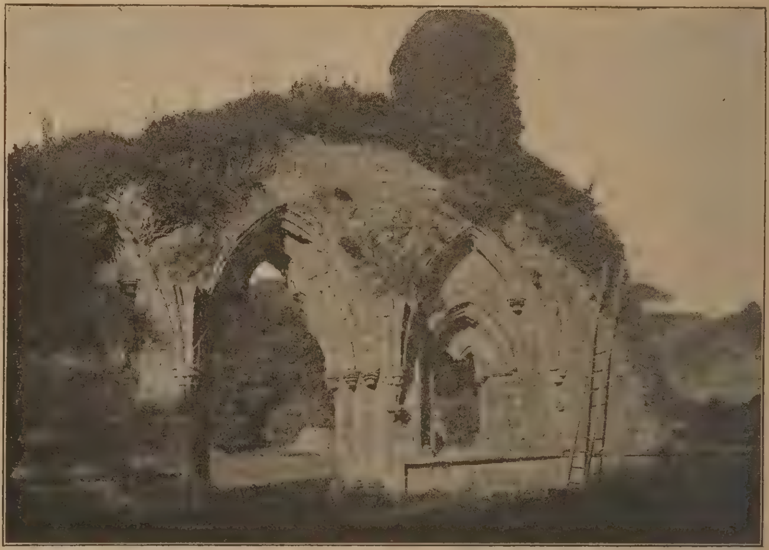
The nun's stone represents a young woman clad in a long dress gathered at the waist by a belt. Over this is a mantle reaching to the knees, a wimple enfolds the neck, and the veil is thrown back. The hands are crossed over the breast and the feet rest upon dogs couchant gardant, turned tail to tail. The inscription is badly cut and spaced, but seems to read thus: "Here rests in Jesus, Sybil, at one time Lady of Prichy, who died in the year of our Lord 1440." As to how this lady came to be buried in a Cistercian monastery, history is silent. Different theories have been propounded, one that this is the last prioress of Lincluden, who, on her expulsion from that convent by Archibald Earl Douglas, took refuge in Dundrennan, died, and was buried there. But while we know that the Pope had acquiesced in the expulsion of the nuns from Lincluden, we can hardly suppose that he would sanction the admission of one of them to this other monastic institution.

Glenluce Abbey.

We now move across country to Glenluce, another example of the Cistercian Order. This abbey is beautifully situated on the river Luce, one mile and a half north of Glenluce. It was founded in 1190 by Roland of Galloway, Constable of Scotland, and one of a family which made itself famous by the founding of such institutions. Fergus, Roland's grandfather, was himself the founder of three monasteries of the Premonstratensian Order. The remains of the church are most likely those of the original building, finished before 1240; these remains, and other fragments, point to Early English of the best period. The east end of the cloister-garth must have been rebuilt about the end of the fifteenth century, and the chapter house evidently belongs to this later period.

The general plan is very similar to Dundrennan and Sweetheart; the three coincide in almost every point. The Ayrshire and Galloway Archæological Society is at present engaged in clearing out the fallen *débris*, and when this is finished it will be possible to restore the plan which at present is buried.

The chapels of the transepts have been vaulted, but the few corbels rather suggest a wooden roof throughout the rest of the building. A singular feature is a circular stair partially corbelled into the south transept and rising above the apex of the gable, where it doubtless terminated in a conical-roofed turret, referred to by Symson, in 1684, as a steeple. Off this transept were the sacristry and slyp, both still obliterated by rubbish. The chapter house is 24ft. square and has a centre column.



DUNDRENNAN ABBEY: VIEW OF CHAPTER HOUSE LOOKING FROM CHAPTER HOUSE TO CLOISTER GARTH.

The vaulting is quadripartite, the ribs resting on the central column and on the corbels on the wall. The bosses at the intersections in the two easternmost compartments bear shields having coats of arms, one being the arms of Scotland, the other the crowned lion of the Province of Galloway.

The other intersections bear foliated and grotesque works of a very spirited description. There is no trace of a door having been hung in the slightly pointed doorway. Above the chapter house would probably be the scriptorium, the tiled floor and fireplace of which were partially exposed in 1884.

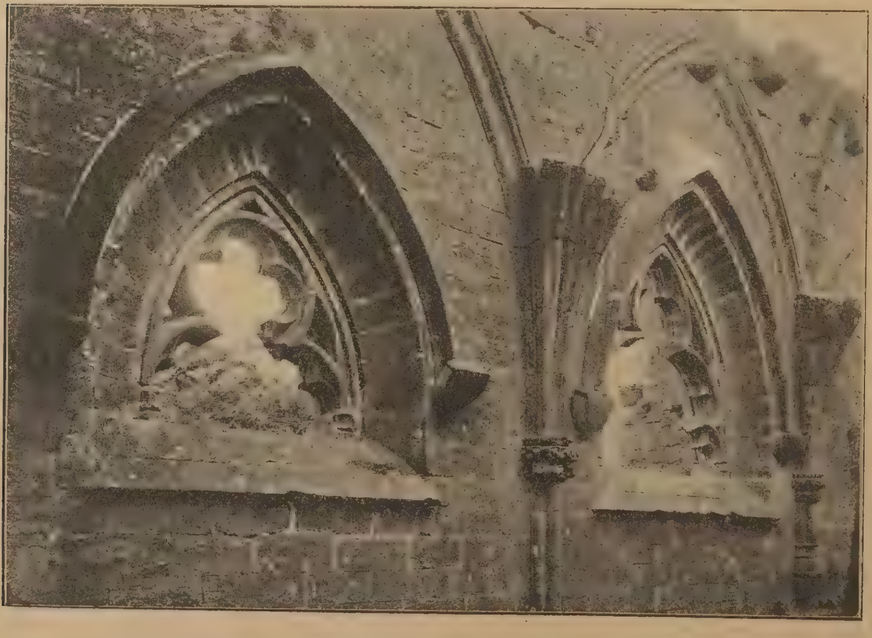
Sweetheart Abbey.

In the picturesque village of New Abbey, at the end of its one long, straggling, white-washed street, stand the ruins of Sweetheart, the last of this trio of Cistercians and a charming example of bold Scottish Gothic, worthy of minute study. More extensive and complete than those already described, the remains of Sweetheart speak for themselves and need few words to describe them. We are all familiar with the picture which history has preserved to us, and which even to-day gives a touch of romance to its stones—how Devergilla, wife of John Baliol, after carrying about with her in a casket the heart of her husband, built this house beautiful to his memory and laid his heart to rest within its walls, calling it as she did so, "Dulce Cors." Even the abbots shared in this mellifluent title, and bore the name of Dominus Dulcis. There is little in the subsequent history of the abbey worth recording, but we learn that it was struck by lightning and considerably injured about 1370.

Lincluden College.

A walk of a few miles along the banks of the Nith brings us to that most interesting building, Lincluden College. This college, or provestry, is situated near the confluence of the Cluden with the Nith, about one mile from Dumfries, and was originally a convent for Benedictine nuns. It was founded in the reign of Malcolm I., by Uchtred, son of Fergus, Lord of Galloway, who endowed it with considerable territorial possessions in the neighbourhood. We read that in 1296 Alianne, the prioress, swore fealty to Edward I. at Berwick and was confirmed by him in her dignity, but one century later we find the nuns expelled by Archibald the Grim, Earl of Douglas, and an ecclesiastical college founded in its stead.

Originally it comprised a group of buildings



WINDOWS IN NORTH WALL OF CHOIR, LINCLUDEN COLLEGE.

which enclosed a spacious court, the east side of which was occupied by the provost's residence, the south side by the church, the north by a refectory and dormitory, while the west was formed by a wall with entrance gate.

The collegiate church, which stands on the site of the original church, is one of the earliest of the Revival period. It embraces the chancel, the south transept, a transeptal chapel, the south aisle and the sacristy. The two vaulted chambers north of the sacristy also belong to this period.

This church, like the abbey which preceded it, is of small extent, but it stands out unsurpassed by any of its class for the boldness, richness and purity of its architecture. Externally, the noticeable features of the building are the projecting buttresses rising to the height of the side walls, unbroken by any intake, the large double base extending round the walls, the cornice decorated with richly-carved foliage, and the well-proportioned pointed windows enclosed in peculiar and very bold hood mouldings and originally divided by mullions, with rich geometrical tracery inclining to leaf and flame forms.

Internally, the beautiful proportion of the church is impressive. The side chapel and the aisles have been roofed over at a uniform height with groined and ribbed vaulting. There was an apartment over the chapel, probably a domus inclusi, lighted by a small two-light window and approached by a newel stair within a projection at the angle formed by the chapel and chancel. The vaulting to this chapel has been constructed of rag-work—that is, small, flat bedded stones, from ½in. to 3in. in thickness, entirely unhewn and set in a thick bed of mortar.

Separating the nave from the chancel is the rood screen in stone and over it the rood loft and chancel arch. This latter is segmentally pointed and the imposts are shafted with floreated capitals.

On entering the chancel, the eastern window is seen to occupy nearly the whole width of the wall and upwards to the vaulting. Below it are the corbels which supported the slab of the high altar, and on its sill is a small carved bracket. In the south wall are a triple sedilia and a piscina, opposite to which is the tomb of Margaret, Countess of Douglas, eldest daughter of King Robert III. These are all of the most beautiful design and workmanship and very similar in detail.

The chancel was roofed by groined and ribbed vaulting in three divisions; the vaulting shafts and parts of the ribs are still on the walls. Over the vaulting of the chancel, as in the case of the transeptal chapel, there was an apartment roofed by plain stone vaulting, with large chamfered transverse ribs; the bottoms of these latter alone remain. The sacristy is on the north and the provost's lodging extended north from it. The basement of the latter consists of five vaulted cellars; the first floor appears to have contained a square apartment at the north end and the remainder of this floor probably formed the great hall extending over the sacristy. The north part was carried up as a square tower terminated by crow-stepped gables. The entrance door opened upon the octagonal staircase, and the stair, which gave access to the several floors and which seems to have been quite a feature, fell in 1851. We learn that mass was performed on Christmas Eve, 1585, in this ancient fane with unusual pomp and splendour, but since then it has neither been said nor sung in the House of Uchtred.

Cærlaverock Castle.

Far from the busy haunts of men this castle is most romantically situated on the shores of the Solway, ten miles south of Dumfries. It is triangular on plan with double towers over its entrance, while the other angles are terminated by single circular towers. The castle in its present state is the work of six distinct periods, the last of which is by far the most interesting and includes two of the elevations to the inner courtyard, which was built about 1630 in the Renaissance style. To quote from Messrs. MacGibbon and Ross, the grouping and design is such as entitles it to rank as one of the finest and richest specimens of Early Renaissance in Scotland.

Such is a brief *résumé* of the chief ancient buildings in and about the stewartry of Kirkcudbrightshire, which, in addition to their own peculiar and intristic interest, are situated in a country which is both romantic and beautiful and lends to them that charm and beauty distinctly and irrevocably associated with Nature.

CHURCH ARCHITECTURE:

WHAT IT IS AND WHAT IT MIGHT BE.

By L. RYCROFT OAKES.

THERE is a nameless feeling which creeps into the spirit and seems to freeze the blood as it courses through our veins when we stand under the shadow of a glorious church—a building erected as a labour of love to the glory of God in the Highest. Ruskin says: "The greatest glory of a building is not in its stones, nor in its gold; its glory is in its age. . . . It is in that golden stain of time that we are to look for the real light, colour and preciousness of Architecture." But is this correct? Will all our modern churches and villas, when their walls have been "encrusted with fame and hallowed by the deeds of men"—will *they* impart this strange, nameless feeling? Years hence, will our descendants look upon these modern creations which serve as churches and say they were the works of men struggling after a nobler and higher life, that they were materialised prayers to God himself?

PART OF SOUTH WALL OF CHOIR, LINCLUDEN COLLEGE.

No! even when Nature has laid her kindly hand on these harsh, unspeaking stones when the hungry moss and lichen have added yet another tinge to these barren walls, they will remain unchanged, save as a record of a past generation. What then is this charm—apart from age—which pervades these buildings of our forefathers? It is the indescribable passion which they engrafted into the smallest detail, into every length of moulding, every piece of stone or wood. The insignificance of the part mattered not to them; it was a labour unto God—and a gift. Each man felt that he had imparted to the stones an individuality which was his own and could single out, from some part of the building, work which was an incrustation of his feelings. No wonder then our modern buildings are so lifeless, with mouldings and ornament worked by unsympathetic masons, who neither understand what they work nor care what they are working for. No wonder the Art-loving public treat Architecture with indifference and contempt. And yet we complain and wonder why the "man in the street" does not interest himself in these *our* productions. The battle of the styles is a thing of the past, but its effect is still seen in our churches. Speak to an architect concerning a church and his mind turns instantly to a Gothic building, or something akin. It is impossible for him to dispense with pointed arches, crockets and pinnacles—they fall from his pencil unconsciously, almost irresistibly; he runs in a groove from which he never attempts to extricate himself. Certainly we are occasionally greeted with pleasant surprises of originality which are, to some extent, effective, but, the spirit being wanting, there all things end.

We go on improving and re-arranging the styles in a very clever manner, no doubt, but we do it as a matter of necessity, thinking probably that we are treading in the footsteps of a by-gone generation. But no! they were craftsmen who have left no successors. We must therefore *create* if we wish to be as they, to be artists on an equality with the painter and sculptor.

One of our greatest architects says, "It is not by imitating the works of the old masters or *improving* them, nor by analysing their principles of design, that we shall equal or surpass them, but it is by drinking at the same fount, drawing our inspiration from the same source, continuing the paths which they began." This, then, is the precept we must follow. We may ask, what was their fount? Was it the works of their forefathers, or measuring and copying the works of their ancestors?

No! Nature was the fount from which they drank; Nature the source of their inspiration; the birds, the fishes, the woodlands and mountains the springs from which their creations emanated. Theirs were the creations of men of a different age and different morals. The quiet, uneventful monastery life, the wandering of the masons from town to town and village to village, cannot be compared to the wear and tear system of this nineteenth century. We see things in a new light and under altered circumstances. In the push and scramble for existence men's natures naturally change, they become hard and barren, the creative element is choked. As a relief, they fly to antiquity with note book and two-foot rule and there copy precisely and accurately the mouldings and ornaments.

I do not advocate a disrespect for old work, far from it, but the continual copying of its detail turns us into mere machines; we simply delineate with our pencil that which has become a constant habit to our hand and form to our eye. We are no more artists than the labourers are craftsmen. If architects would only go to Nature and there study and translate it for themselves, and would endeavour to create among artizans an interest in their buildings, visiting the works more as leaders and directors than as fault finders, what a change there would be in ecclesiastical work!

Many will raise the question, What do we gain by going to Nature? What are the great lessons we should learn or principles we should discover? The answer is "all things," and perhaps the foremost of all "construction." What triumphs of engineering are to be found among Nature's works; what perfection in balance, stress and equilibrium! Everything is calculated to a wonderful degree. There are lessons for the greatest engineer, let alone the greatest architect. Simplicity is a feature that strikes us when viewing her marvellous works; all her laws are founded on the most elementary basis; there is nothing indirect in her methods; her naïve, unaffected simplicity and her minute adjustment of quantity are an example to all. Seldom do we see anything superfluous; if this exists its life is but of short duration and excess of growth is either choked or killed by others. Every branch and stem, every leaf and flower, have a part to fulfil, there are no *extra* leaves for ornamental purposes; everything is perfect, and, if robbed of that perfectness, suffers to a certain extent, either more or less. It is this "so much and no more," this knowing when to stop, that teaches us such a grand lesson in ornamentation. The overcrowding and cramming of every available space on a building with mechanical carving and moulding fills one with satiety and weariness; even beautiful, glorious sunshine would become to us monotonous if it were not for the shadows thrown from passing clouds and the shades of evening and of night.

Truth is always manifest; Nature never lies. This great fact becomes evident at first sight and so forcible is it at times that it would impress the most cloudy and unobservant mind.

It is here in these woodlands and meadows, these fairy gardens, that exquisite forms are so apparent. What mouldings flit through our imagination as we sit on the bank of some rushing stream and watch the grace of lines in the swirl of the water. Thousands upon thousands of the most delicate and varied contours abound here; all is full of harmonious lines, from the beautiful sweep of the swallow as it skims through the air to the tender and delicate curve of the reed, bent in the wind. It is here that we find the bold effects of light and shade and the majestic grouping of members. Nowhere is beauty so abundant, nowhere are suggestions so freely given; and yet we pass through it sometimes, almost daily, and never see or think of these, God's greatest gift to man.

Then comes that last and perhaps most captivating of all lessons—colour. Even those who are blind and insensible to most of its beauties will occasionally be struck by its glorious tints. Nobody who sees the dying glow of sunset can turn away without being subdued, for a moment at least, by its superb and solemn grandeur. Nightfall, with its saffrons and pale greens, morning, with its dew and aromatic freshness, are equally beautiful. This constant change gives us endless opportunities for studying colour to its widest extent. The tidal flow of the vast ocean, with its variegated greens and patches of white foam, form in the imagination the grandest mosaic pavements. And the glories of stained glass are revealed from the fringe of the wood as the sun sets behind the low range of hills. The greatest painters of every school obtained from nature the secret of those marvellous tones. Can we therefore disparage it when greater men than we have set the example?

This question of painters and colours brings to our mind another weak spot in ecclesiastical work, namely, the use of frescoes. How seldom in this country, when Art has reached a perfection never before attained in England, do we see a church the walls of which are adorned with frescoes by any great painter. The money spent on insignificant mouldings and decoration would, in many cases, furnish the interior with a range of good frescoes. But it is not always for the want of money that this dearth occurs. We architects alienate ourselves from our brother artists and desire to be the designers of all things. It is not suggested that the painter should be allowed a free hand to decorate the building as he chooses. The architect must be the director, the painter the executor and artist.

But we seem to prefer to leave out this beautiful jewel rather than to see another name coupled with our own. If this is the truth, then we are in a sad state, indeed. When Art has attained such a degree of excellence, can we architects stand sullenly aloof? Can we stand afar off and let these men pass from our midst? Men whose equal we may never again see; men whose works may carry the weary to a shining far-off shore and give to them for a brief space a glimpse of the land beyond. And most of these are men among us to-day—some are at rest in a brighter world—and yet we scorn or refuse their aid; we refuse that which would be our greatest comfort and that which would most forcibly appeal to the public mind.

Many of us know Mr. H. Wilson's description of an ideal church. For those who do not, it will bear repetition. He says: "Picture for yourself a mere barn boldly buttressed, showing high above the roofs of some town, or set among the hills and rising from them sheer and rugged as a cliff, entered not too suddenly by a pillared porch arched over with a mosaic vault, where the prisoned sunlight glows even on gloomy days. Through a door covered with story or device in beaten metal, you step into a solemn and simple hall—a nave it may be—with walls recessed to give shadow and surface change, the windows few and lofty, mere holes, through which the light, attempered and made more mystical by pale figures in the glazing, opaline in colour, like crystal for clearness, floats down upon the floor and floods the walls with a tender brightness. On the upper surfaces of the walls Burne-Jones should spread a range of mosaics or frescoes, like a skin stretching round the piers and arches, over soffites, and into the window recesses. The eye in its wanderings should suffer no check, but be led insensibly by imperceptible transitions to the very focus of the building. The end walls should be frescoed by Watts, and beneath the frescoes, and continued round the whole building, should be a broad dado of marble sheeting or rich plain colour. The floor should be a chequered sea of sombre-tinted stone, the roof a crossing maze of timbers quaintly coloured and enlivened by gold. What a hall for music might be here, or what a church! If the latter, imagine the sudden rise of steps at the choir level, like a wave in the sea of stone, bearing noble stall work on its breast; then the further lift at the altar level supporting the reredos or baldachin, glowing with colour like an altar fire. The altar itself, a piece of solemn sculpture, or a master work wrought with all the resources of the modern goldsmith's art, set with enamel and fine relief in beaten silver. The lamps, the chandelier and coronæ, the brazen gates, the chalices and censers, the patens and the salvers of shining silver enriched with reverent fancies and dedicated skill."

What a beautiful dream this is! What a calm, peaceful grandeur would reign in such a church! A church where the weary soul would find rest from the jarring world without; where the "fool who came to scoff, remains to pray." Truly, such a church would be a "joy and a blessing ever to pass near," and would "bring the light into our eyes to see from afar, lifting its fair height above the purple crowd of humble roofs."

And why is this all a dream? Because we stand aloof from our brother artists; we disregard Nature and her laws and slavishly copy the works of a by-gone generation. We might overcome these things if we would, but a conservative blood runs in our veins. We were taught by great men who instilled into us the principles of Gothic Architecture and whose teaching we cannot thus throw lightly aside. It is to the coming generation then that we must turn our attention. Show them the folly of copyism and alienation from their great supporters. Teach them to go to Nature, not solely as a matter of necessity and toil, but as a labour of love. Then will they become conscious of her great power and beauty; then shall we have churches worthy of the name and worthy of Him to whose everlasting glory and majesty they are dedicated.

New Board Schools at Weston-super-Mare have been built in the Locking Road. The site has cost £2,032, the building £4,565, the furniture £300, and the heating apparatus £307. There is a large central hall surrounded by seven classrooms, five of which are seated for sixty children each, and the other two for fifty each, 400 in all.

An Exhibition of Religious Art, otherwise known as the "Exposition Durendal," is now open at the Musée Moderne at Brussels. Mr. Walter Crane, Miss Catherine Weeks, Miss Newell and Miss Morris (of Hammersmith) are among the English exhibitors. The exhibition will remain open until January 25th.

An Aberdeen Councillor as Art Critic, —In a discussion at a recent meeting of the Aberdeen Town Council upon the advisibility of taking over the Art Gallery and Museum it was pointed out that unless the Corporation allowed a charge to be made for admittance to the artists' exhibitions these could not be held there. Councillor Gray, in opposing the making of a charge for admittance, expressed his opinion that the artists' exhibitions were very often rubbishy. The Lord Provost said the artists' exhibitions were not only a great treat to the citizens—they were not rubbishy—but they helped to develop the artistic student. Aberdeen had produced a great many good artists, and they should not desire to check them.

Views and Reviews.

CELEBRITIES AND OTHERS.

This compilation is so well known that it will be unnecessary to mention its advantages further than to say that it is absolutely necessary to anyone wishing to keep up-to-date in all information with regard to persons of eminence. Although this is the fifty-second year of its publication, it shows not the slightest falling-off in supplying information of the most recent occurrence. The book becomes larger year by year, yet is not unwieldy—in fact, it is a pleasure to handle, so neatly is it bound and printed. In this number several of the tables have been left out thus greatly facilitating the quick finding of information, and occurrences up to October 31st have been recorded. The lists dealing with the Press are about the only things not to be relied upon; the list of societies might be added to, and particulars of their chief officers given. We cannot praise too highly the get-up of the book—the binding is most neat, and the paper exceptionally good, considering the cost.

"Who's Who, 1900? An Annual Biographical Dictionary." Fifty-second year of publication. London Adam and Charles Black, Soho Square.

"AS OLD AS ADAM"—

It may be, but if so we pity Adam. If he had to suffer the contemplation of a system as intricate and wonderful as this without the aid of this lucid treatise, no wonder need be expressed at his fall. But we are happily in a position to enjoy the system with the aid of this book. We must really congratulate the author on his dry, though unintentional, humour. We were under the impression that the exponents of this science of geometrical figures who claim religious derivation and symbolism for these figures had been overcome by the ridicule lavished upon them, and it is with much pleasure we find this is not so, and that the humour of it is not lost to us yet.

In introducing the subject the author presses on us the remark that "measurement by angle is peculiarly adapted for establishing a relationship between bodies varying much in size and in distance from each other, for the angle remains the same, as measured by degrees, whether the lines containing it be inches or leagues in length." And we would remark in return that by dividing the "Heaven-circle" (*sic*) into eight or twelve equal parts he can distort almost any shaped figure into coinciding with some part of these divisions, and still retaining some semblance to its former self. It is in this way that the Cadmean alphabet is made to appear derived from geometric forms. But we are not confined to the circle; the square, the rectilineal triangle, and lozenge composed of two equilateral triangles are all brought into service, and an attempt is made to show that they bear some relation to each other.

The author has not kept to any restricted range of examples in support of his arguments, but instances the game of chess (by the way, he does not forget to refer, in this connection, to a circular—or shall we say "heavenly"—chess-board he has registered at the Patent Office), the game of draughts, the clock dial, the mariners' compass, playing-cards, and—we are patriotically grateful for it—the Union Jack. Those who delight in the symbolical and the mystical will no doubt find pleasure in this curious pamphlet, and others may—as we have suggested—find its perusal not altogether unamusing.

"As Old as Adam; or, First Principles in Religious Geometrical Symbols and Alphabetical Characters," by Joseph Houghton Spencer, architect. London: James Nisbet and Co., Ltd., 21, Berners-street, W. Price, 1s.

THE STRENGTH OF MATERIALS.

Without the least atttempt to startle the world with new theories or methods for the determination of stresses, Professor Ewing has in this book collected together, systematically arranged and clearly expounded a series of statical facts of the highest importance. It is not too much to say that, in spite of its comparatively small bulk, it is the best and most exhaustive work on the subject which has yet appeared in English, the most learned, the most comprehensive and the most intelligible. At the same time, though readily comprehensible by anyone acquainted with the elementary statical laws and accustomed to algebraical and trigonometrical equations, it is hardly the book for a beginner, and it is quite possible that even more advanced readers might at first be confused by the use of unaccustomed terms, what is generally known as *The* Modulus of Rupture being called Young's Modulus, for instance (because there are in reality three different moduli of rupture); and a beam fixed at both ends being known as an "encastré beam." But these things would only confuse momentarily, and to set against them there is a general excellence which is highly laudable. In fact, the excellence is so general throughout that it is difficult in the extreme to select any portions for special mention in a necessarily short review. At the very commencement the relationships between stress and strain are set forth with a clearness never hitherto approached; and so, later on, is the determination of the stresses in framed structures by the "Method of Sections," and in certain specially difficult cases of roofs by means of the stress diagram; and so on, point by point, until the book closes with the consideration of hanging chains and arched ribs.

A.

"The Strength of Materials." By J. A. Ewing, M.A., B.Sc., &c. University Press, Cambridge. Price, 12s.

GEORGE HERBERT, ILLUSTRATED.

Those who know the charm of quaint old George Herbert may be glad to have their attention called to a very interesting illustrated edition of his poems, which Messrs. Seeley have just issued; and those who do not could hardly find a better means for becoming acquainted with his piety and wit and wisdom than this dainty volume affords. It was a happy idea to present Herbert's sacred poems in conjunction with reproductions of old engravings which the poet is quite likely to have seen, and which may in some cases have suggested the poems themselves. The anonymous compiler has shown great ingenuity in finding illustrations—generally by no means inapt—for so large a number of verses. A considerable proportion of the engravings reproduced are by Albert Dürer, and one realises when the works of the artist and the poet are regarded side by side some striking resemblances between them. Strength, directness, simplicity, and a homely familiarity, which is only saved from being irreverent by the intensity of the religious feeling underlying it, are equally characteristic of the poems and the pictures. One small criticism we have to make of this otherwise admirable volume; the illustrations are inserted without title or artist's name, and to find these particulars one has to turn to the list of illustrations at the beginning of the book; this is a rather exasperating arrangement, as the special value of this edition lies in its curious illustrations, and the reader naturally wishes to be informed as to their source.

"The Temple": Sacred poems by George Herbert, with engravings after old masters. London: Seeley and Co., Ltd. 3s. 6d.

THE LIABILITIES OF THE SURVEYOR.

In these days of many by-laws and regulations it behoves all to become acquainted with the liabilities to which they are exposed in connection with their business or profession, and it is, unfortunately, in the records of the law-courts that these liabilities most prominently and constantly come before our eyes. In the hand-book under review it is the liabilities of the road and highway surveyor that are dealt with. It is now well established that an action will not lie against a road authority for personal injury sustained by an accident due to the mere non-repair of a highway, but in case of misfeasance, or wrong performance, they are liable for the negligence of their servants. This is illustrated by the case of Foreman v. Canterbury Corporation (L.R., 6 Q.B., 214), where a heap of stones was left by the side of a road without a light, and the plaintiff on a dark night drove his cart against it and was upset and injured. The obstacle had been left on the road by the negligence of the persons employed by the Corporation to repair the roads, and it was held that the Corporation were liable. There are five parts to the book, namely:—(1) Accidents on highways and the liability of highway authorities and others in connection therewith; (2) encroachment on and obstruction of highways, and the rights and liabilities of adjoining owners; (3) extraordinary traffic; (4) the maintenance, repair, and improvement of streets, roads, and bridges, and the rights, duties, and liabilities of highway authorities; (5) private street works and the laying out of new streets. The original notes (in "The Surveyor and Municipal and County Engineer") have in every case been thoroughly revised, and in many cases almost entirely re-written, and the result is a reference book which should be especially useful to the road surveyor.

"A Hand-Book of Highway Cases." Edited by J. B. Reignier Conder. London: St. Bride's Press, Ltd. 2s. 6d., nett.

ENGINEERING TABLES AND RULES.

The thirteenth annual issue of this little compilation consists of 25,000 copies, and is larger than any of the former editions. There are a great many books of tables and formulæ at the service of the engineer and architect, but this one is especially useful on account of its portability and the concise manner in which all the information is given; besides which it is well printed on fairly-good paper. Mr. Frederick Grover, A.M.I.C.E., M.I.M.E., has written a chapter on gas engines, and we note that under the section dealing with boiler chimneys it is stated that where four tons of coal are burnt per week of fifty-six hours a fair height for the chimney would be 75ft.; for 50 tons, 140ft.; for 100 tons, 180ft.; and for 150 tons and more, 200ft. A round chimney is better than a square one, and the area of the foundation should be such that the pressure on the firm earth does not exceed one ton per square foot. Some interesting figures are given by Mr. W. H. Atherton, B.Sc., under "Beams and Girders," and this chapter concludes with a lucid summary of operations in designing a beam. There is given on page 226 a very useful table of particulars and efficiencies of the electric crane, which has come greatly into vogue during recent years, and has proved to be more compact and convenient than any other. An electric crane weighing 24 tons, and having a span of 45ft., will lift 30 tons at the rate of 2·4ft. per minute, fully loaded; it will travel, fully loaded, at the rate of 41ft. per minute, and its traversing speed for the same time and under the same conditions is 20ft. Its hoisting efficiency at full load is 54·3 per cent. The diary has more than doubled in size since the first number appeared, and, supplemented as it is with numerous diagrams, is a decidedly handy and cheap production.

"The 'Mechanical World' Pocket Diary and Year Book for 1900." Manchester: Emmott and Co., Ltd. Price, 6d.

EXCAVATIONS IN OXFORD.

This pamphlet is an account of the excavations undertaken by the Oxford Architectural and Historical Society during August and September this year. These excavations are important, apart from the discoveries made, on account of their being the first systematic work of the kind which has been taken in hand at Oxford at any rate during this century, and most probably for a hundred years or more before. The committee entrusted with the work, as originally formed, consisted of Mr. Madan, president of the Society, Mr. James Parker and Mr. Herbert Hurst. With these were associated two volunteers, Mr. W. Mansell Merry, M.A., vicar of St. Michael's, who is responsible for the excellent photographs illustrating the pamphlet, and Mr. Fraser H. Penny, M.A., the writer of the pamphlet. The object of the excavations was to trace the course of the old city wall through the seventy or eighty yards space between the south wall of the Sheldonian Theatre (up to which the city wall can be traced with tolerable accuracy) and what was a Lady Chapel standing near Smith Gate, or, what is now, the corner of New College Lane, close to which it reappears. The result of the work was to find the remains of two city walls and to develop the bastion, apparently built against a wall running almost diagonally across the Quad. This wall, trending N.E. towards the Lady Chapel, was from 6ft. to 7ft. 8in. thick; the walls of the bastion were 5ft. thick and on each side there was a room, exterior to the city, and probably of later date than the bastion itself, which might be placed in Henry the Third's time. In the S.W. corner of the Quad, and east of this bastion, there were many mains of foundations of houses, and the original wall had been robbed of its stones to be used for other purposes and thinned down in many places. Another portion of a wall worked upon large stones, laid in a herring-bone fashion, was found commencing south of the main wall at a short distance from the east flank of the bastion; it runs in an easterly direction, almost in the direction of Hertford College, leaving little doubt that there is on this spot a double wall to the city. Besides clearing up the course of the city wall, the excavations were rich in discoveries of objects of minor interest. It is a pleasure to see the interest taken in their city by the members of this Society, and they are fortunate in having one who can record their proceedings in an attractive and readable manner.

"Buried Oxford Unearthed; Being Some Account of the Excavations Undertaken by the Oxford Architectural and Historical Society during August and September, 1899." By Fraser H. Penny, M.A. James Parker and Co., 27, Bond Street, Oxford, and 6, Southampton Street, Strand, London.

MODERN FARM BUILDINGS.

We are pleased to see that the demand for this excellent little book has made it imperative for the publishers to bring out another edition. Mr. Clarke knows about all there is worth knowing about farm buildings, and it is of inestimable service to have his experience set out in such a clear manner. To the land agent, surveyor, or architect engaged in such work, the book is a necessity. The great merit of the book lies in its strict attention to economy in building; in view of the keen foreign competition which English farmers and stock-keepers have to fight against, expensive additions or improvements to farm buildings are very seldom possible. The plans throughout the book are most clear and admirable—every detail seems to have been considered. This third edition has given the author opportunity to introduce information upon several matters which have recently engaged considerable attention. The various points in connection with the need for greater sanitary precautions being taken against the speading of tuberculosis and other diseases by the improved construction and management of cow-houses have been considered, and a reprint is given in an appendix of the "Model Regulations: Dairies, Cowsheds, and Milk Shops," recently issued by the Local Government Board for the guidance of local authorities. Chapters have been added on cottages, homesteads for small holdings, and iron and wood roofs, with a comparison of their cost and respective advantages for farming purposes; a short chapter on the subject of repairs and materials will also no doubt be much appreciated.

"Modern Farm Buildings: their Construction and Arrangement." By A Dudley Clark, F.S.I. Third edition. Price 6s. London: B. T. Batsford, 94, High Holborn, W.C.

Keystones.

A new Constitutional Club at Loughborough has been erected from the designs of Mr. W. T. Hampton.

Wrexham Church Restoration Fund has reached £4,000. The Duke of Westminster gives £2,000.

Change of Address.—Messrs. Woolliscroft and Sons, Ltd., of Hanley, Staffs., have changed their London address to 76A, Great Portland Street, Oxford Circus, W.

An Organ Recital was held at the Temple Church last week to celebrate the renovation of the famous organ built by Father Smith two centuries ago.

At St. Matthew's Church, Bankfoot, Perthshire, a stained-glass window has been placed in the north wall by Messrs. Powell Brothers, of Leeds.

Two Workmen were Killed last week by falling from the scaffold on which they were engaged in repairing the gashouse chimney at Wakefield prison.

Sir Richard Thorne Thorne, K.C.B., principal medical officer to the Local Government Board, died last week. He was born at Leamington in 1842.

The Old House in Golder's Hill Park is proposed to be turned into a temporary convalescent home for wounded soldiers. It will shortly become the property of the London County Council.

A new Liberal Club at Tranmere has been built from designs by Mr. T. Taliesin Rees, F.R.I.B.A., of Birkenhead. Messrs. John Lee and Son, of Bebington, were the contractors.

An Old City School—Lady Holle's School for Girls, Cripplegate, is shortly to be demolished by the London County Council, who have purchased the site for the purposes of a new fire station.

Aberdeen University is proposed to be extended to Queen Street. Taking into account the £20,000 of debt, it is estimated that the total cost of completing the scheme will be about £80,000.

The French Academy of Fine Arts has chosen M. Vallaury, architect of the Ottoman Government, at Constantinople, a former student of the École des Beaux Arts in Paris, as a corresponding member in the architectural section, to replace M. Vespignani, of Rome.

A Memorial for Canterbury.—A memorial to the officers and men of the 1st Battalion Buffs (East Kent Regiment), who fell in the Chitral and North-West Frontier Campaigns, is to be erected in the nave of Canterbury Cathedral and will be unveiled in January.

£23,000 for Four Pieces of Tapestry.—Four of the finest pieces of tapestry turned out by the celebrated Gobelins looms in the last century have just been purchased for £23,200 in Italy, and brought back to France by Dr. Henri de Rothschild, who will add them to his Paris collection. The pieces were gifts presented by Louis Quinze to the Marquis de Grimaldi, the then Spanish Prime Minister.

The War Fund Art Exhibition.—Some complications seem likely to arise over the proposed exhibition of works of art for the benefit of the War Fund. A committee of artists, with Mr. M. H. Spielmann as hon. secretary, has been formed to decide upon the best way of carrying out the scheme. But now it appears that Mr. Harry Quilter has been maturing a similar project, only on a larger scale, and he advocates his idea against what are presumed to be the intentions of the artists. It is a pity that there should be any division of opinion on such a subject, and it is to be hoped that there will be no attempt to organise two competing shows. Either the artists must give way to Mr. Quilter, who claims to have been first in the field, or Mr. Quilter must retire in the face of numbers. The exhibition most likely to secure the confidence of the public will be the one most worth carrying out.

M. Yveling-Rambaud, the French novelist, is dead. He was a prolific writer on modern art.

Belfast Engineering Works Gutted.—Messrs. Coombes' extensive engineering works at Belfast were gutted by fire last week. The damage, which is fully covered by insurance, is estimated at about £8,500.

The Salon of the Société des Artistes Français will open next year on April 7th, which is three weeks earlier than has been the case for many seasons past. The object is to prevent competition with the Exhibition.

The Royal Institute of Architects of Ireland held their annual meeting recently, the president, Mr. Thomas Drew, being in the chair. The muster roll now includes twenty-five fellows, sixty-three members, and six probationers.

The Collapse of a Floor at Finsbury.—During the inquest on the body of the workman who was killed in this accident (which we reported last week), evidence showed that it was the cutting away of a portion of the concrete foundation for the purpose of forming a drain trench that caused the supporting iron columns to fall, bringing the floor with them. The jury said they were unable to blame anyone.

A Poster Competition.—A competition for a poster is announced by the International Artistic Association in Rome (via Margutta, 54), whose president is A. Apolloni. Sketches are to be handed in by March 30th, and the prize is 1,500 francs in gold. The object of the poster is to make known the kind of articles Cav. Sangiorgi deals in, namely, tapestries, bronzes, statues, &c.

The accommodation at the Royal Courts of Justice is found to be inadequate for present needs; it is seventeen years since they were opened by the Queen. The Benchers of Lincoln's Inn have granted the use of their old hall as an "overflow" court for Mr. Justice Farewell in the New Year. The strip of land on the west side of the Law Courts, now laid out as a garden, was intended for future extensions, but it would seem a pity to build over such an excellent and much-desired open space.

Muirhead and Birkhill Drainage Scheme.—In the report which Mr. John Anderson, sanitary inspector, has drawn up in connection with this scheme it is stated that according to plans submitted in 1896 it was intended to have an outlet for each village. Since then the treatment of sewage has been modified and improved and only one outlet is now proposed, which is to be situated at the west end of the village of Muirhead. On the Dundee and Coupar Angus Road, along which runs the main sewer, there is a rise on the surface from the south end of Blairfield Road to near Pyotdykes Quarry, and to obtain a working gradient of 1 in 400 a forced level would require to be made, necessitating a cutting of considerable depth at the summit. Therefore, if the main sewer were diverted southward and formed through the cultivated fields, and then northward by Liff Road to the Dundee and Coupar Angus Road, the depth of the cutting would be greatly reduced. In addition to the extra cost to be incurred by forming sewers sufficient to carry surface water the disposal works would have to be increased. According to experience gained, sewage is more efficiently treated without the addition of storm and other surface water, the yield of sewage being practically constant, while the quantity of surface water was uncertain. Mr. Anderson suggests that the sewage should be treated near the outlet by the septic tank system. The first cost of the works under this system would be considerable, but the annual cost of maintenance would be greatly reduced by the introduction of alternating apparatus (automatic). Arrangements would also have to be made for discharging the effluent into the Dighty stream. The probable estimate Mr. Anderson puts down at—Erecting sewage works proper, £1,037; allowance for rock, say, £100; disposal works, £525—total, £1,662.

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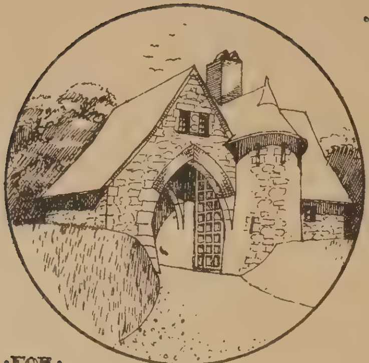

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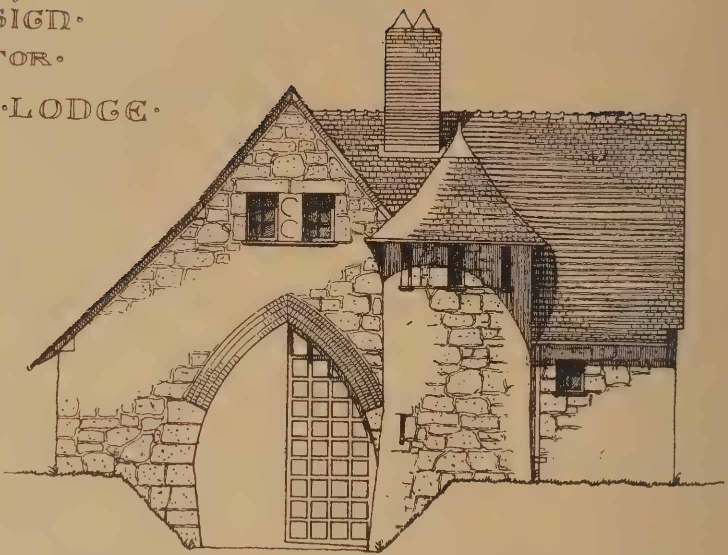

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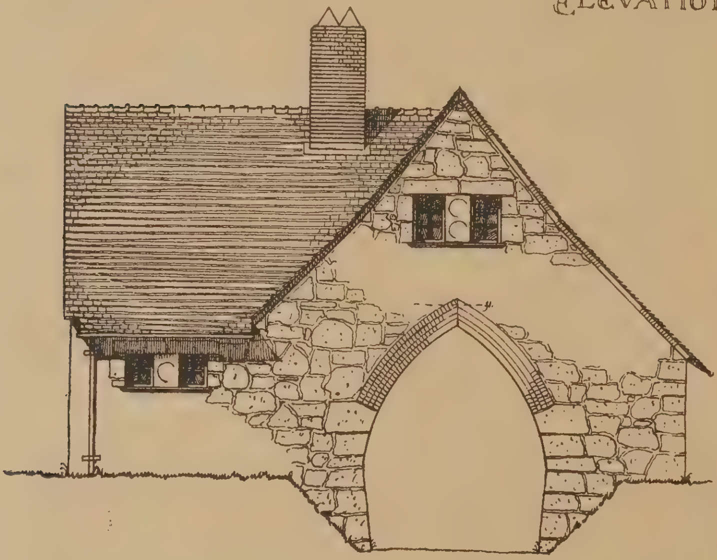

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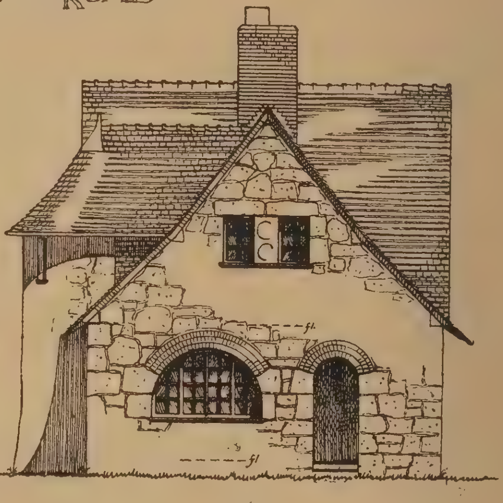

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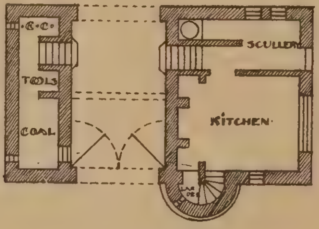

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DESIGN FOR A LODGE AT PENRHIWARDIR, TALYCAFN, N. WALES. HERBERT C. NORTH, B.A., ARCHITECT.

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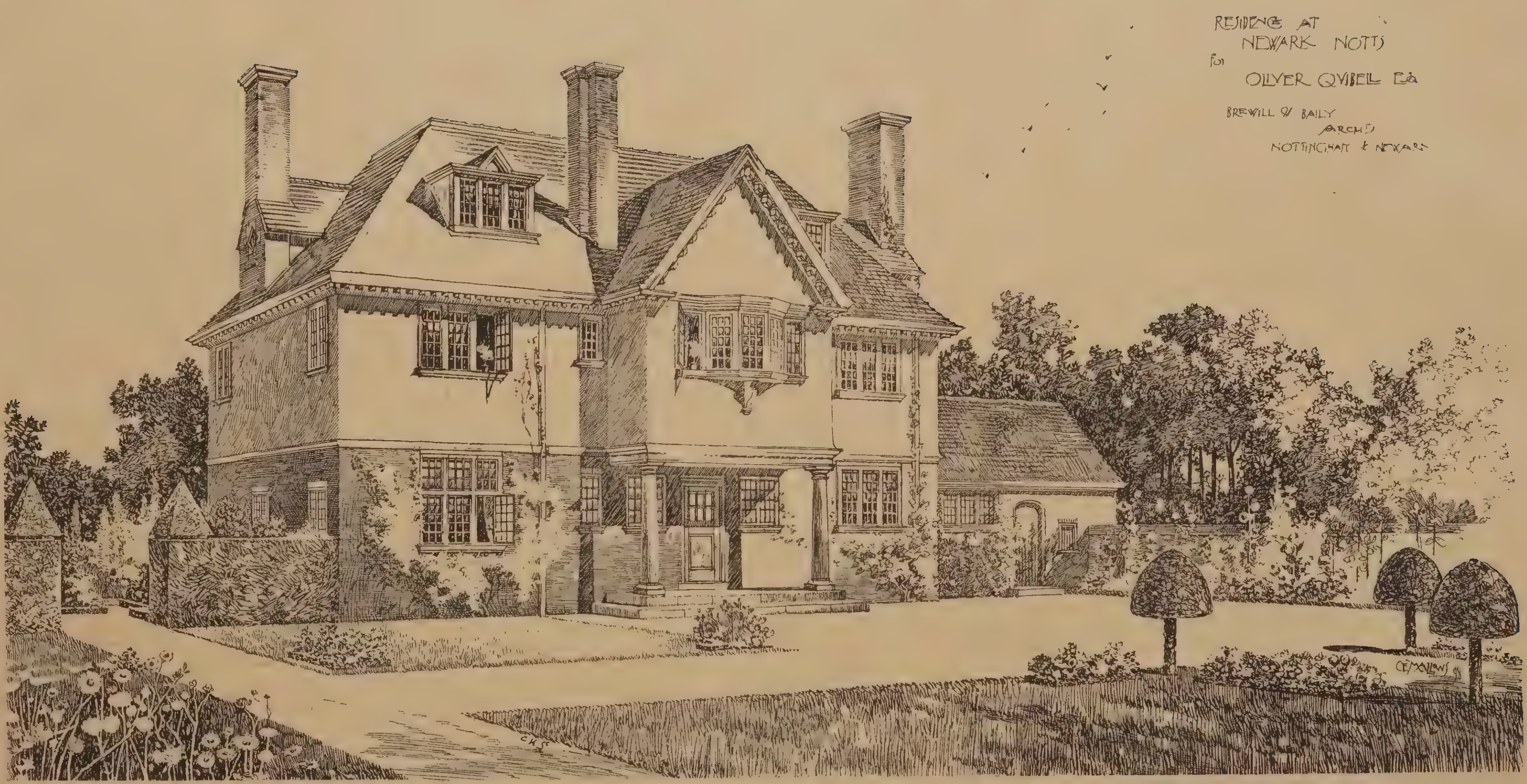
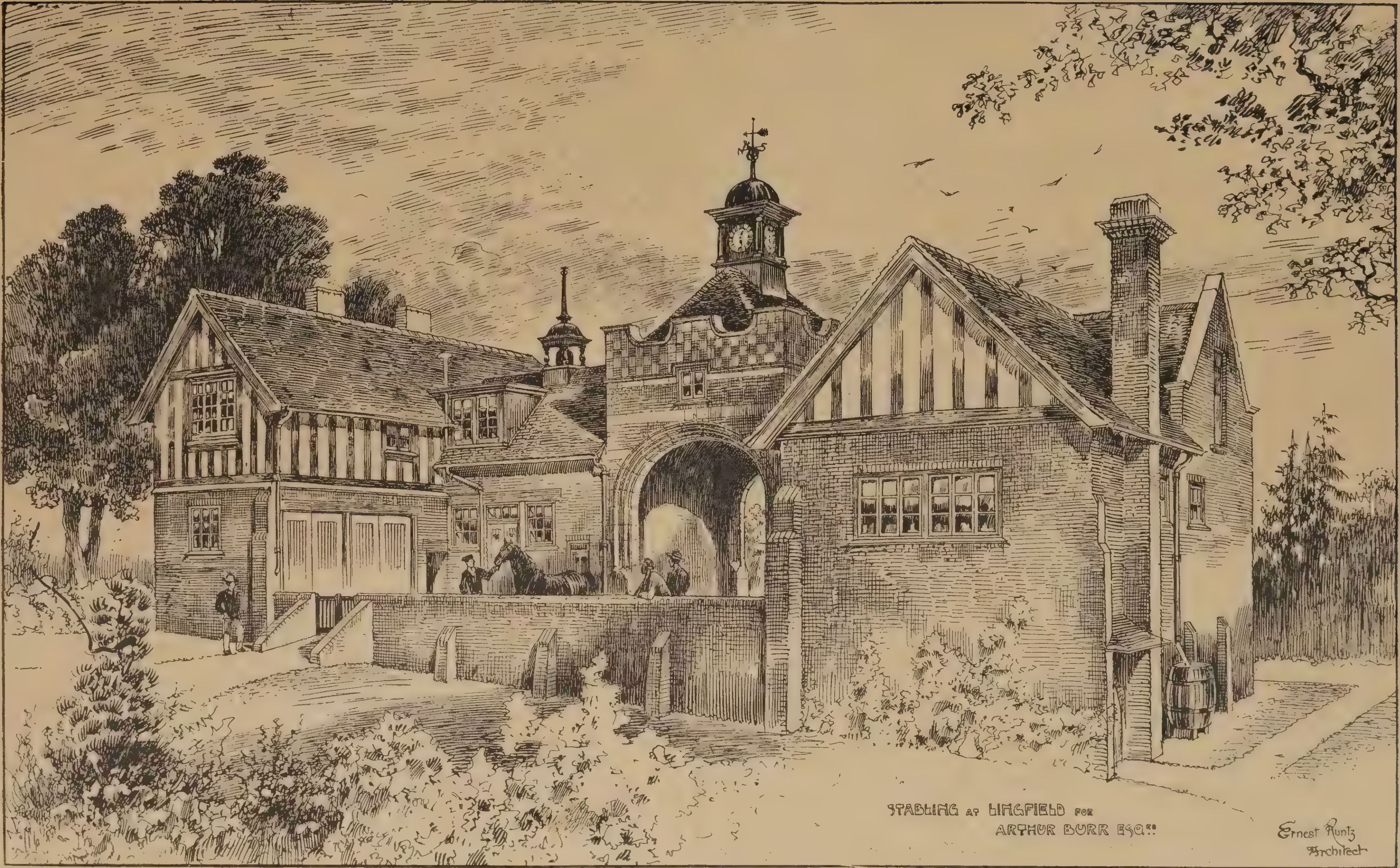


RESIDENCE ON LONDON ROAD, NEWARK, NOTTS. ARTHUR W. BREWILL, F.R.I.B.A., AND BASIL E. BAILEY, ARCHITECTS.



STABLING AT LINGFIELD. Ernest Runtz, Architect.

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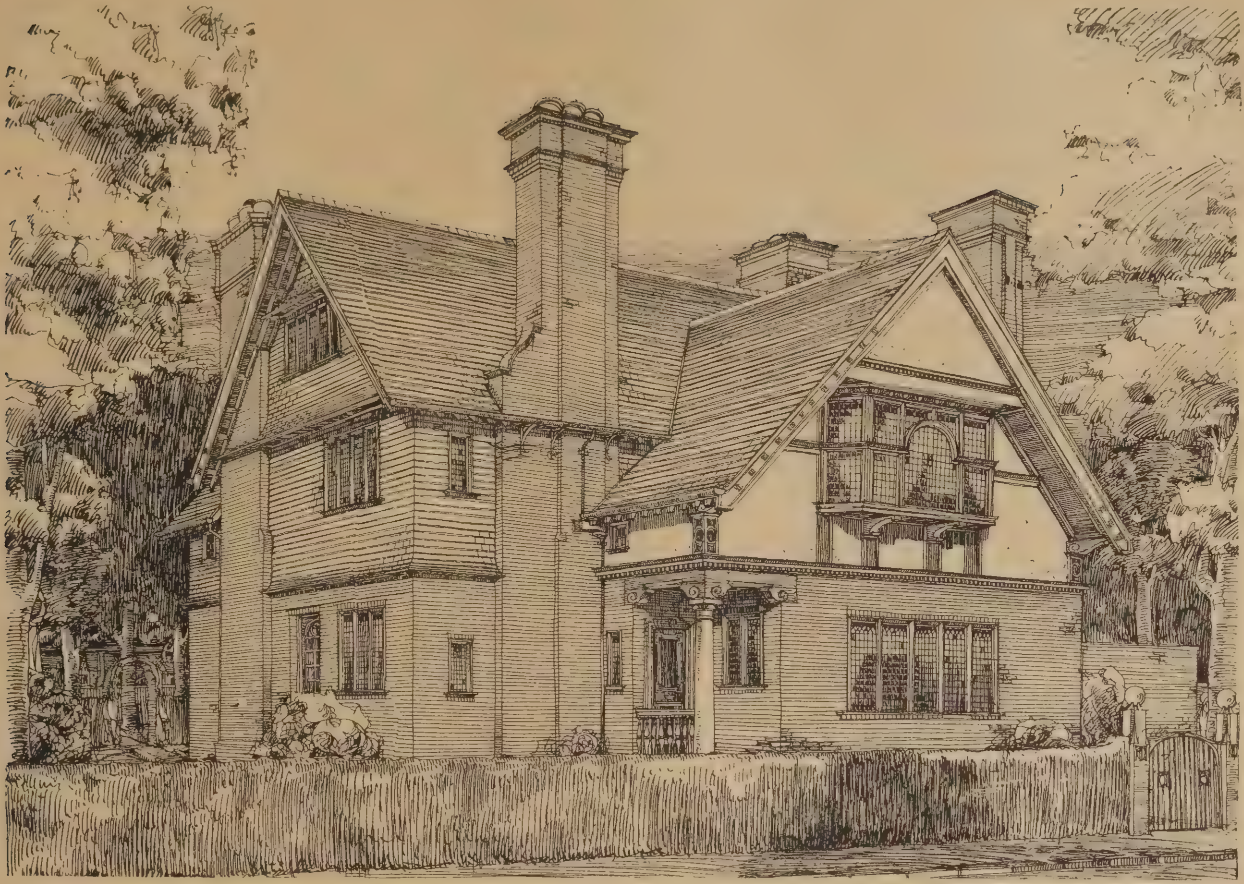
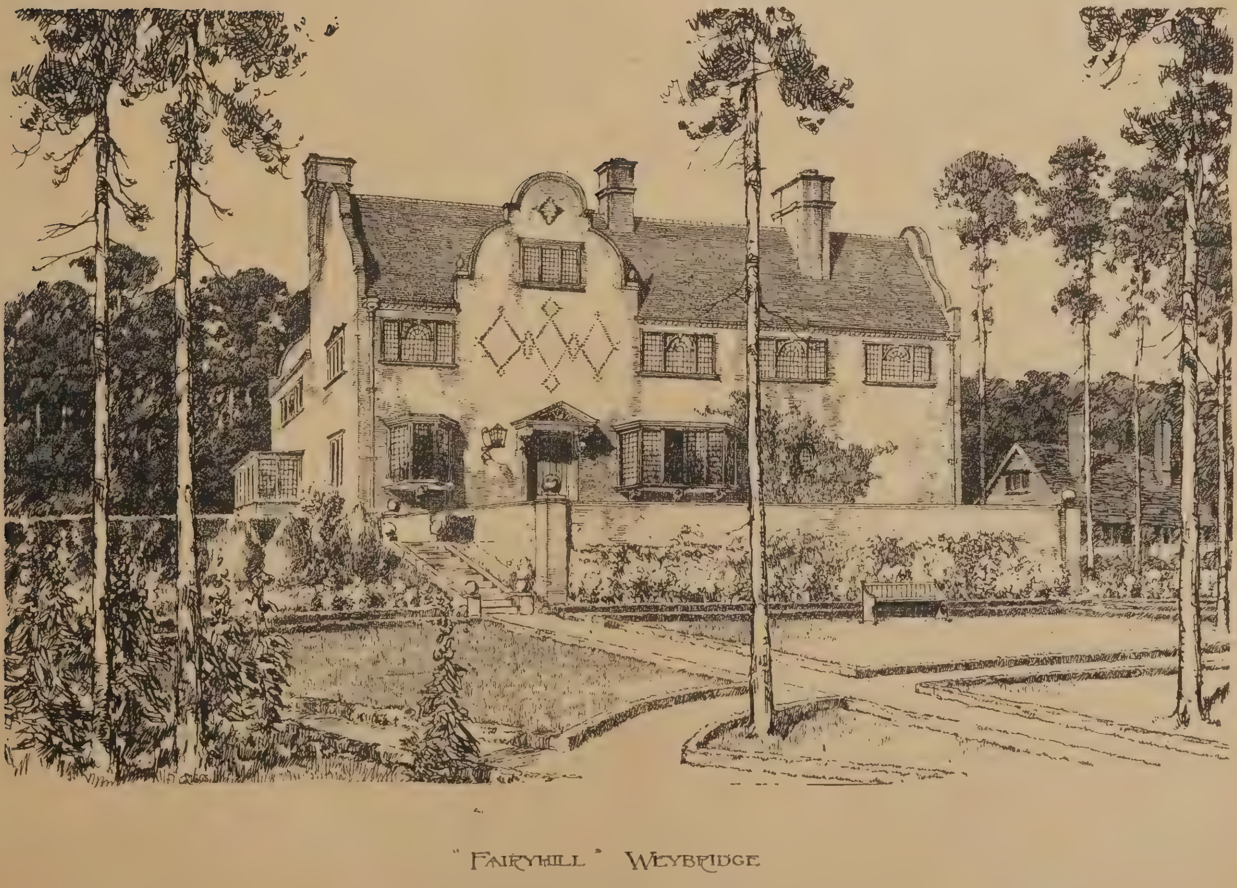


HOUSE AT WALTON-ON-THAMES. Niven and Wigglesworth, Architects.



"Fairyhill" Weybridge

Niven and Wigglesworth, Architects.

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AMERICA AND THE FRENCH SCHOOL OF ARCHITECTURE.

THIS topic, which is scarcely less interesting to English than to American architects, formed the main subject for consideration at the thirty-third annual convention of the American Institute of Architects, held at Pittsburgh on November 14th, 1899. We give below *résumés* of two important papers read by Mr. Ralph Adams Cram and Mr. H. Langford Warren, both of Boston.

Mr. Cram's paper was on "The Influence of the French School on American Architecture." He said:—I cannot admit that we are considering a matter of absolutely revolutionary importance—the coming of the architectural revelation to an hungry and waiting world. We have had several new dispensations before; even I remember three of them very distinctly. There was the Queen Anne affair, and a few years later the episode of Romanesque, and still later the Colonial excitement. Each was hailed with an enthusiasm that rivalled that which acclaims the advent of the Parisian Renaissance. Each passed, and the drawing-boards that once knew them now know them no more. Is this to be the fate of the latest fashion that we have imported with our champagne and Easter millinery? There was much good accrued to us from each of the three architectural events of the post-centennial. The Queen Anne craze served the part of the swallow of salt water in the case of sea-sickness—it prepared the system. Romanesque gave us some idea of what vigour and power and honesty meant in our work. Colonial suggested to us the value of historical association—of ethnical continuity. And the Parisian Renaissance? I honestly think it will do more good than any of the others. But is it the last word in our architectural development? Is it the revelation of all truth, of the final and perfect style? I have seen the rise and fall of Queen Anne, of Romanesque, and of Colonial; I have lost my illusions; I hold it only an episode.

Yet it is an episode that has only begun—let us grant that. Thus far it has done much good and more harm; when its work is finished the good will have outweighed the evil. In time we shall come to discriminate between what is permanent and what is evanescent in the movement. On the one side we shall put the underlying principles of modern classicism—these are the lasting qualities; on the other side we shall put the style itself—this is the accident, the matter without vitality or moment. In a word, the motive is good, the style bad.

The advantage that thus far has accrued to us—and it is very great—is the sense of fundamental law, of a certain self-restraint, of the subordination of personality in radical things to something that is larger than the individual. With us architecture for a quarter of a century has been another name for æsthetic anarchy—every man for himself and the client take the hindermost. We have planned in the happy-go-lucky fashion that prevails in England, and with almost as unhappy results. We have had as little idea of the sanctity of style as the German designers of churches. Our architectural education has been primary, not even rudimentary. Now a reform has begun, and, like all reforms, it has overshot the mark. It tends to curb our frontier originality, to make us something but self-satisfied units, but in the flush of its popularity it tries to force the style with which it is associated, purely by accident, as the one and only style that righteous men can employ.

This is the phase of the new *régime* that I must protest against, and not against the big principles of planning, composition, and design, not even the methods of teaching these, but against the narrow enthusiasm that confuses a cheap and facile style with principles that are really fundamental. If the advocates of the new school would only take their stand on the really unassailable principles that drive them, instead of on the casual style that happens to be associated with them for the moment, there could be no chance for a quarrel.

It is unfortunate, in a way, that this most salutary movement should be linked with a style so limited, and so, shall I say, superficial. Still, it is hard to see how else it could have come except in this company. France is the only European country where there is a logical system of training, and France has preserved the style of the Renaissance with more vitality than it has been elsewhere. In England, Germany, America, it was quite dead, though unfortunately unburied. The new scholasticism has made it thoroughly living in France, and already it has been galvanised into life in this country. But was it really worth this? Living it is, but is it not the fictitious vitality of a style that has steadily degenerated since the sixteenth century?

M. Taine once said: "There are but two orders of architecture—Greek and Gothic—all else is imitation," and certainly no one claims that the developments of the Classic style from the days of the Parthenon down to those of M. Garnier's Opera House have added anything of essential value to the primal type; it has been imitation and—degradation, so far as the great principles of building are concerned. By "degradation" I do not necessarily imply a reproach to the style; indeed, the word is a measure of praise, for it shows that architecture has performed its just function, and has adapted itself delicately to the changing conditions of civilisation. Architecture is good if it expresses the time and the people and the spirit that made it possible; it is bad if it is an affectation. Really, I suppose we have less concern with the relative perfection of the style itself than we have with its fitness. The Parisian Renaissance of the boulevards is better architecture than would be the Doric of Greece were it restored on the Champs Elysées, or the Gothic of Isle de France on the Rue de Rivoli, and yet, in the abstract, as they will appear in the architectural histories of a century hence, the Greek and the Gothic are good, the Renaissance bad.

So, after all, it is worse than useless to dispute as to whether Parisian Renaissance is really a good style or a bad—for France. It is inevitable, it expresses the time and the people and the thing they are pleased to call civilisation, therefore it is a thousand times more respectable than the archæological Gothic of the thirteenth century pasted over the outside of English law-courts, or the barbaric solemnities of the Auvergne when they try to express nineteenth-century Protestantism.

Let us grant this; let us confess that architecture in France is living, and that the style is just as appropriate to the time as was Doric to that of Pericles; what then? Is there any reason why we should seize upon it and force it on our own civilization? If not wherein is the cult of the École any less affected than we who borrow a style for church building from another land? Are they not dealing with an alien style? Or have we something in this country, some phase of life, some method of thought, that demands the architectural language of Republican France for its fullest expression? Yes, we have, and that very fact justifies Parisian Renaissance—just so far, but not an inch farther.

I have already referred to the great principles of design that underlie modern architecture in France; it is unnecessary to specify them or to urge their acceptance. We all admit them. By this I do not mean that we admit all the *methods* used in France to inculcate them; but that is another story, and one not to be touched on here. The principles themselves we are all anxious to adopt; they are exactly as operative in the planning of a Gothic cathedral as they are in the laying out of a scheme of a palace for the President of the French Republic. These principles are independent of style. But the style itself? Here is the ground of contest? Why in Heaven's name should we take it if we do not want it, and if it does not fit our case? It is not particularly beautiful, and it *is* thoroughly French; besides, it is about as narrow and as limited as any. There are certain things it cannot express, certain places where it would be an egregious offence, just as fifteenth century Gothic would be an offence in a fire-engine house or a Turkish bath.

We read history and we realise that always in the past one style has been enough for any given time and people, and recognising the implied reproach on our own epoch, when this condition does not seem to hold, we hunger for some one style which shall be for us the one, inevitable thing. This I believe to be absolutely, though not necessarily forever, impossible. Architecture, if it is real, must be accurately expressive of the impulses that create it. Well, we have now not one impulse, but a hundred. Once life was a thing of unity; Church and State, industry and commerce, society and recreation were united in a whole that seemed insoluble. This condition exists no longer. Life is coming to be as various almost as the units that compose society; there is no longer unity or identity. Can we conceive of an architectural style that should express all? Certainly not; any attempt to evolve or import one is vain; any style that tries to perform this function is affected and in the end ridiculous. I do not apply this criticism to the latest fashion alone; it is quite as valid in the case of Gothic or Romanesque or Colonial or any other style of history. When society was a unit art was instinctive; it was the language of a people—not, as now, the thousand dialects of antagonistic cliques. Whoever tries to establish a universal style, or delude himself into the belief that such can be achieved, looks at architecture as a thing not as a condition. Self-conscious we must be; it is our destiny, the penalty we pay for the peculiar kind of civilisation that pleases us for the moment. We are utterly unable to create art instinctively, and the sooner we recognise this the better for art and ourselves.

Just here lies, I firmly believe, the vital error of the advocates of Parisian Renaissance. They try to force an alien style on us for all our uses, when really it fits only a few of them. On second thoughts, this is not quite just; they realise that where churches are concerned their style is quite absurd; therefore, since the style *must* be right and sufficient, churches are an anomaly and must be ignored. There is something wrong here. The frivolous Renaissance of the *ateliers* is recognised as impossible, therefore it cannot possibly be a vital, national, universal style; a return to historic periods is necessary, but then what becomes of all the boasted fundamental laws that should make good work inevitable, whatever the chosen style? The system has been tested and it has failed. For the leaders and followers of the Parisian Renaissance cannot, ostrich-like, thrust their heads in the sand and so obliterate religion. The Church is, and must be, counted with. It is also certain that with the exception of medium-cost dwellings there is no opportunity more common. But the French school of American architects is driven to the curious position of having to deny both these things for the simple reason that the style they affect is not cognisant of Christianity.

And if it is true that the new fashion is powerless before the church, so is it true that it has little excuse in some other places. As I understand it, it is a style purely French, or, rather, purely Parisian; it fits Gallic civilisation like a glove, and so it is good—in France. But we are English by blood, and we do not think in French ways, neither do we altogether act in them. Why, then, is it any less affected for us to import a style from Paris than from England? Why is Parisian Renaissance a more logical form of architecture than English Gothic? Because it is nineteenth century? So is English Gothic—now. The classic of Napoleon's time was pretty dead, as dead as Gothic in England under the Hanoverian Georges. It is vital now; so is Gothic, just exactly as living and spontaneous and contemporary as Parisian Renaissance. It is not a case of living styles, one of which is French, one English.

Do not think that I advocate either the one or the other exclusively. If we are English by blood and sympathy, we are French by perversity, and all must be expressed. There is much in our society that can better be expressed through the French style than any other; there is much in our civil life, our political life, that might as well use this form of expression as any; all are too good for it, even modern German or English commercial architectures, but there is a lot, and that the very best we have, that has no more kinship with the pleasing conceits of the boulevards than it has with Norman Romanesque or the Buddhist architecture of Japan. In these directions, I humbly submit, Parisian Renaissance, *as a style,* meets with the sign "*rue barrée.*"

And what shall assume its place? Just whatever style seems best to fit the power that gives the impulse. Is it the Church? There the answer is the splendid Gothic that Bodley, Sedding, and Austin and Paley, and their scores of associates have restored to life and vigor. Is it higher education, the education of colleges and universities? The answer is the same. We are English; neither French nor Italian; therefore, let us not sell our birthright for a mess of—*potage du jour!* As for our commercial work, we are working that out all right as it is; it demands a new style and we are achieving it, but not by way of the École; rather by obeying the dictates of common sense.

All hopes of a single style are vain. What our civilisation is, that must our art be also, and our civilisation is as various as our population.

To recapitulate, then, the influence of the French school is good just so long as it is the influence of solid and lasting principles of planning, of composition, of design; so long as it insists on vitality and modernism instead of archæological erudition; so long as it demands subservience to law and order; so long, in a word, as it deals with fundamentals. It is evil when it confuses an accident of fashion and *locale* with the things that really matter; when it binds itself to the latest vagary of French fancy; when it affects to despise the Church and her architecture, and to look on Gothic as a barbaric episode; when it tries to force on a branch of the Anglo-Saxon race for all its purposes, a style that is Gallic in its impulse, evanescent in its nature.

It is this ill-advised and, I am convinced, unjustified fanaticism for a certain accidental mode against which I continually protest; it is the mistaken view of a great system of education which I regret to see introduced into our architectural schools, not the fundamental system itself. Ruskin was a bigot, and he made himself absurd by his frantic advocacy of certain forms of architecture; frankly, I think some of these who now most strenuously uphold exactly what he with equal vigour denied are laying themselves open to the same condemnation. Above all things, let us have —in architecture—no bigotry. Let us look at the thing sensibly and in cold blood, allowing ourselves to be led away by no tempests of fanaticism. We want architecture that will be logical and national, and expressive of the agency that calls it into being. We cannot create a style, for we have not finished creating a civilisation as yet, and that must come first, but we have various powers or agencies that exist more or less independently of national civilisation and are not consequent upon it.

Mr. H. Langford Warren dealt with "The Influence of France upon American Architecture." He said:—From the days of the Revolution, when the support of Lafayette and his followers brought the two countries into close relations of friendship, the influence of French architecture has been a factor in our architectural development—or in the changes from which until lately we may be said to have suffered. To discuss it fully would require us to consider the story of our architecture during the present century, as well as that of France. It is, nevertheless, only within the past thirty years, or thereabouts, that French influence upon American architecture has counted for much, and it is a still briefer period since it has anywhere in the country shown signs of predominance.

At the beginning of the century the architecture of this country was still for the most part in the hands of simple craftsmen who were carrying on the traditions of the Colonial period. But the loss of traditional skill among the craftsmen themselves and the rival and confusing claims of Greek and Gothic revivals, rapidly produced that condition of chaos and entire absence of wholesome tradition, which made the advent of the educated and professionally trained architect the only way out.

American architecture suffered grievously during more than the first half of this century through the want of properly trained practitioners. In the main, after about 1820, the succession of architectural fashions showed a ghastly parody of the work going on at the same time in England—work, some of it, weak enough in itself. During this period appear the names of a few French architects. At the beginning of the century their work did not differ essentially from that of the English architects who found their way hither or from the few educated Americans, for at this time Roman classicism (variously understood) reigned everywhere, and as long as it continued exercised a wholesome restraining influence. In the chaotic days of the forties, fifties and sixties French names very rarely appear, and the only marked evidence of French influence was in the advent of the so-called French roofs, which appeared for the first time, we believe, in the Deacon House, in Boston, built about 1850, the work of a French architect named Le Moulnier. The American builders of those days were sure to make ridiculous even their attempt to imitate good things; but this somewhat unreasonable contrivance, aided by the jig-saw, became in their hands the source of more ugliness than even America has otherwise seen.

Into this chaos gradually and in increasing numbers came, during the sixties and seventies, the educated architects. They came from two main sources. On the one hand from England, or under more or less direct English influence, partly by the immigration of Englishmen trained in the ideals of the English Gothic Revival, partly they were Americans who in English offices or through travel had received a similar training. The second source was France, and this influence was brought to us directly at this time by Richard M. Hunt, who received his education at the École des Beaux-Arts. In 1867 the department of architecture at the Massachusetts Institute of Technology was opened under the direction of Professor Ware, and the scheme of instruction was frankly based on that of the Paris school, adapted to meet the very different circumstances and requirements. In 1871 M. Eugène Létang came from Paris to take charge, under Mr. Ware, of the work in design. Since then every important school of architecture that has been founded in America has sooner or later followed, more of less closely, the same model. Indeed it may be said to be all but universally acknowledged that the French system of instruction in architecture is the best in the world. Meanwhile an ever increasing number of Americans have been educated in the French school itself.

Great changes have recently taken place in France itself, changes of which it is essential we should take account in forming an opinion as to the value of French influence at this moment. In spite of its fine qualities, almost unrivalled in the modern world, there has been constantly apparent in French architecture, since the time of Louis XIV., a note of extravagance, of theatrical display, of redundant, and sometimes tasteless, ornament, which has frequently injured some of its finest productions; but there have nearly always been men like Labroust, Daumet, Vaudremer, who have by precept and example, set their faces against this extravagance. But the wave of indiscriminate admiration of the vagaries and vulgarities of Rococo architecture, which has of late swept over the civilised world like a plague, has made itself felt nowhere more strongly than in Paris, and the mad craze of novelty for the sake of novelty has run riot in an extravagance of *hautes nouveautés* is enough to make Labroust and even André turn in their graves. The designs for the forthcoming Paris Exposition, which, magnificent as it is in conception and general composition, are producing structures almost delirious in their unreasonable and wanton ugliness. There are, of course, men still doing superb work, and the sound traditions of French training still make themselves felt amid all the extravagance and vulgar search for the merely novel—miscalled originality. But the main tone of French work at this moment, the main trend of taste at the École, has sadly changed since the *ateliers* of André and of Vaudremer, at opposite ends of the scale, were typical. This change, like every phase of human development, is expressive of the condition of the community that produced it. The want of sane, wholesome life, of high and pure and sweet ideals has its inevitable effect on taste in the fine arts. The jaded and sated palate calls for some new sensation, and the result is all the more deplorable because of evident ability and training prostituted.

The training of the École des Beaux-Arts, shaken though it had been by the Neo-Greek movement of the middle of the century, and, in spite of extravagance, which already showed itself, was still, even twenty years ago, synonymous with the somewhat rigid traditional Classicism which had been so powerfully inveighed against by Viollet-le-Duc. Cold and unsympathetic as it sometimes was, it had at any rate this advantage: that it tended to curb the growing tendency to license, and that it was a safe medium for instruction in the fundamental principles of architecture. New forms and modifications were looked at somewhat askance, and were only gradually admitted, as it were, to recognised standing. It was somewhat unyielding, and its notion of correctness of style was still mainly a matter of tradition. But what then, as now, constituted the strength of French training and practice was its insistence on composition, its excellence of proportion and mass, and, above all, its splendid mastery of monumental planning. It taught careful consideration of fenestration, the study of light and shade, the effective placing of ornament, and showed that rhythmic proportion has relation to all these. It insisted that a building must tell its story; that it must be expressive of its purpose, and that the exterior must be expressive of the interior arrangement, of the plan, which is the key to the whole composition. Interior and exterior, plan and elevation, must work together to produce one organic and rhythmically connected whole. In insisting upon these things, it was teaching that architectural design depends, not upon caprice, but upon principle, and it gave, up to a certain point, some understanding of what these principles are. In doing all this it inculcated, though perhaps not always clearly, the fundamental laws upon which good architecture, upon which fine art of every description, have always depended and always will depend. And it taught and still teaches what, perhaps, after all, is for the impatient American the most important lesson, that good results in the fine arts are only to be attained, in the first place, by long and patient and severe training; and, in the next, by equally patient and painstaking study and restudy of each problem as it arises. On the other hand, the principles taught seemed to stop at the ornament, as if the smallest part of any work of art could be subject to any other laws than those that must govern the whole, or as if one part must be a matter of principle while another could be a matter of mere tradition or of caprice. The ornament —most of the detail, in fact—though often carefully studied and always delicately executed, was apt to be either meaningless and extravagant or coldly traditional in its form.

Moreover, the training of the École, while thorough along its chosen lines, was narrow, so that those brought up exclusively under its influence were generally strangely ignorant of all forms of architecture except those which were traditional within the school. They had made no adequate study of the historic styles, and so had no understanding or appreciation of the way in which the immutable principles of design expressed themselves in other forms and under other conditions. Their experience was so narrow that the laws of design could not be thoroughly appreciated as the result of principle, and these laws thus became in their hands little more than a set of academic formulæ. The designs produced and the judgment formed were alike too apt to be the mere conventional result of conventional rules, the reasons for which were but dimly apprehended.

The inevitable revolt against this rigidity grew apace, and the reaction under existing conditions in France has led to that license of design which we have already characterised. The fundamental laws of composition are still taught as before, but originality, so called —mere capricious novelty—has become the standard rather than beauty and reasonableness. Its ideals are no longer those of purity and of expressiveness of architectural form, but of novelty. Expressiveness of a kind is indeed aimed at, but it takes the unimaginative form of, for instance, ornamenting the exterior of an army and navy building with cannon-balls, gun cartridges and conning towers, put on without the slightest regard to the architectural purpose of the parts to which they are applied.

If there is one thing that the American public has needed for the improvement of its taste in art, it is to be taught that there is something better than novelty and change; that what is beautiful and reasonable is the ideal to be aimed at, not to be "up-to-date" or "in fashion." It needs to be taught that the finest things in art are usually the simplest—those things which at first sight seem easiest, most obvious, most natural—not those things which by their overloaded ornament, their *bizarrerie*, their theatrical posturing cry out for attention. We need to appreciate that those qualities which make fine manners also make fine art—restraint, repose, naturalness, graciousness. We have been learning these things, but are not helped forward by indiscriminate admiration of this latest and least admirable phase of French art. It is curious that those who are loudest in its praise are those who least of all show signs of putting one of the chief precepts of its doctrine into practice in this country. This doctrine teaches, and rightly teaches, that a country can have a vital art only in so far as it solves its own problems in its own way, expressing freely its own ideals in meeting its own wants. The art of France is held up to admiration as being such a vital art. This is to a degree true, and that art expresses French ideals, French taste—and also French depravity. Now we do not take a single step towards producing an art of our own by a direct importation in all its details of the forms of French architecture, which have nothing whatever to do with the principles taught in the French school, but are the mere accidents of environment. On the contrary, whatever beginnings of vital work that are found in our midst are strangled by such direct imitation. The French style meets our wants most nearly, it is argued, because it is the most modern. This is manifestly a *non sequitur*.

What we need is to understand more and more fully those fundamental principles of our art which underlie the best work of all times and all styles; to understand and know thoroughly the architectural forms of the past, and appreciate how in them these principles were expressed; to use these forms in our own work freely, varying from them not capriciously, but according to principle, as changed conditions, changed modes of construction, changed ideals seem to require. Working in this way, the modifications which come will not be forced, but natural, and will have that quality of inevitableness which is inseparable from vital work, and is one of its greatest charms.

We have learned much from France, and yet have much to learn; but let us not take from her indiscriminately. In so far as the French influence helps us to sound methods of education; in so far as it teaches us composition, monumental planning, the importance of balance and proportion in plan and mass; as it leads us to regard our buildings as organic unities, and to make exterior and interior hold together as rhythmical component parts of one whole; as it leads to careful consideration of fenestration, of light and shade, and of scale relations; as it discourages hasty and slipshod and ill-studied work; in so far, in short, as it helps us to principles and to devoted and painstaking study, its influence has been, and will be, helpful and wholesome. But in so far as it leads us to mere copyism of the externals of recent French buildings; in so far as it leads us to seek novelty in place of excellence; in so far as it encourages a taste for extravagant and overloaded ornamentation, and tends to destroy delight in simple and quiet work—in so far as it does these things, the French influence is deeply to be deplored.

THE LIGHTING OF ROOMS.

A GOODLY part of the usefulness of a house comes at night, for it is then that hosts most generally throw open their doors; hence the problem of artificial lighting becomes a very important one. Many houses are ruined by bad lighting, some having too much and others too little light. Fortunately, as it happens, one simple rule rigidly adhered to will solve many difficulties. The lights should never be so arranged as to shine directly in anyone's eyes, and for this reason the lights should be low and well shaded. In reading, the light should never be more than a foot, at the most, higher than the eye, and it should be so shaded that not a ray can fall directly upon the eye itself, but only in a full flood upon the object engaging one's attention. As to the other lights in the room, they need not be placed quite so low as the reading lamp or light, although for decorative purposes it is generally better not to place them too high. But from whatever height it comes, the light should meet the eye softened by glass, china, silk, or paper. Comfort absolutely demands the shaded light, and so does decorative beauty, and really the shades of the lights provide the easiest means of successfully introducing colour into any scheme of decoration. Though lights of various colours can be used, the best effect is, perhaps, obtained by having all the lights in the room of a similar colour. A drawing-room provided with pink lights looks well; red and yellow are also good colours. A library papered in green, with white woodwork, looks peculiarly restful and studious with the somewhat old-fashioned white-lined green shades on the reading lamps. Blue and most greens are to be avoided, as they are apt to give the persons in the room a ghastly appearance. When a ring of gas jets near the ceiling are lighted the whole room looks barren, the ceiling itself becomes the most prominent feature of the apartment and its bare expanse dominates the whole place. But if the lights are put down a little lower, a great improvement will be noticed. There are, of course exceptions — a ballroom for example: here the hard brilliancy of uncovered lights is exactly what is needed. The methods employed for reflecting light from ceilings and walls are too numerous and in some cases, too complex to be dealt with here.

W. N. B.

The Grosvenor Hotel, London, which was recently purchased by the Brighton Railway Company, will be opened next season under the administration of the "Gordon Hotels, Limited." Important structural alterations, involving the closing of the hotel for three or four months, will be immediately undertaken, under the supervision of Mr. Alfred Waterhouse, R.A., and Mr. Morgan, the Brighton Company's engineer.

British Art at the Paris Exhibition.—The space allotted for British works of art executed since May 1st, 1889, consists of three rooms and part of a corridor in the new Palace of Fine Art. These rooms afford 466ft. run of wall space available for hanging paintings, drawings, &c. Sculpture of all nationalities will be distributed throughout the building at the discretion of the French authorities. Works of art will also be exhibited in the British pavilion on the Quai d'Orsay, but the Royal Commission have decided to reserve this building mainly for the display of works by old masters of the British school.

Bricks and Mortar.

Aphorism for the Week.

"The key to a work of art is the man himself, his habits, his whole way of regarding life. To fathom the meaning of a picture of Leonardo one has to recall the dreamer and the poet—the intellectual exquisite, the man of extreme physical beauty; the austerity of Inigo Jones's architecture is better understood when one realises the stiff, unbending nature of the man, that proud, masterful temper which earned the undying hatred of Ben Jonson. So, too, with Wren, his easy, kindly nature is written in his work."—Reginald Blomfield.

Our Inset Sheets. The house at Newark has been erected for Mr. Oliver Quibell, and contains dining room, drawing room, and morning room, with sitting hall, together with the usual kitchen offices and outbuildings. The exterior is constructed of red sand brick and the upper portion of cement rough-cast, the roof being covered with red tiles. The cornice is constructed of wood, and, with the rest of the exterior woodwork, is painted white. The work has been carried out by Mr. William Smith, builder, of Newark, from designs by Messrs. Brewill and Baily, architects, of Nottingham and Newark.—The stables at Lingfield were erected in two sections. The portion to the left of the archway was first erected as a stable complete in itself; shortly afterwards, the coachhouse and additional stable accommodation were added. The materials used are red brick for the lower portion, rough timbering and plaster for the upper part, and tiles for the roof, with local stone for the dressings, &c., to the archway. Mr. Ernest Runtz, of 10, Walbrook, E.C., was the architect.—With regard to the lodge in North Wales, designed by Mr. Herbert L. North, B.A., architect, for R. Norton, Esq., the walling is of local coarse granite, the natural surfaces being of an orange tint and the cut surfaces blue-gray. The arches and verges are of Buckley dark brindled brick and Buckby lapped ridge tiles were used for the roof. The mullions to the windows and chimney cap are of Penman crystaline limestone. The slates are small third quality, violet and green mixed. There are three good bedrooms. Mr. Evan Humphreys, of Llanfairfechan, was the builder.—The house at Walton-on-Thames was designed by Messrs. Niven and Wigglesworth, of London. The walls are of red brick, the upper story tile-hung and cemented, and the roof tiled.—"Fairyhill," Weybridge, was recently built also from designs by Messrs. Niven and Wigglesworth, of London. The walls are of red brick, and the roof is tiled.

Vandalism in Cyprus. The two chief cities of Cyprus, Famagusta and Rhodes, contain examples of the very finest Gothic architecture in their old cathedrals, churches, palaces, fortifications, which are most rapidly being destroyed. Famagusta is fast disappearing; Port Said may be said to be built out of its stones, carried across to Egypt in little two-masted lighters at a very profitable rate. The priceless old carvings of angels, saints, lions, and what not, are roughly knocked off to render the stones square. The more complete destruction of the city is now contemplated. It is proposed to build a small harbour for coasting steamers within the shallow rocky port of ancient times. To effect this the great walls of the city, which still stand in the most perfect preservation as if abandoned but yesterday by the martyred Bragadino and his brave companions of 330 years ago, are to be utilised; their materials are to be taken for the purpose of forming a new quay wall for the tramway to run upon and of connecting the landing-stage beyond the northern extremity of the city with the village of Varosha, which lies about a mile and a half to the south. From this latter a tramway to Nicosia is to be commenced. It seems a terrible evidence of poverty, both material and sentimental, that a country like Cyprus should be unable to afford to retain such a marvellous mediæval monument as the old city of Famagusta, a possession which in the future must certainly attract the art-loving tourist and the artist.

The Metropolitan Tabernacle.

A hope had been entertained that the rebuilding of the Metropolitan Tabernacle would have been completed some months ago, but it was not realised, owing to the inability of the contractors to obtain the great iron ribs on which the roof is to be raised. The delay caused the building committee much disappointment. Though at the time the contract was entered into the firm concerned could not give any guarantee as to delivery within a specified period, they promised to forward the girders with as much expedition as possible; but the conditions of the iron trade prevented them from sending more than a portion of the whole. The contractors are only waiting the placing of all the girders in position and the roofing-in of the building to finish the other branches of the work. These are now in an advanced stage. The two galleries that run round the building, with their separate staircases, are practically finished. The concrete bed on which the wooden flooring of the auditorium will rest has been laid, as much of the plastering as it has been possible to proceed with has been done, and, substantially, the whole of the woodwork has been prepared. Every possible precaution has been and is being taken against another fire. The flooring and staircases throughout the building have been built of concrete, and the roof will be made of the same material. Steel, also, is being substituted for wood, wherever practicable. It is hoped that, at the very latest, the building will be ready by June next. But before the opening service can be held, a further sum of about £5,000 must be raised, the congregation being pledged not to open the Tabernacle until it is absolutely free from debt. The entire cost of rebuilding the Tabernacle and the Lower Hall will be £44,576, of which all but this £5,000 has been obtained.

"Fireproof" Floors that are not Fireproof.

There is nothing like a careful experiment for finding out the quality of anything; and this is what has been carried out by the British Fire Prevention Committee with a floor (10ft. by 10ft.) similar to that described by the Metropolitan Building Act as "fire-resisting." After a fire test of less than an hour and a half, during which time the maximum temperature reached was about 1,700deg. Fahr., the floor collapsed. The composition of the concrete used was exactly as defined by the London County Council in March last and the most favourable form of joist—the steel joist—was applied; and yet this so-called fireproof floor failed. When so many buildings constructed on the latest principles have been entirely gutted by fires, the plea that planning and means of escape should be the primary consideration cannot be too urgently supported. At the same time the production of floors or stairs that are really fireproof is a great need, and one which does not as yet appear to have been supplied, despite the fact that the patents dealing with the matter are multitudinous.

New Law Courts for Leeds.

There is considerable need of extra accommodation for departments of the Leeds Corporation and the city justices at the Town Hall, and it is probable that ere long steps will be taken to remedy the deficiency. There seems to be only one course open: the removal of the Law Courts from the Town Hall. The provision of an eligible site for new Law Courts would in all probability involve an extensive improvement. New Law Courts should of course have a central position, with ample space around them. Such a site is not now available, and it would have to be provided by the demolition of other property. It has been suggested that the best course is the acquisition of the property on the southern side of Victoria Square, as far back as the southern side of South Parade, the frontage extending from East Parade to Park Square. Some members of the Corporation are in favour of even a bolder step, viz., the clearing away of the whole of the block of which that property forms a part—that is to say, the block bounded by East Parade, King Street, Park Square, and Victoria Square. That would make feasible an improvement, the like of which has not been made in Leeds—a great open space in the heart of the city, which might have for part of its adornment new law courts and one or two other institutions which could be named. It is roughly computed that the clearing away of this extensive block would entail an expenditure of not less than a quarter of a million, and that the erection of the buildings and laying out of the open space would cost as much more.

Interior Decoration.

"Domestic Interiors" was the subject of a lecture delivered on December 19th before the Architectural Association of Ireland (Mr. George Sheridan, the president, in the chair) by Mr. R. Caulfield Orpen, B.A., past president. His remarks dealt with comfort as regards planning, decoration, and furnishing of the homes of men of moderate means. Comfort, both mental and physical, should be the initial principle. He deplored the extravagancies for which ladies are chiefly to blame, which compels us to fill our rooms with "modern antiques," individually beautiful, but not making for comfort. More absurd, however, was the affected simplicity of interior treatment, which had taken hold of the younger architects of to-day, and the lecturer sketched a room of this type with hooded ingle nook, panelled walls, exposed ceiling beams, &c., and asked how such a room could be furnished as a home without grotesque anachronism.

The Hippodrome.

The latest addition to the pleasure houses of London is the Hippodrome, which has been built in Charing Cross Road, from Mr. Frank Matcham's designs, close to Mr. Wyndham's new theatre. The ring has a colander bottom, which, when the horsemanship is over, will be sunk, and 57,000 gallons of water will well up for the water scenes. As it gushes up from the fountains, coloured lights thrown down from the roof will play on the splashing water and give a glimpse of fairyland. Further ahead and on a level with the water surface is the stage proper, separated from the ring by the conventional curtain. The private boxes go round the entire building, but what strikes one as the novelty of the building is the position of the orchestra, which will be situated in a sort of Royal box on the right of the stage on the first tier. Lighting is effected by four hammered-brass chandeliers, each pendant forming the corner of a square. Each chandelier will have forty lights of 16-candle power. The roof, moreover, has a circle of perforations, through which glass dishes, bearing more lights, will depend. Each private box (there are about twenty) will have its own illuminant—an electric light shaded by a little glass curtain. The curtain is flanked by gold. Gold, again, are the great chandeliers. Gold is on the great shell backing the orchestra. Cream and gold is the scheme of the garniture. Finally, there is the horse's head in stone, forming the culminating point of the ring.

An Ancient Border Church.

Considerable interest has been evoked in the border country around Carlisle by the final completion of the restoration—almost rebuilding—of Kirkbride Church, eight miles from Silloth. The church was erected some 500 years before the Norman Conquest on the site of a preaching station of the Scoto-Irish missionaries, who first of all promulgated Christianity in these northern parts. There are many signs of their presence in this part of the kingdom. Fifteen miles south-west is the church of Bridekirk, and nine miles north (in Scotland) there is the village of Brydekirk—all suggesting the dedicational name of St. Bride. For two hundred years the state of the fabric has been unsatisfactory, until the last rector, the Rev. J. Whiteside, undertook its preservation in 1895. He completed the chancel in a very effective style. When the Rev. W. R. Hopper, late curate of Heversham, became rector in 1896, he first of all paid off the debt on the chancel of upwards of £100 and then proceeded with the more serious undertaking of the nave. This has now been finished and the church has been reopened. In all the cost has been £900, towards which £800 has been collected. The church was built originally out of the materials of a Roman Camp on the spot, and in the time of the Border raids it was a fortress-church. The massive walls bear witness to its strength, and in the recent restoration a long recess was found in the south wall where a huge bar of iron went across the door and secured the inhabitants in the case of one of the numerous Border raids.

Yatton Church.

Travellers by the Great Western Railway between Bristol and Exeter cannot fail to have noticed the quaint tower and stunted spire of Yatton Church. The unfinished tower of the noble church of St. Mary Redcliffe, near Bristol station, once bore a resemblance to that at Yatton. St. Mary Redcliffe, however, has been spoiled by the addition of a lofty and pretentious spire, and there appears to be possible danger that Yatton may share the same fate after the lapse of five centuries. Its stunted spire has become very dilapidated, the stones have shifted, and daylight is visible between them on account of the mortar having fallen out. For Fifteenth Century work it would appear to have been bad masonry. The upper portion of the stair turret at the side of the tower is also demoralised and in places tower and turret have parted company. Mr. Buckle, the diocesan architect, from whose report these statements are taken, states that the dwarf spire must be taken down and rebuilt and the turret and adjacent portions repaired and strengthened. As to whether the spire is to be exactly reproduced or carried up to a lofty point, as the architect thinks was the original intention, Mr. Buckle points out that the present outline presents some beauty and gives a unique appearance to the church, and he is in favour of its reproduction. The tower was commenced in 1455, but when it was finished, or whether it was left unfinished, records do not show. That there was evidently something amiss is plain from the fact that between 1491 and 1563 the tower had been "pointed" no less than four times. It will cost about £1,100 to carry out the necessary repairs, and if Church people make haste to send that amount to the vicar, the Rev. J. Harrison, on condition that the present character of the tower be retained, they will help to preserve one of the most interesting landmarks in Somerset.

Finsbury Circus—New and Old.

There are a great many alterations being made in Finsbury Circus, which, built on the very confines of the City about the beginning of the century. It has hitherto worn a curiously suburban aspect, little altered by the fact that private residents have long since been ousted by solicitors and surveyors and an odd crowd of miscellaneous agents, and by the circumstance that even the basement rooms, once kitchens looking out upon still existent areas, have been converted into offices. Now, however, the south-western quarter of the Circus has been pulled down and a great clearance effected as far as London Wall. The remaining portions are to share the same fate. There are also being demolished two other buildings close by—the Ophthalmic Hospital and its next-door neighbour in Blomfield Street, the Roman Catholic Church of St. Mary Moorfields, consecrated in 1820. Stuccoed and white-painted without, it greatly resembles one of Wren's usual City Renaissance churches within. The east end of the church is remarkable—or was, for it is now in process of demolition—for a very effective altar-piece representing the Crucifixion, lighted from above.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

PRICES OF BOOKS.

Arundel, Sussex.—In reply to J. W. M., the published price of Mitchell's "Advanced Building Construction" is 5s. 6d., Mitchell's "Forty Plates on Building Construction" 10s. 6d., and of Stephenson's "Estimating" is 6s. 6d. These books are all published by Mr. B. T. Batsford of 94, High Holborn, W.C.

MENSURATION BOOKS.

Colchester.—Z. Y. X. writes: — "What books are published on mensuration; and which do you consider to be the best practical one for an architect's use?

Few architects require in their practice to know more of mensuration than is contained in the "Mensuration Rules" given in the "Surveyor" section of "Specification," on p. 65 of No. IV.; this is obtainable from these offices, price 5s. Todhunter's work on the subject might be consulted if anything further is needed. G. A. T. M.

SOUTH AFRICAN APPOINTMENTS.

Leicester.—J. J. writes:—"I shall be glad if you will kindly advise me as to how to obtain berths in South Africa. I am a builder's manager, and should like to get out there. Please also state any difficulties to an Englishman in that country. Of course, I mean when the present war is completed."

It is practically impossible to give a satisfactory reply to this query until the war is over, for matters which now have one aspect may then have a totally different one. J. J. had therefore better wait a little and see how events turn out.

MEASURING AND PRICING ARCHES.

Leeds. — A. McK. writes: — "Will you kindly give me the rule for measuring a brick arch the full thickness of wall for a warehouse? Should such an arch, say, rubbed and gauged elliptic or segmental axed, be measured on the internal face in addition to the external face and soffit, and, if so, should the internal face be paid for at the same rate as the remainder of the arch? I have several works on quantities, but none seem to define this point."

If the internal face is finished the same as the external, it should be measured and priced the same, but it is not usual to have gauged work on the interior of a warehouse.

HENRY ADAMS.

ALTERATION WORK.

Blackpool.—E. S. E. writes:—"In alterations the pilasters of a shop front are kept low in order to allow a through first-floor sill course. Contractor does not give sufficient projection in head, but otherwise works to drawings. The result is that the pilasters appear insignificant compared with those adjoining and the proprietor, without consulting as to cost, &c., orders new ones. He now says that he ought not to have to pay for them, as the fault lay originally with the architect and then with the contractor for making what he knew would not be satisfactory. Has the proprietor any right to expect concessions as to price from either the architect or the builder?"

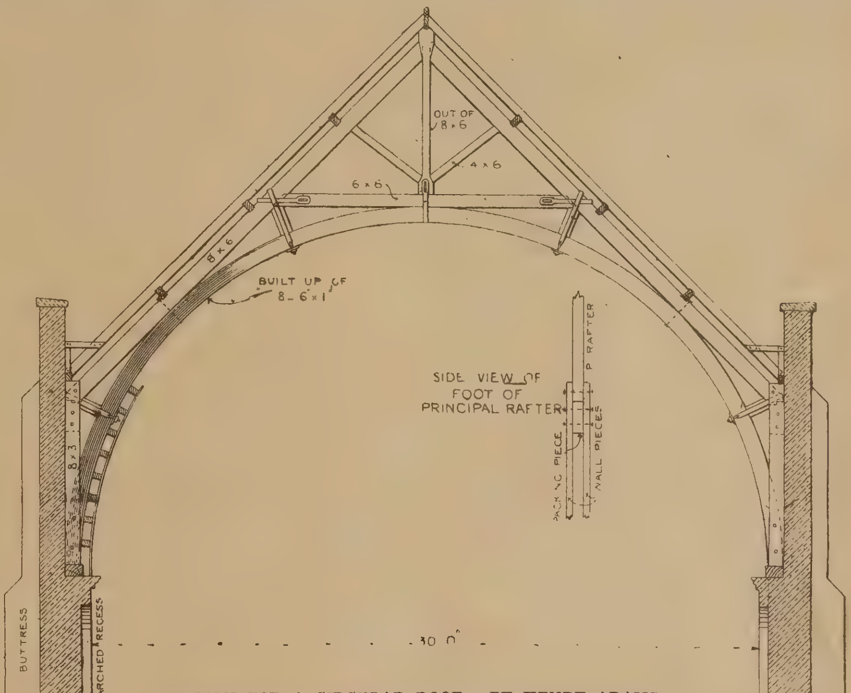
If the contractor failed to work to the drawings, and so caused the proportion in head to be insufficient, the proprietor has a right to expect concessions as to price from him, and from the architect who allowed the work to be improperly done. If the contractor worked to the drawings, he is in no way responsible; but the architect is, and the proprietor has a right to expect a concession in price from him. A. H.

DESIGN FOR CIRCULAR ROOF.

Birmingham.—E. M. writes: "I have a circular roof to construct, as shown in the sketch (not reproduced). Could you give me some particulars as to construction, and say what size timbers would be required? How are the required strengths worked out?"

The accompanying design is a suggestion to meet the case, but a right-angled roof with a cylindrical soffit, without tie rods at the springing, is not a very scientific arrangement, and the stresses are difficult to work out with any exactitude. The laminated circular rib should be built up in pieces bent to the curve, breaking joint and each screwed at fairly close intervals to its outer neighbour. A roof of this type will be found at page 60 of No. 2 "Specification," and in Plates XII., XV., and XVI. of Hurst's "Tredgold's Carpentry."

HENRY ADAMS.



DESIGN FOR A CIRCULAR ROOF. BY HENRY ADAMS.

SALARY OF LONDON BUILDER'S CLERK.

Bath.—Country writes: — "Would you kindly inform me what is the amount of salary per week of a London builder's general clerk of average capabilities? Also, what are the number of working hours per day?"

"Average capabilities" is too elastic a definition of the querist's qualifications to enable a reply to be very helpful to him. The pay of a builder's clerk in London is variable, ranging anywhere between £1 1s. to £3 3s. per week, the latter figure being reached only in the offices of large contracting firms, and then, usually, by reason of special capabilities in some special direction. As a general clerk in an office where but one (or at most two or three) is employed, from 30s. to 40s. per week would be about the rate, with working hours about ten per diem; and in return for the latter salary a clerk would be required to be tolerably expert at book-keeping, quick and capable at builders' arithmetic, neat and quick at tracing and able to turn out working drawings, accurate at taking off quantities and pricing bills and p.c. accounts, and able to measure up for and prepare estimates for repairs and alterations. In a large office, reasonable expertness in *one* branch would command as large a salary, with shorter hours (about eight per day) and a reasonable chance, if thoroughly expert, of attaining to and exceeding the higher figure mentioned. But it will probably be well within the mark to say that there are more London builders' clerks in receipt of a salary not exceeding 40s. per week than there are drawing a higher wage. H. E.

CONTRACTOR'S ALLOWANCE FOR CARRIAGE.

Blackpool.—W. S. K. writes:—"A contract for alterations in which terra-cotta is intended to be used is divided into two portions. The first only is carried out. No mention is made in the specifications of carriage, but they provisionally "allow the sum of £12 10s. for terra-cotta, add for profit and fixing" in the first part, and £10 10s. additional in the second portion. Materials being ordered for the whole scheme, the proprietor agrees to pay the extra ten guineas—or, rather, the exact cost, including carriage—but disputes liability for carriage on part of the work executed. Can the contractor claim for this? Terra-cotta was ordered by the architect and sent carriage forward to the builder, who has only been allowed the nett cost of it."

This question is very obscurely put; but, as well as I can understand it, the contractor is entitled to be allowed the cost of carriage of the terra-cotta, as well as the first cost to him, the two not to exceed £12 10s. A. H.

WHO KEEPS THE CONTRACT DRAWINGS?

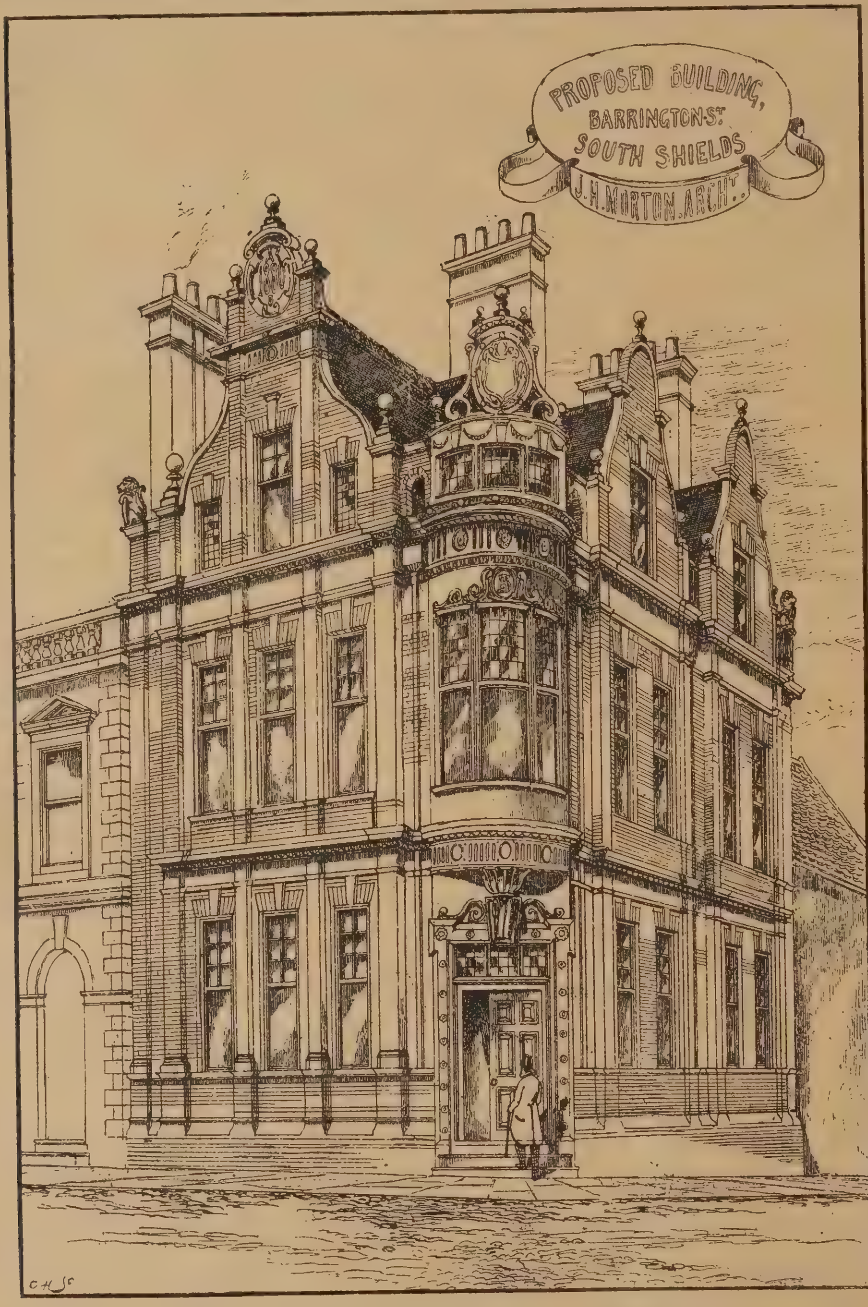
Bradford.—Specialist writes: "Can you advise as to any methods adopted by architects for securing possession of the contract drawings after works are completed? Our legal adviser informs us that the architect is not a party to the ordinary agreement between proprietor and contractor, and, consequently, any clause referring to the possession of the drawings is of no standing. He suggests a separate agreement in writing between the architect and the client, distinctly stating that the contract drawings shall remain the property of the architect at the completion of the works. This method of procedure does not recommend itself to us, being likely to cause friction."

The suggestion of your legal adviser is quite correct. There must be a distinct contract between the employer and the architect that the latter shall retain the drawings, as they are otherwise the property of the employer, who can demand their delivery as soon as he has paid the architect. A verbal contract would suffice; but a contract in writing would be the only safe one, as it would prevent any dispute afterwards. A. H.

Professional Practice.

Bristol.—Messrs. Wilkins and Son, the contractors for the Cheltenham Road Library, are making good progress with the building, which is expected to be ready by next October. The site is an excellent one, and the Corporation have secured sufficient land to give a good approach to the library. The design, by Mr. W. V. Gough, is in the Renaissance style of architecture and the building will be of Cattybrook brick with freestone dressings. The front elevation will be 65ft. wide and 38ft. to the parapet, while the building will extend back about 100ft. The front elevation will be divided into three bays and the entrance porch in the centre will be enriched with carved mouldings, surmounted by the city arms. The flanking bays will be provided with nine-light windows and the front will be finished with frieze, cornice, parapet and balustrades. An ornamental turret will rise from the centre of the roof. Separate entrances are provided for the public library and lending department, the latter being separated by a breast screen from the principal hall, which runs the whole length of the building. The North Bristol Library will probably be the best in the city and both in regard to situation and the increased facilities which the building will afford it will doubtless be much appreciated by those for whose benefit it has been designed. The total cost, including the purchase of the site and the leasehold interests involved, will be about £11,700.

Chorley.—A public library has, through the generosity of Mr. Herbert T. Parke, of Withnell Fold, been built in Avondale Road, from the designs of Messrs. Jolly and Buckley, of Dinsley. At the entrance there is a spacious vestibule and on going through the swing doors one enters the lending library apartment, well stocked with books. On the right of the lending library is the smoke room, a somewhat novel feature in a public library. Papers, &c., will be provided here. Next to the smoke room is the boys' reading room, a cosy apartment which will be supplied with boys' papers, &c., and in which the occupants can read books of fiction or other works which they have obtained from the lending library. To the left of the lending library is the reading room, one of the largest apartments in the building. Desks are provided for a number of newspapers and magazines, and other publications will be provided. In addition to the rooms mentioned, there is the reference library, which is reached by passing through the reading room. The librarian's office overlooks the lending library. The rooms are substantially furnished. The lending library will allow of shelving accommodation for about 16,000 volumes, and already there are between 5,000 and 6,000 books in this department. Towards the purchase of books and fittings the late Sir Henry Tate subscribed £500, and Mrs. Rylands has given £150. Mr. E. McKnight, formerly of the Wigan and Carlisle Public Libraries, is the librarian.


PROPOSED BUILDING,
BARRINGTON ST.
SOUTH SHIELDS
J. H. MORTON, ARCHT.

PROPOSED OFFICES IN BARRINGTON STREET, SOUTH SHIELDS.
J. H. MORTON, F.R.I.B.A., ARCHITECT.

London.—At the Greenwich County Court recently Mr. H. T. Bonner, architect, of Lewisham, claimed £62 and costs from Alfred Carter, tile merchant, of Brockley, for services rendered in the preparation of plans and specification for a building in 1897. Plaintiff deposed that he prepared, in accordance with instructions, plans and specification for the building. The amount of the lowest tender was £1,667 and his claim as recognised by professional usage was 4 per cent. on that amount. The increase in the cost originally mentioned by the defendant was due to defendant making alterations increasing the size of the cellarage and other extensions and additions to the original plan, the cost of which was not to exceed £1,100.—Evidence as to the recognised scale of professional fees having been given, defendant deposed that he engaged Mr. Bonner to draw up plans for a building which would cost about £1,000. Plaintiff said the work could not be done for that amount, but it would not exceed £1,100. Up to the time the tenders were received no one suggested that the work would cost more. When a plan estimated to cost £1,150 was submitted defendant suggested omissions which would reduce the amount to £1,100.—George F. Harrington, surveyor, said that he cubed the estimate at 8d. per cube; he considered that 2½ per cent. on the estimate would have been reasonable remuneration for plaintiff. Cross-examined:—Assuming his cubing was correct, the building as shown on the plans would cost £2,000.—Counsel for defence submitted that the plaintiff by exceeding his client's instructions had not complied with the terms of the bargain entered into at their first interview.—Counsel for plaintiff replied that when Mr. Bonner delivered the plans and estimate he had performed his portion of the work for which he had bargained.—His Honour gave judgment for the defendant with costs.

Manchester.—A new Board school—the thirty-second erected by the Manchester School Board—is being built in Moston Lane from the designs of Messrs. Royle and Bennett, architects, Cooper Street, Manchester. When completed it will accommodate 1,230 children (450 infants, 390 boys and 390 girls). The total probable cost, with the site, is estimated at £21,000. The site has an area of 8,700 square yards and there is ample accommodation for extension if this should become necessary in the future. The principal front of the school—which will be the longest Board school in Manchester—will face Moston Lane, and each department will have separate entrance and exit. The infants' department, which is to be on the ground floor, will comprise a hall 62ft. by 35ft. and eight classrooms, as well as a cloakroom and two good rooms for the principal and assistant teachers. Provision is also to be made upon this floor for an art schoolroom, manual instruction room, cookery room, laundry and storeroom. The boys' and girls' departments, on the upper floor, will each have a hall 50ft. by 35ft. (capable of being changed into one large hall, six classrooms, a cloakroom, and two teachers' rooms). The contractors for the work are Messrs. A. B. Bullivant and Sons.

South Shields.—The building in Barrington Street, South Shields, illustrated on this page, was designed for Mr. J. M. Moore, of South Shields, and consists of the necessary offices for the profession of a lawyer. The architect is Mr. J. H. Morton, F.R.I.B.A., South Shields.

New Companies.

Hareshaw Silica and Firebrick Co., Ltd.

This company has been registered in Scotland with a capital of £7,500 in 2,500 five per cent. cumulative preference and 5,000 ordinary shares, both of £1 each, to adopt an agreement with Thomas Gray, Alcathburn, Morningside, Newmains. Registered office: 83, West Regent Street, Glasgow.

W. Harris and Sons, Limited.

This company was registered on November 24th by A. Allistone, 25, Bedford-row, W.C., with a capital of £10,000 in £1 shares, to acquire the business carried on at 339—343, Edgware Road, W., by W. Harris, W. J. S. Harris and D. W. Harris as W. Harris and Sons, and to carry on the business of builders' merchants, &c. W. Harris (chairman), W. J. S. Harris and H. D. Harris are permanent directors. Qualification, 100 shares.

Maxwell, Lawrence and Co., Limited.

This company was registered on December 9th by Robert McGowen, 81, Dale Street, Liverpool, with a capital of £10,000 in £1 shares, to acquire any land and property, to erect buildings of any description, to construct and maintain roads, sewers, embankments, bridges, tramways and other works and conveniences, and to carry on the business of builders, contractors, decorators, stone and timber merchants, &c. The first directors (to number not less than five nor more than seven) are to be appointed by the subscribers. Qualification, £250. Remuneration as fixed by the company.

Sunderland Commercial Investment Company, Limited.

This company was registered on December 9th by G. W. Bain, 46, John Street, Sunderland, with a capital of £10,000 in £1 shares, to acquire any lands, buildings and other property in Great Britain, to lend and advance money to builders and others, to grant loans upon mortgage or other security, and to carry on the business of builders, contractors, miners, &c. The first directors (to number not less than three nor more than five) are W. Burns, G. Porteous, J. G. Kirtley and G. W. Bain. Qualification, £200. Registered office: 46, John Street, Sunderland.

Westralian Jarrah Forests, Limited.

This company was registered on November 30th by H. E. Warner, 10, Finsbury Circus, E.C., with a capital of £120,000 in £1 shares, to adopt and carry into effect an agreement to be made between a company bearing a similar title (registered July 6th, 1898), in liquidation, and T. Wigham, the liquidator thereof, of the first part and this company of the other part, for the acquisition of the business, undertaking, assets and liabilities thereof; to acquire certain timber estates in Australia, and to develop, deal with, work and turn to account the same in such manner as the company shall see fit; as timber growers and merchants, sawmill proprietors, and to carry on the business of miners, &c.; to develop the resources of land by planting, &c.; to construct and maintain gasworks, rail and tram roads, &c.; to equip and dispatch expeditions; as brick and tile makers, builders and contractors, dealers in precious stones, &c.; to acquire and turn to account any real or personal property; to acquire and turn to account any patents, patent rights, &c.; to carry on in all or any of their respective branches the businesses of shipowners, shipwrights, proprietors of graving or other docks, wharves, warehouses, &c., &c. The first directors (of whom there shall be not less than three nor more than seven) are Hon. H. Finch Hatton, G. P. Neele, M. J. Burlinson, W. Goff and R. Brown. Qualification, £250. Remuneration, £200 per annum each; chairman, £300, with a percentage of the profits, divisible. Registered office: 34 and 36, Gresham Street, E.C.

New Patents.

These patents are open to opposition until January 29th.

1898.—Acetylene Gas Generators.—24,501. W. Ellen, Manchester. The generators consist of cylinders provided with removable holders for the carbide. These holders have divisions. The generators are fixed obliquely to the side of the gas tank, and water is let into them near the bottom. The cock on the gas-supply pipe is connected with the cover of the generator by a link and handle, and the action of opening the cover shuts the cock—and *vice versâ*.

Fireproof Paints.—25,275. A. J. Boult, London (*P. Carré, Paris*). When the composition is used for impregnating such materials as curtains, canvases, papers, &c., it consists of water, 100 parts; boracic acid, 4 to 8 parts; sulphate, hydrochlorate or carbonate of ammonia, 15 to 50 parts (according to the nature of the material); and borax, 1 to 5 parts. This mixture is preferably used at a temperature of between 70deg. and 80deg. C. When it is used to colour as well as to fireproof it is used with a mixture of water 100 parts and hide glue 50 parts. When used as a paint, it is mixed with white lead or zinc white, and thinned with turps.

Locks.—25,730. P. Kossov, W. Wisehew, and P. Sofronow; all of St. Petersburg. The key consists of a flat steel blade perforated with holes diversely arranged and of different sizes. These engage with pins on cylinders and so enable the lock to be opened.

Packing Tiles and Bricks—25,943. J. Webb, Leeds. To prevent the glaze on bricks, tiles and similar goods becoming damaged during transit, paper is attached to the back surface with cement, passed over the face, and damped; it then stretches taut.

Smoke Consumers.—27,156. G. C. Leslie, London, S.E. Fixed in the chimney is a grid covered with loose asbestos. Underneath it are some gas burners, and around it may be a water jacket or boiler. The gas makes the asbestos incandescent, and by these means the unconsumed smoke that escapes from the fire is consumed, generating enough heat to raise steam in the boiler and so compensate for the cost of the maintenance of the apparatus.

Hot-water Regulators. — 27,228. W. Geipel and F. M. T. Lange, both of London, S.W. This invention is to enable an approximately constant temperature to be kept up in hot-water heating apparatus. At the top of the boiler a brass tube and an iron tube are provided, both being fixed at one end and being free to move at the other in order to impart motion to a cord connected with a controlling damper. The tubes form two sides of an isosceles triangle. The idea therefore is chiefly based on the different coefficients of expansion of the brass and iron.

1899.—Fireproofing Compositions.—345. H. Y. Simpson and the British Non-Flammable Wood Company, Ltd., both of London. Mixed with about 30oz. of zinc paint are, silicate powder, 2oz.; borax, 2oz.; phosphate of ammonia, 1oz.; and chloride of sodium, 1oz. Hydrate of aluminium may be substituted for the borax. Lead paint is recommended in preference to zinc paint, as it is more fire-resisting.

Oil-stone Boxes.—1,496. J. Whitehouse and J. G. Billings; both of Evesham. The box is made of tin and is turned up on the bottom to support the stone clear; it is also sufficiently wide to leave a space at each side of the stone. At one end abutments are provided and at the other a thumb-screw, by which the stone is held in place. The oil that is rubbed off does not get on to the table or bench, but falls into the bottom of the box, whence it can be easily removed.

Windows.—1,830. W. Fischer, Dortmund, Germany. The two lower sashes are arranged to slide into recesses in the wall on each side, and when this is done the upper light can be lowered down.

Electric Light Pendants.—1,941. H. Hirst and J. Murphy; both of London. From the ceiling rose extends a pivoted arm on which is mounted a pulley over which the flexible conductor passes, being counterbalanced in the usual way. By these means a radial as well as a vertical movement of the lamp is possible, increasing the area of illumination.

Air Pumps for Testing Purposes.—19,659. R. W. Boyd, London, W. At the back of the cylinder is an opening through which air is sucked in by the forward movement of the piston. At the other end are discharge valves. At the back also is fixed a box containing peppermint, &c., which disinfects the incoming air.

The following specifications were published on Saturday last, and are open to opposition until February 6th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.— 24,788, McDonald, lavatories. 24,789, McDonald, two-piece closets. 25,155, James, manufacture of artificial marble, granite, and the like. 25,203, J. Duckett and Son, Ltd., and Duckett, top-flushed slopwater closets. 25,297, Bucher, apparatus for generating acetylene gas. 25,335, Scotland, means for heating dwellings, halls, and the like. 25,548, Ruble, Adams and Iorns, apparatus for withdrawing shavings, dust and the like, and for ventilation. 26,488, Wilson, manufacture of incandescent gas burners.

1899.—666, MacKenzie, street lamps. 1,664, Boisselier and Laurent, manufacture of bricks, slabs, blocks, flagstones, and the like. 1,756, Davies and Earle, drying apparatus applicable for use in the manufacture of Portland cement and for analogous purposes. 1,828, Wilkes, Wilkes and Goodman, manufacture of the cases or bodies of locks and other like cases. 1,982, Wethered, locks and latches. 1,984, Garland, adjustable canopies of stove grates. 2,011, Nesbit and Ashwell and Nesbit, Limited, drying horses and similar apparatus. 2,013, Mathewson, sand blast apparatus. 2,128, Robinson, machines for making bricks, tiles, and the like. 2,392, Schneeweis, acetylene generators. 4,223, Berger, apparatus for generating acetylene gas. 16,266, Göttsch and Fehrs, hanging stages or scaffoldings. 16,275, Adshead, centre portion of metallic curbs and fenders. 17,339, Imray (*Soc. des Verreries de Bruxelles*), process for the total or partial hardening of glass. 17,343, Dauber, apparatus for making acetylene gas. 19,973, Whitehead, Harris and Sacre, cowls for the prevention of downdraughts, rain, and the like, in chimneys and ventilators. 20,518, Weill, process for the production of artificial marble. 20,883, von der Höh, door and other locks. 21,017, Thompson (*Piepmeyer and Karst*), apparatus for heating buildings and the like. 21,641, Rodda, device or contrivance for use in connection with drawing pencils and the like. 21,683, Boult (*Novotny and Mierisch*), apparatus for scouring and cleaning pipes and conduits. 21,699, Schmitz, process for manufacturing pipes. 21,746, Greger, manhole frames and covers.

COMING EVENTS.

Friday, December 29.

London Institution.—Mr. Alfred H. Fison, D.Sc., F.R.A.S., on "Light and Colour." 4 p.m.

Monday, January 1.

London Institution.—Mr. Alfred H. Fison, D.Sc., F.R.A.S., on "Colour Mixture and Colour Sensations." 4 p.m.

Thursday, January 4.

London Institution.—Mr. Alfred H. Fison, D.Sc., F.R.A.S., on "Photographs in Natural Colours." 4 p.m.

Provident Institution of Builders' Foremen and Clerks of Works.—Ordinary Meeting of members at 8 p.m.

Civil and Mechanical Engineers Society.—Mr. W. A. Francken, A.M.I.C.E., on "Well Foundations in India." 8 p.m.

Royal College of Art, South Kensington.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: XII.—The Upper Limb."

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 0 0
Sainfoin mixture	do.	3 15 0	4 5 0
Clover, best	do.	4 5 0	5 0 0
Beans	per qr.	1 8 6	—
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 5 8	—
Colza Oil, English ...	per cwt.	1 4 9	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 8 6	1 8 9
Linseed Oil	per cwt.	1 1 6	—
Petroleum, American ...	per gal.	0 0 6 3/8	0 0 6½
Do., Russian ...	per gal.	0 0 6 3/8	0 0 6½
Pitch	per barrel	0 8 6	—
Tallow, Town	per cwt.	1 4 6	1 8 9
Tar, Stockholm	per barrel	1 5 0	1 5 6
Turpentine	per cwt.	1 17 1½	1 17 3
Lead, white, ground, carbonate	per cwt.	1 3 0	1 4 0
Do. red	per cwt.	1 0 4½	—
Soda crystals	per ton	2 17 6	3 0 0
Shellac, orange	per cwt.	3 2 6	—

METALS.

Copper, sheet, strong ...	per ton	83 0 0	—
Iron, bar, Staffs. in London	do.	9 10 0	11 2 6
Do. Galvanised Corrugated sheet ...	do.	15 0 0	—
Lead, pig, Spanish ...	do.	16 7 6	16 10 0
Do. do. English common brands	do.	16 15 0	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	18 10 0	19 0 0
Do. pipe	do.	19 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	do.	9 15 0	10 15 0
Tin, Foreign	do.	103 5 0	103 15 0
Do. English ingots ...	do.	107 0 0	—
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	25 0 0	—
Do. Spelter	do.	20 7 6	20 12 6

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Do. Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	per bundle.	0 1 4½	0 1 5
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd.	do.	12 10 0	12 15 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	17 15 0	18 0 0
Do. do. 2nd „	do.	10 10 0	12 0 0
Do. do. Unsorted „	do.	10 15 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	8 0 0	16 10 0
Do. White Sea	do.	10 10 0	17 15 0
Do. Quebec Pine, 1st...	do.	19 5 0	24 10 0
Do. do. 2nd	do.	16 10 0	—
Do. do. 3rd &c.	do.	9 5 0	9 15 0
Do. Canadian Spruce, 1st	per P. Std.	11 15 0	—
Do. do. 3rd & 2nd	do.	9 0 0	9 5 0
Do. New Brunswick ..	do.	7 5 0	8 0 0
Battens, all kinds	do.	8 15 0	9 10 0
Flooring Boards, 1 in. prepared, 1st	per square	0 10 0	0 12 0
Do. 2nd...	do.	0 9 6	0 11 0
Do 3rd &c.	do.	0 9 3	—

HARD WOODS.

Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4½	—
Do. Honduras	do.	0 0 4 15/16	—
Do. Tobasco	do.	0 0 4 7/16	—
Elm, Quebec	per load	12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 3/16	—
Do. African ...	do.	0 0 4 9/32	—
Do. St. Domingo ...	do.	0 0 6¼	—
Do. Tobasco ...	do.	0 0 4 15/16	—
Do. Cuba ...	do.	0 0 9 27/32	—
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	10 0	16 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ..	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 9	0 3 5

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17¼×3×2	8 10	8 1	14 6
17¼×3×1½	6 9	6	10 9

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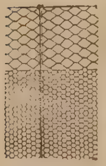

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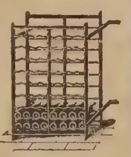

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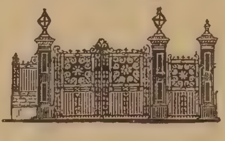

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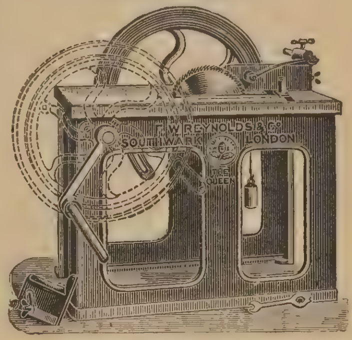

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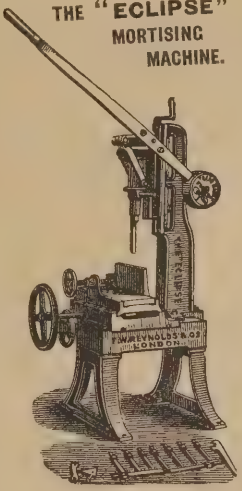

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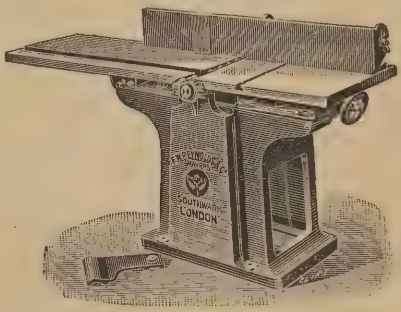

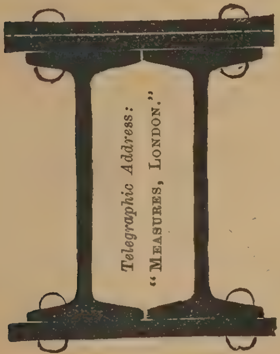

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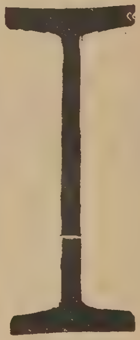

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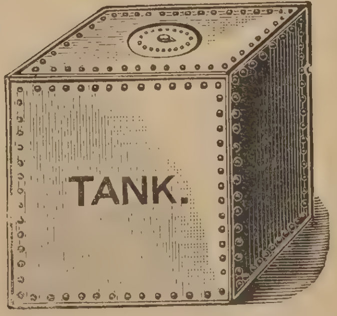

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TENDERS.

BARRY (Glam.).—For the erection of hospital and appurtenant buildings, &c., for the Urban District Council. Mr. J. C. Pardoe, C.E., Council Offices, Barry:—

G. Rutter	£9,102	9	0	Davies & Profit	£8,275	0	0
D. Davies	9,022	0	0	Richards and Evans...	7,972	0	0
Lattey and Co....	8,978	0	0	Jones Bros.... ...	7,960	0	0
W. Brillon	8,550	0	0	J. Prout	7,940	0	0
Lloyd and Tape	8,318	0	0	A. Richards... ...	7,915	0	0
Evans Bros. ...	8,300	18	4				

[Whole matter deferred.]

BURTON-ON-TRENT.—Accepted for the erection of Artisans' Dwellings at Horninglow, for the Burton-on-Trent Artisans' Dwellings Co., Limited. Mr. Thomas Jenkins, architect, 35, High-street, Burton-on-Trent:—

No. 3 Contract.

Henry Edwards £10,950

LONDON.—For re-arranging and re-fitting offices, all departments; alterations to urinals; new sparge pipes; re-fitting teachers' offices on ground and second floors: removing babies' offices and boys' teachers' water-closets, and soil-pipe on the ground floor mezzanine; and providing a new drainage scheme at Crampton-street School, for the London School Board. Mr. T. J. Bailey, architect:—

Lawrance & Sons	£3.845	0	0	W. Downs	£2,920	0	0
Munday & Sons	3,720	0	0	J. and C. Bowyer	2,842	0	0
Stimpson & Co.	3,400	0	0	Johnson and Co.	2,756	0	0
W. Hammond ...	3,047	0	0	Killingback and Co.	2,736	7	7
Martin, Wells, & Co.	3,022	0	0	Akers and Co. ...	2,661	0	0
Lathey Bros. ...	2,997	0	0	Edwards & Medway *	2,368	0	0
Whitehead and Co., Ltd.	2,975	0	0				

* Accepted.

LONDON.—For room for science instructor, metal-work room, manual training centre for forty boys, cookery centre, laundry centre, with a playground on the roof for girls; and enclosing, draining, and tar-paving the additional land on Divisional Office site (Blackheath-road), for the London School Board. Mr. T. J. Bailey, architect:—

Bulled and Co.	£5,486	J. and C. Bowyer ...	£4,929
Garrett and Son	5,280	Johnson and Co., Ltd.	4,832
Edwards and Medway	5,141	Smith and Son, Ltd....	4,805
Kirk and Randall ...	5,100	E. Triggs...	4,800
F. and H. F. Higgs ...	5,067	J. Marsland*	4,683
White and Co.	5,047		

* Accepted.

LONDON.—For the erection of staff home, laundry, workshops, &c., at the infirmary, Fulham-road, West Brompton, for the Guardians of St. George's Union. Mr. E. T. Hall, architect, 57, Moorgate-street, E.C.:—

Charles Wall	£82,360	£1,400†
C. Gray Hill	78,778	1,350†
Henry Lovatt	76,890	1,100†
B. E. Nightingale	76,785	—
Shillitoe and Sons	76,625	1,000†
Foster and Dicksee, Rugby*...	73,949	550†
Hockley and Son	71,490	2,200†

* Accepted. † Extra for Portland Stone.

LONDON.—For alterations and additions to the Armoury and adjoining premises, St. Thomas's-street, Southwark. Mr. H. Phelps Drew, architect, 33, King-street, Covent Garden, W.C. Quantities by Mr. J. Rookwood, 26, Bedford-row, W.C.:—

Snewin Bros. and Co.	£4,592	F. G. Minter	£3,700
Simpson and Son. ...	4,250	H. J. Williams	3,693
Killby and Gayford ...	3,995	W. Norton, Chelsea*...	3,450
Patman and Fotheringham	3,790		

* Accepted.

LONDON.—For enlargement, infants' department, 100, with additional cloak room and lavatories, at Neckinger-road School, for the London School Board. Mr. T. J. Bailey, architect:

Bulled and Co.	£1,938	White and Co.	£1,525
Wagstaff and Sons ...	1,676	J. Marsland	1,495
Stimpson and Co. ...	1,674	J. Appleby *	1,438
J. and C. Bowyer ...	1,593		

* Accepted.

LUDLOW.—New water supply, Moor Park Estate, for the Hon. Lucius O'Brien. J. Fletcher Trew, C.E.:—

Meredith	£1,979	1	3	Beaven, Gloucester†	£773	1	0
Scull Bros.	1,788	12	4	Blundell, Gloucester†...	808	9	1
Vale	1,788	12	2				
Law	1,750	0	0				
Bryan, Ludlow*	1,639	18	3				

* Accepted. † Pipe laying only.

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Tenders, endorsed "Grimsby Workhouse," to be delivered to the Clerk to the Guardians, J. F. WINTRINGHAM, Esq., St. Mary's-chambers, Great Grimsby, on or before JANUARY 15th, 1900.

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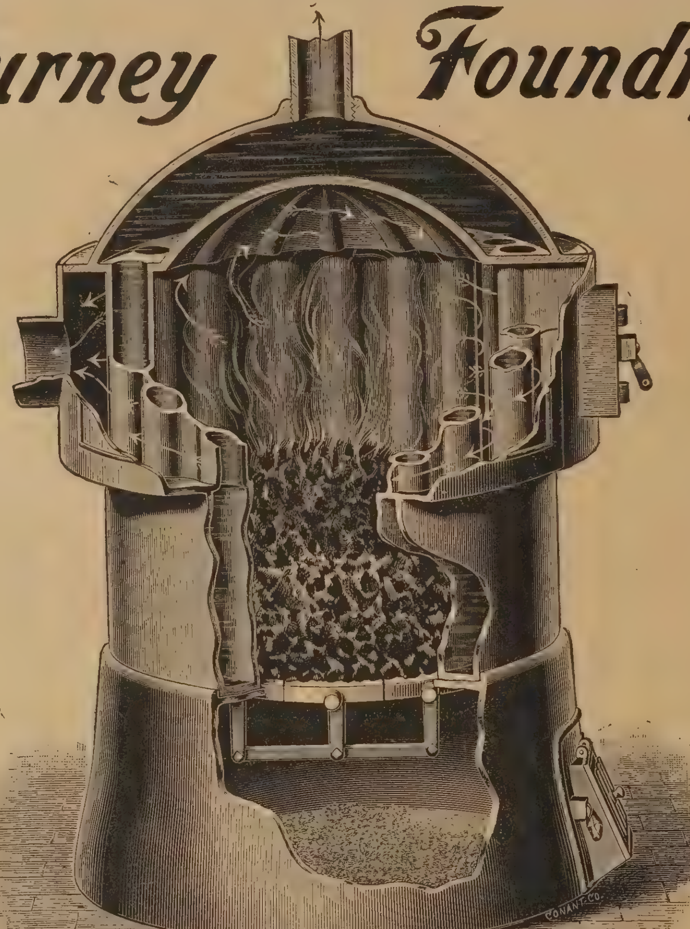

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SEWAGE PURIFICATION WITHOUT FILTRATION.

By W. KAYE PARRY, M.A., A.M.I.C.E.

NINE years ago Dr. Adeney claimed that sewage could be purified by developing the micro-organisms contained in the liquid itself, and he asserted that this could be accomplished by the addition of small quantities of oxygen carrying chemicals to the sewage. Prior to that time no chemist had put forward such a method as practicable. It is true that Dr. Dupré had suggested that the solution of the sewage problem might be found by the preparation of a special culture to be added to the sewage, but the utilization and development of the organisms in the liquid itself as the direct agents of purification was an absolute novelty. Others had, indeed, shown that the beneficial effect of land treatment was due to biological action, but that this same result could be obtained in the body of the liquid without land and without filters of any kind was a new departure. In these days we have become familiar with the action of bacteria, and everyone knows that given suitable conditions they are the best, nay, the only agencies upon which we can rely for the reduction and oxidation of organic matter. Nine years ago, men spoke learnedly about "occluded oxygen" as the active agent in certain filtering materials, and the direct oxidising action of atmospheric oxygen was looked upon as the active principle in the breaking down of the organic matter.

From the very outset of his work, Dr. Adeney expressed the opinion that the results were accomplished not by the direct action of atmospheric oxygen, but by the organisms whose activity was promoted by a sufficient supply of oxygen, and he stated that it would be more economical to supply them with oxygen by means of a suitable chemical compound than to endeavour to utilise atmospheric oxygen itself. He was also led to believe as a matter of economy that it would be cheaper to separate the insoluble organic matter in the first instance by means of some suitable precipitant, so as to reduce the work of the organisms and to enable them to concentrate their energies on the organic matter in solution. Further researches supplied him with a precipatating material which was in itself an oxygen carrier, so that when it was mixed with the body of the sludge it supplied oxygen to the organisms, who performed the work of destruction in the precipitated solids. The organisms thus fully provided with the necessary stimulus to their life processes effect the reduction and oxidation without setting up putrefaction or causing the evolution of noxious gases.

Thus, while the organic matter in the liquid is rendered harmless and inodorous, the solids are subjected to the same action. Sludge is formed, no doubt, but sludge which is absolutely unlike any other sewage sludge, and which presents no difficulties as regards disposal. It need not be pressed because it is always sweet, and it can be exposed and dried without the faintest trace of smell. It dries rapidly down to a small percentage of moisture, and can be handled and carted like garden mould, which it closely resembles; it has also proved to be a really useful manure. Briefly, then, the result of nine years' work is to show that liquids containing organic matter in solution can be purified without filters and without land, and that wet sludge containing organic matter can be handled, dried, and utilised without danger, without offence, and without machinery. These statements are being verified day by day, wherever Dr. Adeney's principles have been intelligently applied.

Meanwhile, many other alternative methods for utilising the beneficent action of micro-organisms have received considerable attention. Mr. Dibdin proposes to dispense with all preliminary tanks and chemicals and to subject the crude sewage itself to the direct action of the bacteria, through the instrumentality of artificial filters, relying solely on the aërobic organisms to effect the result. Mr. Cameron claims that it is more advantageous to pass the sewage in the first instance through a closed tank, in which he contends that the anaërobic organisms effect the necessary preliminary changes which render the liquid more amenable to the filtration, which is the final stage of his process. In both cases, however, it is claimed that no chemicals are used and no sludge is formed.

For the purpose of this paper it is not necessary to discuss the arguments or the evidence by which either of these claims is supported. Let us for the moment assume sewage may be treated successfully in either of the three ways which have been mentioned. The controversy will then resolve itself into a mere question of relative cost. At the meeting of the Sanitary Institute at Birmingham, the writer pointed out that additional evidence was still needed to show which was the most economical method. Artificial filters and large tanks involve considerable capital expenditure, and the life of a filter has still to be ascertained.

From the calculations which the writer has made, based upon the most recent estimates of the cost of bacterial filters, he has come to the conclusion that a process which includes the use of chemicals and the production of sludge may compare favourably with a really efficient purification plant which involves the construction and maintenance of artificial filters. But before passing away from the sludge controversy it is well to bear in mind that in every million gallons of average town sewage there is one ton of mineral matter in suspension, which the living organisms in the liquid are powerless either to liquify or to annihilate. If this mineral matter be intercepted in suitable tanks or catch pits, it will represent ten tons of wet sludge containing ninety per cent. of moisture for every million gallons treated.

In the face of this fact, how can it be seriously asserted that by the use of biological filters there will be no sludge. It is not possible to separate the mineral matter in suspension from the heavier part of the organic matter, some of which must remain in the catch pits or tanks designed to intercept the mineral matter and road detritus. The presence of organic substances will not only give rise to putrefaction, but will add to the bulk of the wet sludge to be handled and disposed of. If on the other hand the crude sewage be allowed to flow on to the filters without sedimentation, the mineral matter will be left in the filters, and as it is finely divided it will fill up the voids, and eventually choke up the filters.

One other consideration is worthy of attention. At Sutton not only is there a catch pit to intercept the heavier road detritus, but there is a very perfect and most efficient mechanical screening machine, which separates a large percentage of the fæcal matter, and almost all the paper. The sewage comes down to the works very fresh, so much so, that neither the fæces nor the paper have had time to dissolve and a large part of the organic matter never finds its way to the filters at all.

The writer himself is satisfied that in every system of sewage treatment there must be some residuum, which if it be not removed will sooner or later clog any filters; whereas if it be removed it constitutes sludge which must be handled and disposed of, and the great charm of the bacterial filter and of the septic tank disappears. It would appear to be preferable to face the cost and inconvenience of some preliminary treatment for the purpose of separating the solids day by day, rather than to run the risk of filling up the voids in the filters, as the periodical renewal of the filtering material will entail a serious charge on the rates. Should experience prove that after all some preliminary treatment is an alsolute necessity in dealing with town sewage and that filtration can only be successfully adopted after some such treatment, then it can easily be shown that the annual charge consequent upon the construction of artificial filters will represent a very much heavier burden than the application of Dr. Adeney's principles for dealing with the solids in solution. From his own observations the author is convinced that notwithstanding the Barking experiments it will be found in practice that for the purpose of obtaining a good effluent by filtration of a previously clarified sewage, it is necessary to provide two acres of artificial filters for every million gallons of liquid treated per day.

The cost of artificial filters under the most favourable circumstances will never be less than £2,000 per acre and will often greatly exceed this amount; but even at this rate the interest and sinking fund will amount to £200 per annum per million gallons. This is equal in round figures to a rate of 11s. per million gallons filtered, without allowing anything at all for labour or for purchase of land. From these figures it would seem that we are not likely to materially reduce the cost of sewage treatment by the adoption of biological filters.

In support of this last proposition, the writer will conclude by citing Mr. Baldwin Latham's figures as to the probable cost of artificial filters for Manchester, which he estimates at £300,000. Taking interest and sinking fund together at 5 per cent., this outlay would represent a charge of £15,000 a year for the construction alone (or £1 11s. 7d. per million gallons filtered), without allowing anything for land purchase, working expenses and renewals; whereas the cost of purchasing and applying a suitable oxygen carrying compound to the clarified sewage of Manchester, which s calculated at 26,000,000 gallons a day, would not amount to more than one third of this sum.

PUBLIC SLAUGHTER-HOUSES FOR RURAL DISTRICTS.

By R. SYDNEY MARSDEN, M.B., D.Sc., F.R.S

I TAKE it that the desirability of substituting public slaughter-houses in place of private ones in our urban districts is now universally admitted by all who are in any way conversant with the subject and I therefore do not require to go into the pros and cons of this part of the subject; but with regard to their provision in rural districts, there may be differences of opinion. Personally, I consider that public slaughter-houses in rural districts ought to be provided. You can never get proper control or efficient inspection of your meat supply without them. What is the existing state of things? In the great majority of country districts the inspector of meat is the general inspector of nuisances, whose time is fully taken up with the ordinary sanitary work, and as a general rule he knows absolutely nothing about the diseases of meat.

The Medical Officer of Health is very often a half-timer, whose knowledge of meat really consists of his pathological training as a medical man, and who generally has not any special knowledge in meat inspection. He is only called in when the inspector drops upon a flagrant case or has made a mistake, and does not know quite where he stands; the outcome very often is loss of prestige to the reputation of both, and the result is that there is not very zealous attention paid to this particular portion of the official duties and in large portions of the country there is practically no inspection whatever. The result of this is that the little slaughter-houses dotted about all over the country in different villages, are in many cases excellent centres for bad and affected meat (after being tampered with, stripped, and dealt with in every possible way so as to hide the disease) to be sent into the markets and into the towns (if it can be got in) by every way and bye-way, and the final result of it is that, in spite of the strictest inspection in the town abattoirs, a great many towns are suffering from this poisoned traffic coming in from the country, where there is no inspection whatever.

I do not see how, if you do not grapple with that particular branch of the question, any amount of true inspection in the towns is to give you more than a limited protection, and I think the matter is one which calls for immediate attention. I have long thought that if district centres were formed (on much the same lines as combined districts for fever hospital purposes) where the slaughtering must take place, and a properly qualified man is district meat inspector to supervise that particular section, practically the immunity which a town now possesses would be obtained. I would make central abattoirs in the centre of the various districts, and abolish private slaughter-houses entirely throughout the country.

But, it will be said, would not this imply either an immense number of these abattoirs in country districts or the sending of the meat very long distances? I do not think so. Nearly all country districts are arranged around some particular centre which is the focus of the whole place. Take postal districts, for instance, they all centre in the most convenient village of the districts they serve; and it is there that I would put the public abattoir for the district. Of course this would necessitate the butchers coming from the adjacent villages to kill and fetch back their meat, which in some instances, would mean travelling two, three or even as much as five or six miles, but the same distance would have to be travelled in many of our large towns, such as Liverpool, Manchester and Birmingham from the outlying districts to the public abattoirs, especially if the abattoirs were placed at one end of the borough. Distance, however, does not count for much in the country once a man has started in his cart, if he could carry the meat two or three miles, he could without much more difficulty carry it five or even six. What I mean is that in country districts you do not think much of a mile or two, more or less, nor of anything within reasonable distance.

Every man who has been a country medical practitioner knows this quite well; he knows that there is a certain radius around his particular centre which can be conveniently served and worked, and that the distance of a mile, more or less, is not accounted very much of a difficulty when once he has got started. The country doctor knows pretty well which is the most convenient centre for working a district, and you will generally find that it corresponds fairly closely with the postal centre. I see no great difficulty therefore in making such a centre the one for a public slaughter house.

But I shall be told that would imply an enormous number of abattoirs throughout the country? Yes, but there are an enormous number of private slaughter-houses throughout the country, which are all to my mind centres which cannot be, and are not, inspected, and which, generally, are not conducted on very sanitary grounds in any way.

A great deal of questionable and diseased meat is killed in some of these places, and is sent into the market and into the towns, and in this way frustrates, to a large extent, the objects of meat inspection in the urban districts. You cannot get proper inspection of meat until you have got rural as well as urban public abattoirs under the supervision of specially qualified meat inspectors, well acquainted with the trade. Such inspectors ought, in my opinion, to be appointed by the County Councils, and work under the direction of the County Medical Officers of Health. This would relieve them and the District Medical Officers of Health from the local influences which must necessarily bear upon them, if such officers were held under district councils; and it is most desirable that officials having to perform unpleasant duties of this kind should be removed as far as possible from such local influences. I am therefore strongly of the opinion that rural public abattoirs are practicable and desirable, and that it is only by the institution of such places in both urban and rural districts that any really efficient inspection of the meat supply of the country can be obtained.

The two foregoing papers were read before the Annual Congress of the Sanitary Institute, held at Southampton, on August 29th, 30th, and 31st last.

Wood-paving in Charterhouse Street, which connects Holborn Circus with the Smithfield Market, has just replaced the granite setts it was formerly paved with.

CHICAGO DRAINAGE CANAL.

A WORK THAT WILL COST £6,000,000.

THE New Year will see the opening of one of the greatest, if not the greatest, piece of sanitary engineering ever executed—the Chicago drainage canal. The work is an important one, because it provides for the sewerage of a city—or, to speak more accurately, of a sanitary district—with a population of one million and a half, but its chief interest lies in the fact that it boldly achieves this object by tapping Lake Michigan and pouring part of the waters of the great lakes down into the Mississippi.

The site of Chicago, says a correspondent of the Aberdeen "Daily Free Press," would have been a bad one for a village, to say nothing of a town, for it was originally a marsh on the shores of Lake Michigan. The tall buildings of Chicago are founded on networks of piles driven into the treacherous soil, and it was not so long ago that the notice "No bottom here" was frequently seen on the tracks which are now busy thoroughfares. Through this dead level the Chicago river finds its way to the lake. It would be inaccurate to say it is little better than a sewer. It is worse, because it is uncovered. The sewage of Chicago is discharged into it at all points and, as the current of the stream at ordinary seasons is not strong enough to scour it out properly, the waters simply stagnate and breed fever right in the heart of the city. A good flow, however, would make the plight of Chicago worse than ever. As it is, the river is carrying the sewage far enough out into the lake to pollute the famous tunnels from which the city's water supply is drawn. The pass to which things have come may be gathered from the bulletin which the municipal authorities issue every day, advising the public of the purity or impurity of the water pumped through the different cribs. It was to purify the Chicago river and to protect the city's water supply from pollution, that the drainage canal was undertaken.

What Chicago has done has been to cut a trench, 22ft. deep, so as to make its river flow into the Des Plaines river instead of into Lake Michigan.

The new canal extends from a point on the Chicago river six miles from its mouth, but only two miles as the crow flies from the lake, to Lockport, where it discharges into the Des Plaines river. The distance is slightly over twenty-eight miles. But why, it may be asked, make a cut of twenty-eight miles when the watershed is only eight miles away? The explanation is easy. Had the junction been made between the Chicago river and the Des Plaines river at their point of nearest approach, the latter would have been as likely to flow east as the former to flow west. The condition imposed by the State Legislature when it sanctioned the scheme was that there should be a flow down the canal of 300,000 cubic feet per minute. This was, of course, to secure the proper dilution of the sewage, and it was provided that the flow should be increased by 20,000 cubic feet for every 100,000 added to the population of the district. To insure this flow by gravitation it was necessary to cut the trench not merely across the watershed but to a point some twenty miles down the other side, there being a fall of only 6ft. in the total distance of twenty-eight miles. This, however, owing to the level character of the ground, was not such a serious task as might be expected. As a matter of fact, the deepest cutting on the whole canal is only 50ft., or 28ft. to the surface of the water. The first thirteen miles of the channel are through glacial drift. The lower fifteen miles are through solid limestone rock, and so neatly has the excavation been done that one would imagine it to be the work of some gigantic grooving machine.

As may be supposed, the contractors for the work displayed all the usual American ingenuity in devising labour-saving appliances, but no machines did better service than the rock-drillers. A short piece of track was laid down in the line in which it was proposed to cut the canal. On this a steam driller moved backwards and forwards, gradually cutting out a groove about 7ft. deep. A similar machine was at work on the other side of the canal and at the same time ordinary tripod drillers bored a row of shot holes between the grooves. When the blast was fired, the whole section was dislodged without shattering the adjacent rock. The operation was repeated with two lower decks of rock, as they might be called, and the canal, 22ft. deep, was left with sides as clear cut as quay walls. During a single month, the contractor for one of the sections excavated 86,000 cubic yards of solid rock, an achievement which is claimed to be without precedent. The width of the channel at the bottom varies from 110ft. in earth to 160ft. in rock, the dimensions of the rock portion of the cutting being sufficient for a population of three millions. The flow in the earth part of the channel will, as occasion requires, be increased by dredging. It is calculated that the earth and rock excavated during the work would, if deposited in the lake in 40ft. of water, make an island one mile square, with its surface 12ft. above the water-line.

At Lockport, where the canal opens into the Des Plaines river, an immense controlling dam has been built. The level of Lake Michigan varies according to the direction in which the wind is blowing. These fluctuations will be felt at the controlling works, and the dam, with its sluice gates, has been built to a height several feet above the lake level, so as to absolutely control any abnormal flow of water from that direction. Through the sluices the waters of the canal will pass into the Des Plaines and in order that the sewage-laden stream may be properly "aerated" and exposed to the bacteriological action of the sunlight, a wide extent of haugh or "interval land," as it is called in Chicago, has been purchased just below the dam. The water will spread itself over this flat area and then without any further effort being made at purification, will continue its course down to the Mississippi. Actual work on the channel was commenced in the autumn of 1892. The total cost will be 33½ million dollars, or, roughly speaking, over six million pounds sterling. The Suez Canal, 66 miles long, took nine years to construct, and cost twenty millions sterling; the Manchester Canal, 35 miles long, took six years, and cost fifteen millions; and the North Sea Canal, 61 miles long, took eight years, and cost seven millions.

The opposition to the scheme has been keen and determined. Towns lower down the Mississippi—such, for instance, as St. Louis, which draws its drinking water from that source—naturally object to their river being made a receptacle for Chicago's sewage, and, though it is now too late to kill the canal, considerable obstacles, based on technical grounds, might be put in the way of its completion. Were the water once in the canal the promoters would feel safe, because possession is nine points of the law and because they believe that actual demonstration will confute the critics. That is why the Sanitary Board is straining every nerve to finish the work and why it hopes to get the channel into operation by January. Officially, the channel has been always described as a ship and drainage canal. Chicago is ambitious and there are doubtlessthose who honestly regard the work about to be opened as the first instalment of a great undertaking which is one day to make their city the commercial metropolis of America. In their dreams they see the argosies of the Western Continent floating to their gates from the south as from the east, but for the present at any rate they will be content if the canal serves the prosaic purpose of draining Chicago.

Swansea Electric Lighting.—The electric lighting committee of the Swansea Corporation have decided to recommend the acceptance of the tender of Messrs. Gates and Tom for boilers, steam piping, &c., at £10,800. It has also been decided to oppose the Bill of the South Wales Electrical Power Distribution Company, some particulars of which were given on page cxxxiii. of the supplement to the BUILDERS' JOURNAL for November 29th last.

COMBINED REFUSE DESTRUCTORS AND POWER PLANTS.

A PAPER with this title was read by Mr. C. Newton Russell, Assoc.M.Inst.C.E., at a meeting of the Institution of Civil Engineers on December 12th, dealing with the subject of refuse destruction, particularly in reference to its employment for raising steam. The results obtained from eight combined plants in England and two abroad were given, the data of which all tended to prove that a considerable amount of energy in the form of heat was to be obtained from the burning of ordinary domestic refuse. The Shoreditch plant was dealt with in considerable detail, as being the largest of its kind in operation.

The total amount of refuse destroyed at Shoreditch during a period of twelve months was about 26,000 tons, of which 92 per cent. was ordinary domestic refuse and 8 per cent. trade refuse, consisting of straw, paper, &c. The latter was practically useless for steam raising. The plant consisted of six Babcock-Willcox water-tube boilers and twelve refuse-furnaces of the Manlove-Alliot type, each boiler being placed between two refuse-furnaces, the hot gases from which were led into the boiler-tubes through short side-flues, each boiler being provided with a special grate, on which coal might be burned if required. The average amount of refuse received per day was eighty-four tons, delivered between 9 a.m. and 5 p.m., although as much as 140 tons had been received in one day. It appeared to be impossible in ordinary working to guarantee a regular supply, and it was advisable to provide means of storage to cope with extra large deliveries. This difficulty was met by means of a large rectangular iron storage-bin fixed under the tipping platform and holding about sixty tons of refuse. Forced-air draught was supplied to the fires by electrically-driven fans, the pressure in the ashpits being 1in. of water. No coal or other fuel was mixed with the refuse, which burnt freely; the maximum temperature observed being 2,500deg. Fahr., and the average, 1,500deg. Fahr. The clinker residue amounted to 32 per cent. The works were managed on the eight-hour shift system, seven days per week.

The steam generated in the boilers, at an average pressure of 140lb. per square inch, was consumed mainly by the engines attached to the electric generators, although a small portion of live steam was supplied for clothes-washing purposes to the public baths and washhouses adjoining the electricity works; exhaust steam was also supplied to the baths and free library, which were entirely heated from the steam raised by the refuse-destructor.

The average cost of burning the refuse during the second year of working, including four furnace men, two top men and one charge man, supervision clerks, &c., cleaners and yard men, repairs, stores and sundries, was 2s. 6·9d. per ton. The amount of electric energy absorbed in dealing with the refuse, including electric fans, lifts, trucks and lighting, was 4·98 Board of Trade units per ton per annum. A number of evaporative tests had been taken with the result that with one boiler and two refuse-furnaces it was possible, by the burning of ordinary refuse, to evaporate 2,888lb. of water per hour, from and at 212deg. Fahr.

The average calorific value of various tests was 0·99lb. of water per lb. of refuse. The heating surface of each boiler was 1,300 square feet, the refuse grate area was 25 square feet, and the coal grate area was 27 square feet. The total amount of energy sold by meter to consumers was 1,031,348 Board of Trade units, including 131,140 units supplied to the refuse destructor. The total amount of refuse burnt was 26,201 tons and of coal consumed 1,344 tons (value £1,308 14s. 8d.). The item of cost per ton for interest and redemption of land and plant—not usually considered in connection with refuse destructors—was a matter for serious consideration, and in the case of the Shoreditch destructor plant—where land is very expensive—the charge worked out at practically 1s. per ton.

Builders' Notes.

Housing of the Working Classes.—At last week's meeting of the London County Council the following amended recommendation of the Housing of the Working Classes Committee was agreed to:—"(a) That it is desirable that an amendment of the Housing of the Working Classes Act, 1890, should be obtained, so as to empower the Council to acquire land outside the County of London for the erection of working class dwellings. (b) That the Housing of the Working Classes Committee be authorised to appoint a deputation to wait upon the Secretary of State for the purpose of urging him to introduce a Bill in the next Session of Parliament for the amendment of the Housing of the Working Classes Act, 1890, so as to empower the Council to acquire land outside the County of London, for the erection of working class dwellings, and that it be referred to the Committee to consider and report whether the special provisions of the Act as to the compensation payable in respect of property taken within unhealthy areas can be equitably amended, so as to reduce the heavy cost of clearance schemes to the ratepayers, and to compel the owners of insanitary property to bear the whole cost of re-housing the persons displaced on such areas."

A Plymouth Party Wall.—The case of Bishop v. Sweet came before the last sitting of the Plymouth County Court. Plaintiff is the owner of No. 6, Chapel Street, and defendant of premises adjoining. The wall separating the premises was a party wall. In January, 1899, a portion of the wall was in a condition necessitating repair and the plaintiff repaired the wall at a cost of £4 17s. 2d. Defendant refused to contribute to the cost of the repairs and the plaintiff claimed half the cost, £2 8s. 7d. His Honour, Judge Woodfall, said the law seemed somewhat involved, but, as far as he could arrive at a conclusion, a tenant in common was under no obligation to contribute to the repairs to common property unless an obligation arose with reference to a third person. If this wall were a source of danger to third persons, the owners of it would be under a liability to keep it in such a state that it should not be a danger. That was not so in this case and he could find no other obligation which would compel the defendant, if she willed otherwise, to contribute to the repair of common property. Tenants in common, if they could not agree as to what was to be done, had a remedy in equity; but it seemed to him there was no obligation, expressed or implied, in this case, and there must therefore be judgment for defendant.

The New London Government Act.—The Hon. Everard Fielding, an Assistant Commissioner under this Act, opened a public inquiry last week at the Hackney Town Hall for the purpose of altering and adjusting such areas and boundaries of the new borough of Hackney as might be found expedient. Mr. B. Browne, Q.C., said the agreement come to with Bow and Shoreditch had been to the gain of the latter and the loss of Hackney. In dealing with Islington he felt Hackney was entitled to compensation, as Islington had gained through the agreement with Shoreditch. The proposal Hackney put was to resign rateable value on the eastern side of the proposed boundary, amounting to £6,806, and to take property on the northern side from Islington of the rateable value of £8,329. This left a balance of £1,520 to the gain of Hackney, which was only just, considering the sacrifice made to Shoreditch, by which Islington derived benefit. Evidence was given and the Assistant Commissioner said he would make his report.—Some interesting points were introduced into the inquiry held by Mr. C. Dill at the Clerkenwell Town Hall relative to East and Central Finsbury. With regard to the parish of Glasshouse Yard, Mr. R. Griffiths submitted that it was in the City boundaries, because it was under the jurisdiction of the City Sewers. But Mr. Gomm, statistical officer of the London County Council, said that Glasshouse Yard was in the Parliamentary borough of Finsbury and the fact of its being drained by the City Sewers was only what might be termed a domestic arrangement of convenience; it in no way transferred it to the City.—At the Hampstead Vestry, Mr. J. W. Thompson held an inquiry as to the future boundaries of Hampstead. The Marylebone Vestry propounded a scheme by which Hampstead would give up St. John's Wood Park and part of Avenue Road in exchange for property adjoining Primrose Hill, which would bring the Hampstead boundary down to Regent's Park. Mr. Stringer, for Marylebone, contended that this latter property ought to belong to Hampstead, as it was practically detached from Marylebone and it would give a simpler boundary. Mr. A. P. Johnson, for Hampstead, objected on the ground that the proposed alteration would affect too many householders. Mr. Thompson announced that he would report on the matter to the Commissioners.—It will be seen from the foregoing that the settling of the boundaries of the various districts will entail much trouble and difficulty.

A Large Housing Scheme.—The Housing of the Working Classes Committee of the London County Council intend, shortly after the Christmas recess, to ask the sanction of the Council to a large scheme for housing the poor in the neighbourhood of Tooting. The site of the proposed new buildings is known as the Totterdown Fields site and consists of about 38½ acres. The purchase price is agreed at the rate of £1,150 an acre, so that the total amount will be about £44,500. The site is close to the terminus of the Council's tramways and the other means of access are stated to be good. The cottages which it is proposed to erect on the site will be constructed so as to provide for two families each. They will each consist of two self-contained tenements, one of two and one of three rooms. Separate gardens will be provided for each tenement, and, on an average, not less than thirty cottages will be built to the acre. The rent of the tenements should average about 7s. 6d. per week. It is not anticipated that any charge on the rates will be involved by the erection of the cottages. As the Council is at present obliged to repay the cost of the land and buildings in sixty years, it is upon this basis that all the calculations will be made. The committee are unable at present to state precisely the cost per cottage, but it is probable that the total cost of land, roads and buildings will be about £500,000.

London County Council Works Department.—The Finance Committee of the London County Council has just issued the half-yearly return of works executed by the works department. The returns relate to estimated and jobbing works completed during the half-year ended September 30th. During that period fourteen estimated works were completed and certified. The cost of these works has been £23,376. Only three of them show an unfavourable result and in only one case, that of the erection of Wargrave Buildings on the Boundary Street area, can the excess cost be regarded as serious. In eleven cases the works have been executed at a total saving on the estimates of £1,713. The net result, however, owing mainly to the excess on Wargrave Buildings, is that the saving on final estimates for the half-year is only £587. At the end of the return is a statement showing the totals of the actual cost and of the final estimates of all works executed by the department since its creation in November 1892. From this it appears that works estimated to cost £838,642 have actually cost £883,232, thus showing a loss of £44,590. The loss shown during the existence of the Works Committee and previous to the reorganisation of the department as the result of the special inquiry was £54,954, but since then there has been a saving of £10,364. On the jobbing works which have been carried out since 1895, when the schedule of prices came into operation, there has been a total balance of cost below schedule value, or a saving of £8,624.

Compensation Case at Doncaster.—At the Doncaster County Court, before Judge Masterman, an application was recently made on behalf of Patrick Corley, labourer, for an arbitration under the Workmen's Compensation Act, 1897. The respondents were Messrs. Walter Scott and Co., of Goldthorpe, near Rotherham, contractors. The grounds of the application were that on September 22nd, 1899, at Bolton-on-Dearne, the applicant sustained an accident whilst engaged in taking a sprag from the wheel of a steam navvy, when his right hand was caught between the sprag and a block of wood. As the result of the accident the palm of applicant's right hand was badly cut and he lost half of his first finger and the whole of his second and third fingers on the right hand. At the time of the accident his wages were 23s. per week. The claim was for 11s. 6d. per week, being 50 per cent. of his wages, or the maximum sum recoverable by the Act. The respondents admitted liability and submitted to an order for payment of 11s. 6d. per week from the date of the accident until Saturday, December 16th, by way of payment for total incapacity, and a sum of 11s. 6d. per week from that Saturday forward during partial incapacity, or until the same shall be ended, diminished, increased, or agreed in accordance with the Workmen's Compensation Act. The judge made an award on the terms asked for with costs.

Masters and Men.

The Aberdeen Building Trades, which have enjoyed so long and so remarkable a period of prosperity, are at present somewhat dull. The number of plans of new buildings brought before the Town Council in recent months has not been quite up to the average, and it is well known in the building trades that a considerable number of plans which duly received sanction are not likely to be carried into effect—at least for some little time to come. An element operating towards this result has been the recent rise in the price of money, and the difficulty of finding money at a sufficiently cheap rate to enable the various parties to proceed with building operations. Another reason is, doubtless, the fact that, in certain quarters of the city at least, the number of new houses provided has exceeded the demand. At the present time, in consequence, an unusually large number of operatives connected with the building trades, but building masons especially, are idle in Aberdeen. This is not wholly due, however, to depression in Aberdeen. A very considerable number of masons have been driven home from South Africa by the war, and these have swollen the ranks of the home unemployed to a considerable extent. It is understood to be the intention of these men to return to South Africa when matters there have been brought to a settlement, presumably in the spring, but meantime their presence in the city accentuates the otherwise very distinct impression of dullness in the trade. It was to be expected that the present condition of things would have some effect on wages. In the joiner trade a movement in that way has already taken place. Formal notice has been served by the employers that, owing to the slackness of trade, a reduction of a halfpenny per hour will take place in the wages. Three months' notice is necessary under the by-laws of the trade, so that the change would take effect between two and three months hence. The notice is at present under the consideration of the various operative organisations. No definite step in this direction has yet been taken in connection with the mason branch of the building trades, although the matter is being considerably talked about privately.

The Workman's Progress.—Mr. G. H. Wood, in a paper read before the Statistical Society last week, endeavoured to arrive at a new estimate of the real progress of the working classes during the last generation. His estimate was based not alone on a consideration of the wages they earn, or of their wage-earning capacity as measured by the amount of employment they obtain, but on the purchasing power of their wages. The computation of the wages themselves was the least difficult part of Mr. Wood's task. He showed that in spite of a serious drop after the year 1874, when wages, after being 40 per cent. higher than at the beginning of the period considered, dropped 13 per cent., yet at the end of the period considered they were in 1896 almost at the 1874 level. One might say that they were, in fact, 40 per cent. higher than in 1860. But there was another consideration: and that was the quantity of employment, which is subject to sudden large drops owing to trade depressions, and must be subject to occasional temporary drops owing to the introduction of machinery into a particular trade. The amount of employment per man was about the same; it was certainly not more regular, and seemingly less so. The third important consideration was the purchasing power of the workman's wages. Measuring this by his consumption of commodities (wheat stuffs, meat, tea, coffee, beer, spirits, tobacco, cotton, wool, sugar, &c.), an enormous increase was to be found, amounting to about 45 or 50 per cent. However, this 45 or 50 per cent. increase in the consumption of commodities by the workman was only about half the real advantage he might have been expected to gain from the real increase in the purchasing power of money, which has nearly doubled. Mr. Wood's general conclusion was that, although there has been a real advance in the standard of living during the generation, yet only in the last ten years have the signs of progress equalled those which culminated in the high tide of prosperity in 1875. He also pointed out that, according to the law of periodic inflation and depression, our period of prosperity was now nearly at an end, and there were some signs that it was to be followed by a period of stagnation—as after 1875.

Surveying and Sanitary Notes.

Euston Station is proposed to be extended so as to front on Euston Square. A Bill will be promoted in Parliament next session.

New Water Scheme for Shrewsbury.—At the last meeting of the Shrewsbury Town Council a report was presented by the Water Committee relative to a scheme prepared by Messrs. Taylor, Sons and Santo Crimp, of London. The gathering ground is situated at Batchcott, on the Shrewsbury side of the Stretton Hills. Its area is 2,040 acres and the supply is to be sufficient for a population of 35,000, at thirty gallons per head per day. The water would flow by gravitation from a capacious storage reservoir to filter beds at Bayston Hill, and then on to the town, three miles away. The estimated cost is £155,000. It was decided to submit the matter to the Finance Committee.

Sewerage and Paving at Gainsborough.—Some time ago the Urban District Council of Gainsborough adopted a scheme for the repairing of certain streets at the estimated cost of £4,800; but the Local Government Board withheld sanction pending receipt of information as to the condition of the sewers, gas and water pipes in the streets in question. In his first report, dealing with the district embracing the streets to be repaved, the Council surveyor (Mr. H. Riley) states that the sewerage system of the Urban District consists of ten distinct drainage areas, each having its own outfall, where the crude untreated sewage is discharged direct into the River Trent. He found the sewers to be in a much better condition than he anticipated; but points out that should a heavy and prolonged rainfall occur at a time when the river is high, the main sewers become choked and the storm water issues from the gully grates in the streets. In one instance this was undoubtedly owing to the surface water from the Great Central Railway and the new cemetery, which are higher than the town. The surveyor remarks that, although the Rivers Pollution Prevention Act does not require the purification of sewage discharged into tidal waters, he is of opinion that some day the law will compel the adoption of a more modern system. Whilst, however, he does not seek to justify the present primitive method of sewage disposal, he mentions that it is simple and convenient, and there is no reason to fear immediate evils arising from it. As to the repaving of the streets in question, he states that the scheme has been in hand since 1897, but mainly owing to circumstances over which the Council have had no control, a start has not yet been made, notwithstanding that complaints are received almost daily of the very bad condition of the streets.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—		
Dec. 29	Richmond—Alterations, &c., to Laundry ...	Joint Isolation Hospital Committee ...	F. C. Greville-Smith, 172, High-street, Hounslow.
„ 29	Walthamstow—Bandstand ...	Urban District Council ...	G. W. Holmes, Engineer and Surveyor to the Council.
„ 29	Bramley (Leeds)—Houses ...	....	William Shackleton, 2, Somerset-road, Pudsey.
„ 29	Carlisle—Works ...	Jos. Tiffen ...	H. H Hodgkinson, Scotch-street, Carlisle.
„ 29	Kendal—Shelter ...	Town Council ...	R. Hampton Clucas, C.E., Borough Surveyor, Town Hall.
„ 30	Newcastle-upon-Tyne — Offices and Pupil Teachers' Centre	School Board ...	W. H. Knowles, 37, Grainger-street, Newcastle-upon-Tyne
„ 30	Aberystwyth (Wales)—Villa ...	T. Owen, Esq. ...	J. A. Jones, 7, Queen's-terrace, Aberystwyth.
„ 30	Devonport—Demolition ...	....	Borough Electrical Engineer, Technical Schools, Devonport
„ 30	Embleton—Renovation ...	Mrs. Benson ...	R. Thompson, Paradise, Embleton.
„ 30	Thrapston (Northants)—Infirmary ...	Guardians ...	Blackwell and Thompson, Parkstile-chambers, Ketterin
Jan. 1	Carndonagh, Ireland—Station Buildings ...	Londonderry and Lough Swilly Rly. Co.	Offices of Company.
„ 1	Morcambe—Villa Residence and Stables ...	Mrs. Emary ...	A. L. Lang, 12A, Pedder-street, Morcambe.
„ 1	Belper—Enlarging Fleet Boys' School ...	School Board ...	Hunter and Woodhouse, Architects, Belper.
„ 1	Thrapston (Northants) Additions to Woodford House...	....	W. Plevins, Woodford House, near Thrapston.
„ 2	Ashton-under-Lyne—Shops ...	....	George and Son, Old Square, Ashton-under-Lyne.
„ 2	Bromley, Kent—Convenience...	Urban District Council ...	Council's Surveyor's Office.
„ 2	Glasgow—Extensions to Whitevale Depot ...	Corporation ...	J. Young, 88, Renfield-street, Glasgow.
„ 2	Oldham—Baths ...	Corporation ...	S. A. Pickering, Borough Surveyor, Town Hall.
„ 2	Sheffield—Settling Tank ...	United Gaslight Company ...	J. W. Morrison, Company's Office, Commercial-st., Sheffield.
„ 3	Cilybebyll, near Pontardawe—Isolation Hospital ...	Pontardawe Hospital Committee ...	J. Morgan, Surveyor, Herbert-chambers, Pontardawe.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—*Continued.*		
Jan. 3	London, S.E.—Execution of certain Works	Metropolitan Asylums Board	Office of the Board, Norfolk House, Norfolk-st., Strand, W.C
,, 4	West Hampstead, N.W.—Branch Public Library	St. John's Vestry, Hampstead	A. P. Johnson, Clerk, Vestry Hall, Haverstock-hill, N.W.
,, 4	Bridlington Quay—Houses	A. G. W. Wright	J. Earnshaw, M.S.A., Carlton House, Bridlington Quay.
,, 4	Chapel-Saint-Leonards—Rebuilding	....	D. Crows, Farmer, Chapel-St.-Leonards.
,, 5	Whitley, Northumberland—Council Offices, Fire Brigade House and Stores.	Urban District Council	J. P. Spencer, 13, Grainger-st. West, Newcastle-on-Tyne.
,, 6	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
,, 6	Birmingham—Alterations to Coachman's House	Guardians	W. H. Ward, Paradise-street, Birmingham.
,, 8	Eastbourne—Bandstand	Pleasure Grounds Committee	R. M. Gloyne, Borough Engineer, Town Hall.
,, 8	Oswestry—Market Extension	Town Council...	E. W. Lacey, Borough Engineer, Guildhall, Oswestry.
,, 9	Liversedge, Yorks.—Schools	School Board ...	A. E. Rhodes, Cemetery-road, Heckmondwike.
,, 9	Llangollen—Alterations to Court House	....	County Surveyor, Denbigh.
,, 10	Preston—Erection of Post-office	H.M. Office of Works	The Office of Works.
,, 10	Heamoor, Cornwall—Additions to School	Madron School Board	O. Caldwell, F.R.I.B.A., Penzance.
,, 13	~~Kilkeel (Ireland)—Masonic Hall~~	....	R. B. Wray, Kilmorey Arms Hotel, Kilkeel.
,, 15	Grimsby—Workhouse Extension	Guardians	H. C. Scaping, Court Chambers, Great Grimsby.
,, 16	Birkenhead—Electricity Generating Station	County Borough	C. Brownridge, Engineer, Town Hall.
,, 16	Chadderton (near Oldham)—Police Station	Standing Joint Committee	H. Littler, Architect, County Offices, Preston.
,, 26	St. Pancras—Baths and Washhouses	Vestry ...	T. W. Aldwinckle, 1, Victoria-street, S.W.
,, 29	Sunderland—School	School Board...	Office of Board, 15, John-street, Sunderland.
No Date.	Denby Grange, near Wakefield—Coke Ovens	....	F. W. Waterhouse, Denby Grange Collieries, near Wakefield.
,,	Hunslet, Leeds—Houses	Mr. J. Hollings	W. M. Coggill, Beach Grove, Stourton.
,,	New Shoreham, Sussex—Releading or Slating	....	F. C. Pilmore, 3, Western-road, New Shoreham.
,,	Prittlewell, Southend-on-Sea—Hotel	Mr. J. Berry ...	Greenhalgh and Brockbank, Bank-chas., Southend-on-Sea.
	ENGINEERING—		
Dec. 29	Twickenham—Machinery, &c., at Hospital	Joint Isolation Hospital Committee	F. C. Greville-Smith, 172, High-street, Hounslow.
,, 30	~~Panama—Aqueduct~~	Authorities	Commercial Department, Foreign Office, Whitehall, S.W.
,, 30	Manchester—Electric Tramcar Bodies	Tramways Committee of Corporation	J. M. M'Elroy, Tramway Department, Town Hall.
,, 31	Mistretta—Electric Lighting Town	Municipality ...	Commercial Department, Foreign Office, S.W.
Jan. 2	Llanelly—Reservoir	Urban District Council	H. W. Spowart, Clerk, Town Hall, Llanelly.
,, 2	London, N.E.—Accumulators	Hackney Vestry	R. Hammond, 64, Victoria-street, Westminster, S.W.
,, 2	London, E.C.—Locomotives	Secretary of State for India in Council.	Director General of Stores, India Office, Whitehall.
,, 2	Sheffield—Conveyors	United Gaslight Company...	J. W. Morrison, Co.'s Office, Commercial-st., Sheffield.
,, 3	Concepcion—Drainage and Waterworks	Chilian Government	Commercial Department, Foreign Office, Whitehall, S.W.
,, 3	Littlehampton—Esplanade Works	Urban District Council	H. Howard, Surveyor, Town Offices, Littlehampton.
,, 4	Ceylon—Railway	Government ...	Crown Agents for the Colonies, Downing-street, London.
,, 5	Bedford—Electric Lighting Plant	....	T. S. Porter, Town Clerk, Town Hall, Bedford.
,, 6	Glasgow—Electric Traction	Corporation Tramways	J. Young, 88, Renfield-street.
,, 6	Calne, Wilts.—Waterworks	Town Council...	W. H. Stanley, Market-house-chambers, Trowbridge.
,, 6	Roscommon, Ireland—Reservoir, &c.	District Council	C. Mulvany, M.I.C.E., Roscommon.
,, 8	Abingdon—Reservoir	Rural District Council	G. Winship, Borough Buildings, Abingdon.
,, 8	Abergavenny—Waterworks	Rural District Council	J. Gill, Surveyor, Merthyr-road, Abergavenny.
,, 8	Clacton-on-Sea—Gasholder	Urban District Council	S. Francis, Engineer, Town Hall, Clacton-on-Sea.
,, 9	Barnes—Electric Lighting Plant	Urban District Council	Surveyor, Council Office, High-street, Mortlake.
,, 9	Glasgow—Dash Wheels	Corporation ...	P. Fyfe, 23, Montrose-street, Glasgow.
,, 13	London, S.E.—Dust Destructor	Bermondsey Vestry...	Town Hall, Spa-road, Bermondsey.
,, 15	Carmarthen—Bridge	Rural District Council	Rowland Browne, 7, Hall-street, Carmarthen.
,, 16	Newcastle-on-Tyne—Generator	New Tramways Committee	C. Hopkinson, 29, Princess-street, Manchester.
,, 19	Pluck's Gutter, near Ramsgate—Bridge	....	W. A. Valon, Hardres-street, Ramsgate.
,, 20	Ilford—Electric Lighting Plant	Urban District Council	J. W. Benton, Council Offices, Ilford.
,, 20	Oban—Extension of Railway Quay	Callander and Oban Railway Co.	T. M. Barr, Engineer, Northern Division, Caledonian Railway, Perth.
,, 22	Glasgow—Machinery	Corporation ...	D. Home-Morton, 95, Bath-street, Glasgow.
,, 26	Valetta, Malta—Waterway in Tunnel at Sea-level	....	Superintendent of Public Works, Valetta.
No date.	Torrington, Devon—Retort Stack	Gas Company...	Manager, Torrington Gas Co., Torrington, Devon.
	IRON AND STEEL—		
Dec. 29	Walthamstow—Railings	Urban District Council	G. W. Holmes, Town Hall, Walthamstow.
,, 29	London, E.C.—Rails	Burma Railways Co...	Offices, 76, Gresham House, Old Broad-street, E.C.
,, 29	Navy Contracts—Iron Blocks, &c.	Admiralty	Contract Department, Admiralty, Whitehall, S.W.
,, 30	Donington, Lincs.—Fencing, &c.	Parish Council	A. G. Fletcher, Clerk to Council, Donington.
,, 30	Halifax—Stores	Waterworks Committee	J. A. Paskin, Engineer, Town Hall, Halifax.
Jan. 1	London, E.C.—Receivers	Corporation of Trinity House	Trinity House, E.C.
,, 1	Dublin—Stores	United Tramways Company	9, Upper Sackville-street, Dublin.
,, 3	Saltash—Pipes	Urban District Council	R. H. Worth, 42, St. George's-street, Plymouth.
,, 6	Roscommon, Ireland—Water Mains	District Council	C. Mulvaney, Engineer, Roscommon.
,, 6	Calne, Wilts.—Pipes	Town Council...	W. H. Stanley, Market House-chambers, Trowbridge.
	PAINTING AND PLUMBING—		
Dec. 30	Keighley—Painting	Corporation	J. Whitley, Temple-buildings, Keighley.
Jan. 6	Cardiff—Painting at Workhouse	Guardians	A. J. Harris, Clerk, Queen's-chambers, Cardiff.
	ROADS AND CARTAGE—		
Dec. 30	London, W.—Works and Materials	St. George's Vestry, Hanover-square	G. Livingstone, 1, Pimlico-road, W.
,, 30	Whitley, Northumberland—Works	Urban District Council	Council Offices.
,, 30	Aylesbury—Flints	Bucks County Council	R. J. Thomas, County Hall, Aylesbury.
,, 30	Ibstock (Market Bosworth)—Paving	Rural District Council	W. Thorpe, Nailstone, Nuneaton.
,, 30	Redcar—Improving Works	Urban District Council	J. Howcraft, 2, West-terrace, Redcar.
Jan. 1	Hastings—Road Metal	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
,, 2	Aldershot—Works and Materials	Urban District Council	N. F. Dennis, Surveyor, Aldershot.
,, 2	Southampton—Granite	Corporation	W. B. G. Bennett, Borough Engineer.
,, 3	Litherland, Lancs.—Sewering and Completing	Urban District Council	W. B. Garton, 25, Sefton-road, Litherland.
,, 3	Annan (Scotland)—Road Metal	Commissioners	A. Tweedie, Burgh Surveyor.
,, 3	Birkenhead—Flagging, &c.	Corporation	C. Brownridge, Engineer, Town Hall, Birkenhead.
,, 3	Erdington (Birmingham)—Road Works	Urban District Council	H. H. Humphries, Engineer, Public Hall, Erdington.
,, 3	Leith (Scotland)—Paving	Magistrates and Council	Burgh Surveyor's Office, Town Hall.
,, 6	Halifax—Paving	Highways Committees	E. R. S. Escott, Engineer, Town Hall, Halifax.
,, 8	Croydon—Granite	Guardians	H. List, Union Offices, Mayday-road, Thornton Heath.
,, 19	Monkton and Stourmouth (Ramsgate)—Road	....	L. W. Hogbin, Surveyor, Birchington.
No date.	Cockermouth—Road Metal	Rural District Council	J. B. Wilson, Court-buildings, Cockermouth.
	SANITARY—		
Jan. 1	Pembroke—Sewerage Works	Town Council...	Beesley, Son and Nichols, 11, Victoria-street, Westminster.
,, 1	Hastings—Sewers	Corporation	P. H. Palmer, Borough Engineer.
,, 3	Chester-le-Street—Sewers	Rural District Council	J. H. Mole, Surveyor, Council Offices, Chester-le-Street.
,, 6	Cheltenham—Sewer	Corporation	Surveyor, Municipal Offices, Cheltenham.
,, 8	Waterford—Sewerage Works	....	Waterford District Asylum Office.
,, 18	Kirkby-in-Ashfield—Sewerage Works	Urban District Council	H. Silcock, 14, Westgate, Mansfield.
No date.	Hampton—Sewer Connections	....	G. O. Ballard, Auctioneer, Hampton Hill.
	TIMBER—		
Jan. 1	Bristol—Wood Paving Blocks	Sanitary Committee	T. H. Yabbicom, City Engineer.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan. 31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.
Feb. 28	Doncaster—Isolation Hospital	£25, £15	F. E. Nicholson, Solicitor, Union Offices, Doncaster.
Mar. 12	Belfast—Assembly Hall	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast.

Property and Land Sales.

FREEHOLD BUILDING LAND to be LET on LEASE, or SOLD in PLOTS; fronting on main road, and close to golf links and Highgate Woods; near Muswell Hill and East Finchley Stations. Liberal advances if required to responsible Builders.—For plans and particulars apply to Mr. George H. Paine, Architect and Surveyor, 6, Stoke Newington Road, N. 6

HARROW-ON-THE-HILL.—Three acres of eligible Lands abutting on main road, laid out for small villa or cottage residences, five minutes from town and schools and proposed railway station, TO BE LET on Building Lease, or FREEHOLD will be sold. —For terms and particulars apply to Bentwich Watkin Williams and Gray, Solicitors, Corporation-chambers, Guildhall-yard, E.C.

Sales by Auction for the Year 1900.—Messrs.

DEBENHAM, TEWSON, FARMER, and BRIDGEWATER beg to announce that their SALES for 1900 of ESTATES, Investments, Town, Suburban, and Country Houses, Business Premises, Building Land, Ground-rents, Advowsons, Reversions, Stocks, Shares, and other Properties will be held at the Auction Mart, Tokenhouse-yard, near the Bank of England, in the City of London, as follows:—

Tuesday, January 16th
Tuesday, January 30th
Tuesday, February 13th
Tuesday, February 20th
Tuesday, February 27th
Tuesday, March 6th
Tuesday, March 13th
Tuesday, March 20th
Tuesday, March 27th
Tuesday, April 3rd
Tuesday, April 10th
Tuesday, April 24th
Tuesday, May 1st
Tuesday, May 8th
Tuesday, May 15th
Tuesday, May 22nd
Tuesday, May 29th
Tuesday, June 12th
Tuesday, June 19th
Thursday, June 21th
Tuesday, June 26th
Thursday, June 28th
Tuesday, July 3rd
Thursday, July 5th
Tuesday, July 10th
Thursday, July 12th
Tuesday, July 17th
Thursday, July 19th
Tuesday, July 24th
Thursday, July 26th
Tuesday, July 31st
Tuesday, August 14th
Tuesday, October 9th
Tuesday, October 23rd
Tuesday, October 30th
Tuesday, November 13th
Tuesday, November 20th
Tuesday, December 4th

By arrangement, Auctions can also be held on other days in town or country. Messrs. Debenham, Tewson, Farmer, and Bridgewater undertake Sales and Valuations for Probate and other purposes of Furniture, Pictures, Farming Stock, Timber, &c.

Detailed Lists of Investments, Estates, Sporting Quarters, Residences, Shops, and Business Premises to be Let or Sold by private contract are published on the 1st of each month, and can be obtained of Messrs. Debenham, Tewson, Farmer, and Bridgewater, Estate Agents, Surveyors, and Valuers, 80, Cheapside, London, E.C. Telephone No. 503, Bank.

SALE DAYS for the Year 1900.
Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, January 11th
Thursday, January 25th
Thursday, February 8th
Thursday, February 22nd
Thursday, March 8th
Thursday, March 22nd
Thursday, April 5th
Thursday, April 26th
Thursday, May 10th
Thursday, May 24th
Thursday, June 7th
Thursday, June 21st
Thursday, June 28th
Thursday, July 5th
Thursday, July 12th
Thursday, July 19th
Thursday, July 26th
Thursday, August 2nd
Thursday, August 9th
Thursday, September 27th
Thursday, October 11th
Thursday, October 25th
Thursday, November 8th
Thursday, November 22nd
Thursday, December 6th
Thursday, December 13th

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

HAMMERSMITH-ROAD, W.—Important Building Site.—Preliminary Notice of Sale by Auction.—Messrs.

CHESTERTON and SONS are instructed to SELL by AUCTION at the Mart, E.C., on THURSDAY, JANUARY 25th, 1900, at TWO o'clock, the valuable FREEHOLD PROPERTIES, Nos. 92, 98, 100, 102, 104, 106, 108, Hammersmith-road, together with Forty-seven Cottages and the Black Horse Beerhouse, in Brook Green-place at the rear, the whole forming an excellent building site of over 1¼ acres. Also the valuable FREEHOLD INVESTMENT, No. 46, Brook-green.

Particulars of Solicitors, Messrs. Miller, Smith, and Bell, 3, Salter's Hall-court, Cannon-street, E.C.; Messrs. Hasties, 65, Lincoln's Inn-fields, W.C; H. P. Smallpiece, Esq., Guildford; Messrs. Shore and King, Birmingham; E. F. Day, Esq., Nos. 5 and 6, Clement's-inn, W.C.; and Messrs. Crowders and Vizard, 55, Lincoln's Inn-fields, W.C. Auctioneers' Offices, 51, Cheapside, E.C., and 140, Kensington High-street, W.

PRACTICAL BOOKS
FOR
PRACTICAL MEN.

Acoustics of Buildings (Smith)	1s. 6d.
Architect's Guide (Rogers)	3s. 6d.
Brickcutting and Setting (Hammond)	1s. 6d.
Builder's Price Book, 1899 (Lockwood)	4s. 0d.
Building Construction (Allen)	7s. 6d.
Cabinet Maker's Guide (Bitmead)	3s. 6d.
Carpenter's Guide (Nicholson)	21s. 0d.
Carpentry (Tredgold and Tarn)	25s. 0d.
Civil Architecture (Chambers)	21s. 0d.
Coachbuilding (Burgess)	2s. 6d.
Concrete and Its Uses (Sutcliffe)	7s. 6d.
Drainage of Buildings, &c. (Clark)	4s. 6d.
Electric Light (Knight)	1s. 0d.
Electric Light Fitting (Urquhart)	5s. 0d.
Elementary Decoration (Facey)	2s. 0d.
French Polisher and Enameller	1s. 6d.
Gasfitting (Black)	2s. 6d.
Geometry for Builders (Tarn)	9s. 0d.
Grammar of Colouring (Davidson)	3s. 0d.
Handrailing (Goldthorp)	3s. 6d.
Hints to Architects (Guillaume)	3s. 6d.
Measuring and Valuing Artificer's Works (Dobson and Tarn)	7s. 6d.
Mechanics of Architecture (Tarn)	7s. 6d.
Modern Alphabets (Delamotte)	2s. 6d.
Masonry and Stonecutting (Dobson)	2s. 6d.
Mediæval Alphabets and Initials	4s. 0d.
Ornamental Alphabets (Delamotte)	2s. 6d.
Organ Building (Dickson)	2s. 6d.
Practical Surveying (Usill)	7s. 6d.
Pumps and Pumping (Bale)	2s. 6d.
Roof Carpentry (Collings)	2s. 0d.
Rural Water Supply	5s. 0d.
Saw Mills (Bale)	10s. 6d.
Specifications for Architecture	15s. 0d.
Superficial Measurement (Hawkings)	3s. 6d.
Surveying (Baker and Dixon)	2s. 0d.
Tables for Mechanics (Smith)	1s. 6d.
Timber Merchant's Guide (Grandy)	2s. 0d.
Woodcarving, with plates	2s. 0d.
Woodworking Machinery (Bale)	9s. 0d.
Ventilation of Buildings (Buchan)	3s. 6d.

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7, STATIONERS'-HALL COURT, E.C.
[B 100.]

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MODELS.
For Exhibitions or Law Cases.
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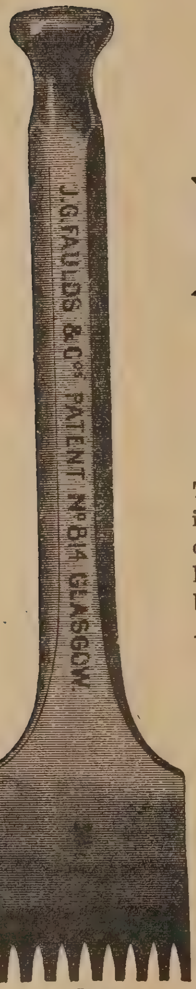
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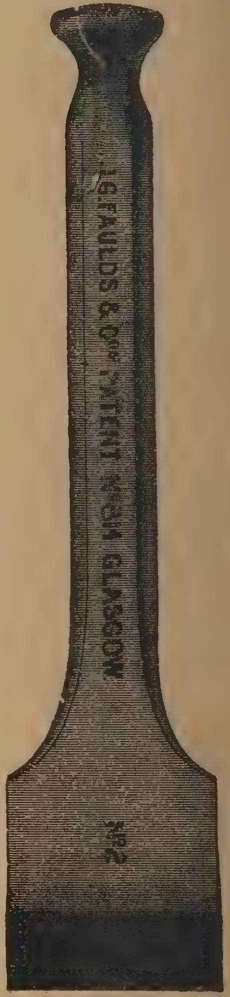
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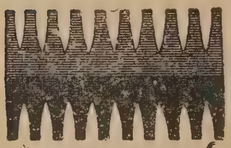

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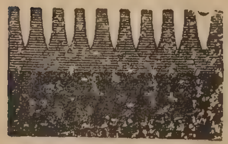

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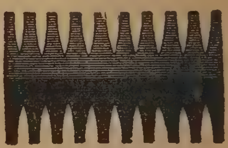

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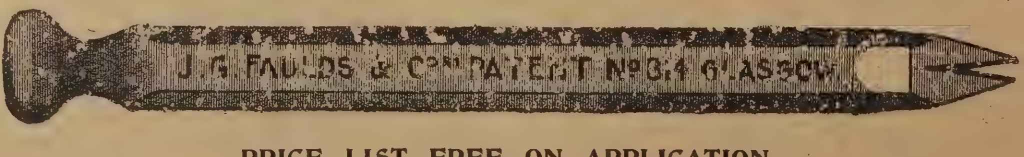
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JANUARY 3, 1900.
No. CCLVI.

EFFINGHAM HOUSE,
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Bricks and Mortar.

The Past Year. THE year that has just closed has not been altogether a remarkable one from the architect's point of view. No building of superlative merit has been built, no new genius discovered. The London improvements, of the first importance—the widening of Parliament Street, the erection of the new Government offices, and the new street from Holborn to the Strand—owe their initiative to a previous year, while the year is yet some distance ahead that can claim their completion. Meanwhile, much work of importance is going on—Christ's Hospital, the Catholic Cathedral at Westminster, Art Galleries at Glasgow and Liverpool, and in London the South Kensington completions, baths at St. Pancras, Bethnal Green, Fulham, &c.

It is evident that the nineteenth century is going to end without a distinctive style of its own; let us hope the twentieth will fare better. At present we seem to be at the height of what is called the English Renaissance, of the keystone variety, which this year has been most pronounced, and which seems to be the style that has the best chance of success in competitions. In domestic work, however,—the small country house—the end of the century seems to have evolved a style which, being founded on common sense, will probably outlive the English Renaissance, and many more fashions as well. Indeed, these small country houses will outlive much more pretentious work, and will probably be remembered as the only genuine architecture of the year.

The important competition of the year was that for the re-building of the law courts at the Old Bailey, for which half a dozen of our most successful men were invited to compete. Of open competitions the most important were those for the Kursaal at Harrogate, the Cartwright Memorial Hall at Bradford, the markets at Leeds, and the Municipal Buildings at Plumstead, all of which were keenly contested and carried through in a straightforward manner. At the end of the year comes yet another, of much importance, the Municipal Buildings at Walsall, for which one-sixteenth-scale sketches are required in a preliminary public competition. A selection will be made of the five best designs, and their authors will be paid £100 each to elaborate them. This is an arrangement which would have saved an enormous waste of time and money in the Plumstead Competition. Indeed, there is room for much improvement in the management of large competitions. Public opinion is not altogether satisfied with a single assessor, and inclines to the employment of three or more; and demands also a more definite understanding as to the lines on which designs should be judged.

In what may be called professional politics the question of registration has again come to the front, and been written about and discussed, only to be shelved again indefinitely, as far as one can see. It is possible, however, that there is a force of opinion slowly growing in its favour, which will make it necessary to take some action in the matter before very long. At present the Institute makes no sign.

The profession has lost some prominent men during the past year, conspicuous amongst whom were Sir Arthur Blomfield and Professor Banister Fletcher; while but the other day died Mr. Dollman, who was at one time well known in connection with church work and all matters ecclesiastical. On the whole, it seems to have been a good year for all concerned with the building trade. Builders have been very busy, and architects seem to have had their share of work. Quite recently, however, there seems to be a slackness among architects, and there is no doubt that the present war will affect them adversely, even if it has not done so already. Prices are still high, though there seems to be a fall in stock bricks. Rumours are about of the formation of a ring or corner in Portland cement. The speculative builder, we hear, will be hard hit by the rise in the bank rate of interest on advances. Bills will only be renewed at a higher rate. The small man, who is now just managing to keep himself going, will be seriously affected. But while he continues to put up so much work of the jerry-built and shoddy sort, he cannot expect a great amount of sympathy from architects.

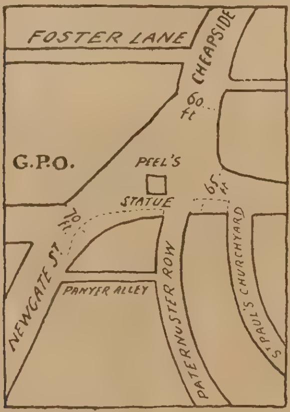
"LA DANCE": A GROUP BY CARPEAUX AT THE PARIS OPERA HOUSE.

A City Improvement. THERE is only one point in the City of London more constantly blocked than the eastern end of Newgate Street, and that is the wide area between the Bank, the Mansion House and the Royal Exchange. It is anticipated with some degree of confidence that the Central London Railway, now nearly completed, will considerably relieve the thronging traffic of the City; but at certain points there can be little doubt that the new line will actually bring a greater congestion of pedestrian traffic. Such places are the sites of the new stations, to which, when the railway is opened, great streams of traffic will naturally converge. The General Post Office Station will be situated at the narrowest end of Newgate Street, at the corner of King Edward Street, and already the thronging traffic that converges from Aldersgate Street, Cheapside, Paternoster Row and St. Paul's Churchyard has become so unmanageable that the Commissioners of Sewers are undertaking a public improvement here. It must not, however, be supposed that the work has only recently been suggested. Thirteen years ago it was seen that this busy junction of thoroughfares would have to be enlarged, and even then it was computed that no fewer than 30,000 vehicles and 100,000 pedestrians passed daily, and certainly the traffic of the City has grown enormously in the interval.

Post-office business alone is responsible for a large proportion of this undoubted increase, for the van-yard of the General Post Office discharges directly into Newgate Street and it needs only to refer to the Postmaster General's annual reports to learn how enormously the business of that department has increased of late.

When the Commissioners of Sewers were petitioned, thirteen years ago, to widen this narrow pass, they reported, after due enquiry, that the improvement was eminently desirable, but that they could not recommend its being carried out at that time while the costly widening of Ludgate Hill was still in progress. There was then no other public body in a position to share the expense, for the London County Council had not been brought to see the value of the proposed widening to the Metropolis as a whole.

In May, 1893, however, the Court of Sewers decided that the time had arrived for some action to be taken, and eventually a plan was laid before the County Council, with whose officials a prolonged conference followed, of which the outcome was three schemes for widening. Towards that finally agreed upon the Council consented to pay half the total net cost of £155,950.—Notices to treat have for some time past been served upon the owners of property scheduled for demolition, and during the past year the tall block of buildings facing St. Paul's Churchyard, Cheapside, and Paternoster Row has been demolished, opening up a grand new view of the Cathedral, a view which unfortunately will almost wholly be built in again, as the setting back of the line of frontage at this point will only be 20ft. The accompanying plan will clearly show the improvements to be made. It would, of course, be idle to contend that this measure will do more than to temporarily alleviate the daily block of traffic here; and indeed we only "improve," it would seem, for our own period, leaving the coming generations to bear their own burdens. But it is difficult to see, considering the prohibitive cost of land here, how even the wealthy City authorities and the County Council acting together could afford the outlay necessary for any permanent improvement, unless aided by a grant from the Government, which, indeed, considering how greatly the Post Office contributes to the congestion, might reasonably be expected.



The chief results of the works now to be undertaken will be that the narrowest part of Newgate Street will be widened to 70ft. from wall to wall, instead of 44ft. as at present; while the space between the back of Peel's statue and the corner of Paternoster Row will be 43ft., as against 31ft., and a width of 65ft. will be given instead of the present 45ft. at the junction of Cheapside with St. Paul's Churchyard. If not a heroic remedy, nor one of any permanency, it will be at least a great relief while it lasts. But before another fifty years have gone it will have to be all done over again.

C. G. H.

On Reflection.

An Editorial Greeting.

Whether we have yet begun a new century or not is a question upon which there seems to exist a curious diversity of view. We have our own opinion, but as the German Emperor and the Book of Common Prayer—to say nothing of less exalted authorities—may be quoted on the opposite side, we do not presume to dogmatise on the matter. Our readers will decide the point for themselves according to their several predilections. We have not yet, however, heard of anyone, who is prepared to dispute that we are entering this week upon a new year; and that being so, a word of greeting from the Editor to his readers will not be considered out of place. We have to acknowledge many kind, seasonable greetings, and to wish all our readers—the unknown thousands as well as the few who are personally known to us—a bright and prosperous New Year. The growth in popularity of the Builders' Journal and Architectural Record during the past twelve months has been phenomenal; we doubt whether any other trade or professional journal could boast of an equally large proportional increase in circulation. We attribute this gratifying progress very largely to the fact that our readers, appreciating our efforts to improve the Journal, have introduced it to their friends who have in very many cases become subscribers. We venture to hope for many repetitions of this kindly service during the coming year, so that with a still increasing circulation we may be able to introduce still further improvements, and realise our aim of making the Builders' Journal unquestionably the brightest, the most interesting and the most useful periodical for all connected with the architectural profession or the building trade.

The New Vauxhall Bridge.

We are pleased to find that, although met with several rebuffs from the London County Council, the council of the Royal Institute of British Architects have not abandoned their endeavour to obtain a bridge across the Thames at Vauxhall that would be a credit to London, and an example and precedent for the building of bridges in the future, in the provinces as well as in London. The Institute have sent a letter to the L.C.C. at the beginning of November, thanking the Council for the courtesy shown the delegates who examined the drawings and models, and in this letter make several excellent suggestions for the amendment of the design. There is no good reason why any objection should be raised by the Thames Conservancy to the suggested increase of width in the main piers, although we fear the suggestion will not be adopted by the Council, owing to the contract having already been let for the foundations. Another good suggestion is that the great projection of the cutwater in front of the pier seems unnecessary in so wide a bridge, and that a flat band with slight projection would serve its purpose better than the large projecting capping; the form of the weathering is also unsatisfactory. The other suggestions are that: (1) The semi-circular projection on the piers should be treated as part of the pier, and not as an attached column. (In the present design the stopping of the neckings to cap and base against the rustication is very awkward, merely as a matter of detail.) (2) The projecting quoins at either side of the pier upon the flat spandril of the arch have no significance and no architectural value, and should be omitted. (It is a question whether it would not be a distinct improvement to the pier to omit altogether the semi-circular column upon the face of the pier and the detached column it carries, and to treat the pier as a square one to the same design as the flat portion now indicated, but with greater projection. This would obviate the awkwardness of the raking lines of the caps of the circular columns which has been ignored in the model and $\frac{1}{4}$in. scale drawing.) (3) The arch, although increased in depth, is still painfully thin in appearance. Some expedient should be adopted whereby the voussoirs can be deepened. (4) Having regard to the weakness of the arch as designed, the council of the Institute think it inexpedient to emphasise it by the heavy rustication. The treatment of Waterloo Bridge might be studied with advantage as regards both arch and spandril. (5) There is nothing to show how the granite is returned under the soffit; the voussoirs should be properly bonded as quoins on the soffit. (6) The alternate narrow and broad dies in the balustrade have a restless and unmonumental appearance; they would be improved by being of one size throughout. They suggest that it is open to question whether a solid parapet would not assist the appearance of solidity which the design now appears to lack.

Not a Question of Professional Dignity.

Generally speaking, the Institute are of the opinion that the architectural treatment and detail of the design for the bridge lack that distinction of style and scholarship which may be reasonably looked for in a great monumental work of this kind. The letter concludes with an expression of satisfaction that the apparent intention is that granite of one colour is to be used for the whole structure. A reply to this letter has been received from Mr. C. J. Stewart, Clerk to the London County Council, in which he states that the criticisms and suggestions will have the most careful consideration, without impairing the responsibility of the Chief Engineer for a structure which necessarily, and in accordance with every precedent, falls within the business of his department. Very great advantage would have accrued if competent architectural advise had been first sought and the engineer not reckoned upon for architectural taste. It is no disparagement to the engineers to say that they have not the knowledge—obtainable only by a long and arduous study—which is required to deal with the architectural treatment of any works of this kind, and, therefore, no question of professional dignity should be brought in. There is no reason why the architect and engineer should not work together, and no architect would wish to trespass on the structural side of the work, which, as Mr. Stewart rightly says, falls within the province of the engineer.

A PHOTOGRAPH FROM LIFE.

The Study of the Human Form and its Influence on Architecture.—I.

By A. R. JEMMETT.

ARCHITECTURE demands from those who would follow it worthily an amount and a variety both of scientific knowledge and artistic attainment well-nigh superhuman.

Vitruvius, writing at the time of Cæsar Augustus, tells us what acquirements were considered necessary to an architect in his day, which, in good truth, are enough to satisfy the ambition of most men; but since the birth of modern science and thought, the man who proposes to acquire a mastery over every branch of his art is bold indeed. For, when we come to think of it, a complete mastery over architecture signifies nothing short of a complete mastery over the vital and essential things in the whole of our knowledge of nature, and in the sum of human experience. For the limits of art are no less than the limits of human endeavour; and to fully express life we must first have lived it and known it.

Architects, therefore, of the present day generally content themselves with gaining an intimate knowledge of those branches of their art for which they are most fitted by their tastes and natural endowments. Indeed, when we consider how rare is the combination in any individual of such opposite qualities as imagination and judgment, both of which are essential to a great master, we see at once that this restriction is but a natural result of the infirmity of human nature, and the appalling shortness of life. That art is long and life is brief, is a truism to some—but never to the architect. The struggle for existence, increasing in severity from year to year, compels many—who would otherwise desire to cultivate architecture as an intellectual pursuit—to attain such superficial acquirements as are most marketable, to the neglect of such as are not.

A study that for this reason, perhaps, has been almost entirely neglected by architects in this country is that of the human form. It is pre-eminently one whose fruit is not immediately marketable, or helpful to a successful career as money-maker; or, it may be that as its inspiration for the architect is more indirect than that for the painter or sculptor its value has been more easily ignored. Be this as it may, so long has it now been neglected that by the majority it has been entirely overlooked, and by the minority regarded either as unnecessary or as a counsel of perfection, according to each man's particular point of view.

It is not the intention here to discuss at much length, or to insist too strongly upon, the necessity to the artist of the direct study of nature. This much, surely, may be taken for granted. For the works of the architect, like those of all other creative artists, are necessarily founded on the works of nature, the best being those which show the firmest grasp of the laws which govern these works, and which are, so to speak, designed on the same principles. Where this has been accomplished, wide must have been the range of observation, logical the reasoning, and catholic the sympathy. In all the works of creation there is none more beautiful than, none that can compete in interest with, the human form, for it combines in itself something of the beauty of them all with the human interest that is peculiarly its own; as the old philosophers expressed it, it is "a microcosm of the world."

The advantages to the architect in this study may be briefly said to consist, not only in the help it affords in acquiring the power to draw, but principally in its influence over the mind and taste, and so ultimately over design. There is no intention to assert that this is the only or even the best way to learn to draw. It is possible to learn from a coal scuttle, and possible to study colour and tone from the same object. But it must not be forgotten that when drawing from the figure we not only improve our drawing, the means whereby we express ourselves, but we learn at the same time to familiarise ourselves with the structure of the human form.

The words "to draw" are not used here, as they seem to be too often used by architects, to express merely the ability to rule straight lines with confidence, or to make pleasing but possibly inaccurate pictorial representations of one's own or other persons' designs. "To draw" might rather be defined as the power to put things in their right places in relation to other things, or to give to colour its proper form.

For the whole of creation presents itself to the eye as an arrangement of colours of different values and in different positions. "To draw" is to give these colours their proper forms, to determine the exact space each one occupies, to put them in their proper places in relation to one another—to do this with a sense of beauty is to draw artistically.

The works of the architect appeal to the eye as arrangements of colour, to which have been given certain forms; every feature and detail affects it simply as so much colour, occupying so much space. However delightful a colour may be in itself, it is of no use, and less than no use, in a composition unless it is the right colour, of the right value, and in the right place. As the eye more easily appreciates the shape of a colour—its form—than its value—objects being generally recognised more by their shape than their colour—it seems to demand, first of all, that the form be right. In a design, therefore, the first thing is to get the objects—the colours—into their proper places in relation to one another, or what is the same thing, to give them all their proper forms. To do this is to draw.

Now the more a man draws the better will he do it, and the more he draws Nature the keener will be his appreciation of the beauty and reasonableness of her works. The more he feels this the more beautiful and reasonable will his own ideas become, and the better he draws the better he will be able to realise them. This is the direct value of drawing to the architect, as a means to an end, not so much to be able to represent the things he sees for their own sake, as the things that he imagines. If he cannot do the first, it is hopeless to expect him to do the last, and if he cannot draw what he has in his mind, cannot realise his conceptions, of what good are they to himself or to anyone else?

As an example of magnificent draughtsmanship in modern work, consider the principal façade—the mask—or, indeed, any façade of the Opera House at Paris. On looking at this one feels that everything is exactly and absolutely in its right place, that every colour has its absolute and inevitable form, that the slightest alteration of any proportion would be for the worse. Apart from any question of power and grasp of mind or soundness of judgment, of splendour of imagination or delicacy of sentiment, it would have been quite impossible to produce a work such as this without having acquired a masterly power of draughtsmanship, and unerring certainty both of eye and hand. To acquire such certainty, however brilliant the natural gifts may be, requires a long and strenuous effort, which involves a severe discipline to the mind and character; and though—as was acknowledged before—it is possible to obtain this discipline on other things than the human form, yet it seems probable that no other study can carry us quite as far.

What, then, should be the architect's method of studying the human form, and where should it differ from that of a painter or a sculptor? A figure painter or a sculptor, or again a surgeon, each would say that the study of the figure, even from his own particular and limited point of view, was sufficient work for a lifetime; and so it is. It is obvious, therefore, that an architect can never expect to know it just as they know it, not because he feels that it would be no use to him, but because life is so short, and there is so much more to learn of equal importance. What he has to do then, is, in the limited time at his disposal, to get a grip of the essentials, to drag out the underlying principle of the thing, the reasons why and

A TWO HOURS STUDY. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

wherefore; to understand the point of view of the painter, the sculptor, and the surgeon, to compare them with one another and generalise.

In this way, while not knowing it just as they do, he may possibly end in knowing it better. Surely this should be our attitude towards all branches of knowledge, impossible as it is that we should do all, and know all. The philosophers, the men of science, the workers in whatever branch of human thought and endeavour, they bring us the ideas and the knowledge we could never obtain without them, they provide the materials with which we rear a stately temple and an altar to the service of our art.

In order then to go straight to the vital essence of the subject, it is necessary to approach it in the right attitude of mind, to get a true conception of it, to work in the right spirit. The architect must remember that he is a creative artist, not an imitative one, that his aim is not so much to draw figures as to design them, which involves drawing them first; and that finally his ultimate goal is to design other structures on the same principle, which involves understanding them first. He must regard a figure not only as a beautiful arrangement of colour to be imitated, but also as a perfect structure, a living organism, to be understood. He must approach it not only from the point of view of the painter, but also from that of the comparative anatomist; must see it as one in a series, must compare it with other structures, must try and apprehend its real significance and importance in the scale of creation. For it should be noticed that, whereas to the painter or sculptor the figure in a composition is the principal or the only thing, to which all else is subordinate, to the architect it is not so. Whereas, in the conceptions of the poet or the painter it is a human being first and foremost, in those of the architect it is a mass of a certain weight and value, a line of a certain direction and importance first, a representation of a human being afterwards. The architect has to design figures to take a subordinate place, to sink into the main composition, to have their proper relative values to other things, neither more nor less. He has always to design it with reference to other things, to conceive of it as a part of the general design, not as a whole; he must therefore study it in the same way. He must not only endeavour to see it as in itself it really is, but above all things to see it in its true position as part of the general design of the universe. He must regard man, not only as "a forked radish with a head fantastically carved," or "an omniverous biped that wears breeches," but also as "a soul, a spirit and Divine apparition," and "unutterable mystery of mysteries." It is precisely this power of seeing everything in its true proportion to other things, of judging the relative value of everything, of grasping life as a whole, that is the test of the power of the creative artist, whether poet or architect; that makes the radical difference between a Shakespeare and a Shelley. The master minds have ever been those

> Who saw life steadily and saw it whole.

A TWO HOURS STUDY. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

There is needed a certain power of detachment, a power to get outside the world and calmly contemplate things from a distance, before we can get at their relative importance. With this subject in particular, so subtle is its growing fascination, that there is a danger of our studying it more for its own sake than for the education it brings. However fine a thing it may be to paint a head like Velasquez, or Rembrandt, it is a finer thing to design. When we consider one of these heads, though we can see that the subject has been summed up and presented in a way that is wonderful almost beyond belief yet we cannot but regard it as a life study—magnificent, doubtless—but still, after all, really a life study. Where such work ends, the designer's work begins.

There is a charm about the painter's life and its surroundings which appeals to us all, but no one who realised the possibilities of architecture could ever be content to abandon it for painting. We must see these things also in their relative proportions.

This faculty then of giving everything its relative importance, of putting everything in its right place, this critical faculty of mentally drawing everything, is one which we need to insist upon and cultivate to the utmost, for it is of the very essence of our work. Considering how powerful is the appeal to the senses of colour and form, we are tempted to be content with these, to neglect the faculty of judgment, and to rest satisfied with what appeals to the eye alone, the charm of physical beauty. But physical beauty, however seductive its appeal, can never by itself entirely satisfy, unless it be the outward expression of the inward intellectual and spiritual beauty—the real, the supreme beauty. Beauty of idea and of sentiment are finer things than beauty of form or of colour. To get the right idea in a design, to treat the subject in the right way, to feel its true, its natural sentiment, that is what we have first to do; neither subtlety of proportion nor delicacy of detail, neither wealth of material nor harmony of colour, none of these things will ever save a design which is not first of all true in sentiment and idea. To the human form we must turn, if we would see the perfect combination of the beauty which appeals to the eye with that which appeals to the heart and mind, for forms which not only charm in themselves, but which are the right forms in the right place. It is there we shall see the highest example of all that a building should be, the very perfection and ideal of structure.

At the present time anyone who insists on the claims of clear logical reasoning to play an important part in the work of the artist feels he is as a voice crying in the wilderness. For this very reason it is necessary to insist on a truth, which might otherwise be considered a truism. The architect has not the same licence as the poet or the musician; he has to reckon with the law of gravitation, to put out a hand and operate on nature. Art demands from him his whole endeavour, the consecration of all his faculties, the reason as well as the emotions. It is when the reason is bathed in the fire of the emotions that he feels the glow of inspiration. If imagination is the lightning flash that dazzles and blinds, criticism is the hidden force that drives it.

We must, therefore, not only feel, and feel intensely, the beauty, the poetry, of the human form, but also keep on the watch a keen searching critical faculty, analysing, comparing, generalising, probing for hidden reasons, searching after principles, but ever with an abiding sense of beauty. This is the way to understand; afterwards we can get to our real ultimate work—the work of synthesis, of re-creation.

A ONE HOUR STUDY OF A HEAD. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

But though we have all mental gifts, and all knowledge, these alone will not suffice. Nature reveals her deepest mysteries only to those who, to the intellect of the man and the sympathy of the woman, add the simple teachable disposition of the child. Such are they whom she "whispers in the ear."

(To be continued.)

Chester and its Walls.—In the course of a recent lecture on "The Roman Walls of Chester," before the Chester and North Wales Archæological Society, Professor F. Haverfield, of Oxford, said it seemed possible that the original walls of Chester were earthen walls about 50 A.D., and that these were not superseded by the stone walls until the latter part of the second century.—Dr. Stolterfoth suggested that the great thickness of the ancient walls facing the Roodee indicated that this had been a landing place or quay for the vessels which came to Chester, and the lecturer concurred in the opinion.—Mr. Henry Taylor took the opportunity to complain of the disfigurement of the ancient beauty of Bridge Street by the erection of a new building at the corner of Commonhall Street, faced with conspicuous yellow glazed bricks. A resolution was passed drawing the Corporation's attention to the matter.

Hull Town Hall.—At a recent meeting of the Property Committee of the Corporation the minutes of the Town Hall Sub-Committee came up for confirmation. They stated that at a meeting held on October 12th it was resolved that the City Engineer should prepare an estimate of the cost of the reconstruction of the Town Hall, and that designs and plans should be invited by public subscription, the premiums for the design being fixed at £300, with a second premium of £200 and a third of £100. At a meeting on December 19th the City Engineer submitted an approximate estimate, which, with fees, amounted to £120,000. The Property Committee resolved to appoint a consulting architect and assessor. At a meeting of the Finance Committee the project was regarded with disfavour in consequence of the expense, but the resolution was entered upon the minutes, and it was resolved that, upon the scheme being passed by the Council, application should be made for sanction to borrow the money.

MURAL PAINTING.

By ELMER E. GARNSEY.

THE following is a summary of a paper on "Mural Painting in its Relation to Architecture" by Mr. Elmer E. Garnsey, read before the Thirty-third Annual Convention of the American Institute of Architects, held at Pittsburgh:—I will begin with a negative definition. In the first place, mural painting *is not* the mere application of tints to architectural surfaces. Yet I venture to say that to many architects this whole question is a mere afterthought, left to the dregs of their appropriations of time and money. Some architects would seem to consider it but a concession to the weakness of their clients; considering, themselves, that any interference with the whiteness of the structure is a thing to be regretted. Under such haphazard influences, having passed through the gloom of the "black-walnut period," we seem to have emerged into an era of "white and gold," which has not inaptly been termed "the last resort of feeble minds;" it might otherwise be termed the first—imagine St. Mark's or the Capella Palatina done in white stucco, with only the decorated members picked out in gold.

The colour of a building is an important factor in its effect. And mural painting, as the application of colour to architectural surfaces, is not a matter of caprice, and still less is it of secondary importance. In the use of architectural forms, there is a reason for their employment; precedent and the inevitable logic of new conditions influence the choice of details and the use made of them. By no means the least of these details is *colour*. In the form of your building, colour bears much the same relation as it does to the human form; it distinguishes the living from the dead. When I speak of the colour of the human body, it is not of the application of artificial cosmetics to the complexion, but of the varying tints which play over the surface of the healthful body, not only differing according to the actual surface but corresponding to the different play of the muscles underneath. In a word, the colour of the human body is *organic*. Precisely so should be the colour applied to architecture. Its values are threefold. Colour should be *constructional* always. It is good if it is *expressional* also, and agreeable in *texture* and *tone*.

In regard to the constructional value of colour, the principle is recognised in exterior construction by the choice of materials. You continue to recognise it in the interior finish by the use of mosaics, natural woods, and metal work. Why then deny it to the applied colour treatment of constructive surfaces? If it is not denied in theory it is too often ignored in practice. That which supports weight should have the appearance of sufficient strength to carry the weight. Trivial or flimsy colour makes a solid wall appear to be so in reality.

Stresses and strains are reduced to an exact basis, yet the colour which clothes the construction receives but scant consideration. Certain architectural forms express clearly their purpose or origin; such as the dome, its pendentive, the frieze, and the lunette. The forms mean something in the building; the colours they bear must express that something, or their meaning will be lost. The dome crowns the structure, and suggests the heavens which are above the earth; therefore, its colour should relate to its structural form, and send it swinging farther up into the sky itself. The pendentives lock together the supporting arches, and in colour should appear to be as solid and resisting as they really are. The frieze binds the whole together, and must be a ligature of colour as well as of structure. The lunette is a resultant form, and may be treated with much greater freedom in colour than if it were a supporting form.

The second value claimed for colour is that it should be *expressional*. Nor is this entirely a sentimental consideration. Impressions are received through the senses, and certain colours create certain mental impressions or impulses. The blue of the sky dominates

A TWELVE HOURS STUDY OF A GASLIGHT EFFECT. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

every fair landscape, and we associate it with vast space and soaring height. It has been associated with religious faith from the remotest times, and the roofs and domes of both pagan and Christian temples bear witness to the sentiment expressed by it to man in all ages. The green of nature is reposeful; it reminds us of the cold depths of the forest and the peaceful quiet of the countryside. Yellow, the colour of sunlight, is joyous and brilliant, and within its scale lies gold, always a human attraction. Absolute black suggests negation; it is sad to us, and we'll ha' none of it. White, on the other hand, stands for purity, cleanliness of body and mind; and we associate it with angels and virgins. Red is an exciting colour, associated with festivity and "a hot time." We shall appreciate its value in mural painting the better after seeing Pompeii. The expressional value of colour is also associated with local and climatic conditions. New England has a different complexion from the south, and consequently demands a different prescription; while Old England and Italy are still farther apart in respect to colour expression.

The third value of colour includes *texture* and *tone*. What is called a "good job" of painting is infrequently a satisfactory finish for an architectural surface. Its smug perfection is inartistic. We resent the *paint*. Copy a tapestry—colour for colour, pattern for pattern—on a wall and hang the tapestry beside it. The one is tame and uninteresting, because it lacks the texture of the other. But how shall we achieve texture in paint on a smooth wall? It certainly cannot be done by the ordinary methods of house-painting, nor secured through the usual painter's specification. Different technique and processes must be employed. Scumbling or dragging an opaque colour over the surface, and then glazing with transparent colour, is one method; tricks and experiments, failures, and, finally, success, may be achieved by the expenditure of time and money. Tapestry and leather are also expensive wall-hangings, and texture in colour cannot be secured without proportionate cost, while it *may* be made as beautiful, in its way, as either of these, capable of honourable association with the finest woods and marbles, and the choicest products of loom and needle.

The Romans had a high appreciation of the value of architectural colour-decoration, and some consideration of the methods of Pompeian painting may aid us in the illustration of its principles. Many of even the smaller Pompeian rooms possess a wonderfully monumental character. There is little to be seen in them but the wall-paintings; the ceilings have disappeared, hardly leaving a hint of their construction. The mosaic floors are concealed by a layer of pumice and ashes; a few columns remain without entablature, and doors and windows are but crumbling apertures. Yet the scarred walls have kept their glories of colour for eighteen centuries, and *there* exists the greatest academy for the study of mural painting in the world to-day. The laying out of these wall-paintings is essentially architectonic in character and method; a dado or stylobate of dark colour, greyish, brownish, or purplish-black, the main wall-surface panelled with the primary or secondary colours, the style and rail in white or yellow, and the frieze above in some pale colour, white or grey. The general divisions were first laid on in broad, solid masses of colour, then the ornament, foliage or figure subjects were painted on them in a thick *impasto*, sometimes appearing to have been executed with a spatula, rather than a brush. Finally, the whole surface was rubbed with wax, and beautifully polished. These walls exhibit the value of colour in its application to architecture in the relations under which we have been considering the subject of colour. The colour is constructional, it is frequently expressional, and its texture and tone are superb. The ornamental forms with which the Pompeian walls are decorated do not always arise from their construction, but they are so invented and disposed that the wall is made beautiful, which is almost the best that can be asked of the mural painter. A sufficient suggestion is made of the structural character of the wall, but the painter did his work with the greatest freedom, not attempting to deceive us by a pictorial treatment, but preserved the vertical plane of the wall, while tracing upon it a pattern of perspectives, landscapes or figure paintings.

Tone in mural painting is that almost indefinable *saturation* of the whole work that, like the atmosphere of an Indian summer, melts the landscape into one delicious colour impression. The first impression one receives in the Borgia apartments in the Vatican, painted by Pinturrichio, is that of an exquisite tone or bloom which pervades the whole. A dusty-grey purple and equally dusty and grey gold seem to have crept over the whole interior. Nowhere does one or the other become a dominant colour-note. Everywhere they are both felt rather than seen. When we examine the technique of the painter we find that gilding has been carried through the entire work by such subtile means and by such rare judgment that there is almost a patina of gold over both the painted surfaces and the ornamentation in relief. The architectural forms introduced into the backgrounds, the embroidered hems of the costumes, the details of armour, jewellery and other accessories are modelled directly on the wall in slight relief, and everywhere this relief is touched with gold. Not only these, but the fruit on the trees, the flowers in the foreground, the distance, and even the sky itself have been brought under the same convention by carrying over them all a sort of diaper of little dots in relief, each of which is deftly gilded. By these means the eye is never allowed to receive an impression unaffected by gold. Again, by contrast with the dull yellow of the gold every other colour is tinged or affected by the complementary of gold colour, which is purple. It is by the judicious juxtaposition of complementary colours that this neutralized bloom is secured, and no painter, who may be called a colorist, can be ignorant of their value.

Mural painting is not only a question of colour, but of pattern. And by pattern we mean any sort of breaking-up of spaces by design; whether by lines, ornaments or figures. Much confusion exists in the study of design. The painter studies from the figure; the designer studies ornament. The architect studies both, but not in reference to colour. The whole matter of surface decoration becomes a question of pattern; and in taking up the subject, let us consider it under these three heads: *Pattern, Balance of Pattern*, and *Flatness*.

As soon as we leave unbroken planes and begin to cut them up in any way, by ornament, by figures, or by lines, we begin to work a pattern. The first condition that must be fulfilled on a painted wall is that it shall be an agreeable piece of colour. Then, is it ornamental? Does it cut up into a good pattern? Then, what is it all about? What are the names of all these gods and goddesses? Unfortunately, these questions are usually reversed. The use of the human figure in the pattern is valuable as a part of that pattern. The beauty of the pattern is not entirely dependent on the figure. A wreath or cartouche is equally valuable if properly used, and architectural motives, landscapes, and geometrical forms each have their value and place in good pattern-making.

The second consideration of pattern is *balance*: balance of empty spaces with detail, of colour with form, and of ornament with simplicity. The lunette form especially demands balance of pattern and stability of design. Its decoration should not appear as a procession that moves across it, emerging, apparently, from the frame at one side to disappear at the other. The frieze is the place for the procession. Its form demands treatment which shall suggest continuity or repetition; that of the lunette an arrangement that shall be complete in itself. For the wall that ends a vaulted ceiling stops the succession of arches or vaulting, and its design must express stability.

The third consideration of pattern is *flatness*. The word does not perfectly express the subject, which includes the much-discussed question of the wall as a solid and unpierced plane. The stricture is frequently made that the mural painter makes holes in the wall. There is no law, however, that defines how much flatness is desirable, nor are there rules as to how it is to be obtained. Absolute flatness and entire disregard of modelling would be wearisome to both the eye and the imagination. Absolute disregard of the wall as a constructive surface is equally offensive to the reason. Giotto's style is sometimes cited as the ideal technique for mural painting; but it must be remembered that Giotto painted in the way he did because he knew no other way. Nor are the conventions of Japanese of much greater value to the painter of to-day. The landscape painter seeks to destroy the actual vertical plane of his picture by leading us insensibly off into his aerial distances. The patterns of primitive peoples *are* perfectly flat, and at the same time quite incapable of inspiring lofty imagination.

Referring to the Pompeian walls, we often find a sort of linear perspective employed in their patterns. There is no attempt at actual illusion, yet in those small rooms the effect of these devices is to give us some suggestion of breadth. We are not led out through the wall into out-of-doors, but some impression of the outer world has been brought in to us. Architectural forms when treated in the grand style of Raphael's "School of Athens," do not offend us by any undue suggestion of extra-mural nature. That noble vista of arches, while it stimulates the imagination, is no panoramic or illusive background. It would seem, therefore, that while linear perspective may be reckoned as of much value in mural painting, aerial perspective had better be left to landscape painting.

The treatment of the figure in regard to flatness of execution opens up a still wider field of discussion; as precedents may be found for almost any degree of modelling, from an absolute silhouette to the frankest naturalism. Some painters satisfy themselves by using a strong outline around the figure, which is so evident a convention that it flattens everything within its boundaries, and allows sufficient modelling in a lighter key to express the action of the figure. The difficulty they encounter is that the strong contours thus obtained do not always form an agreeable pattern, and the gain in one quality is at the expense of another. Perhaps some study of the sculptor's technique might be useful to the mural painter, especially of such work as the low-relief decorations of certain Roman vaults and tombs. The contours are strongly marked in some places where the tool has cut deeply into the fresh plaster. Again, there is no line at all where the figure emerges from the ground, and its contour is entirely left to the imagination.

There are many ways of achieving beautiful results, and general principles, rather than dogmatic statements, should guide us.

St. Luke's Church, Bristol, has been reopened after renovation. The church was built in 1850 in the peculiar style of Gothic then in vogue and towards the decline of what has been called the "bare-wall period." A chancel was subsequently added, and now a suitable vestry has been provided and the church has been reseated. The chief feature of the present renovation, however, is an attempt to brighten and enliven the interior of the building by a well-conceived scheme of colouring. The cost of the improvements has been about £1,000.

Eastleigh Church has the distinction of being designed by three contemporary church architects of the first rank. In 1868 a church was built, mainly through the generosity of Miss C. M. Yonge, the architect being Mr. G. E. Street, and sixteen years afterwards an aisle was added from designs by Mr. J. L. Pearson. More accommodation being needed, it was decided to add a larger building, with which the older portions should be incorporated. For this extension plans were prepared by the late Sir Arthur Blomfield, which are now being carried out. £10,000 will be needed for its completion.

THE BUILDING TRADES IN 1899.

THE past year has been a year of great prosperity and progress in all branches of trade. Three years ago an era of trade prosperity began in England, and, if the familiar adage holds good, that trade runs in cycles of seven years, there should still be a lengthy period of exceptional industrial activity before the country. The year which has just expired has kept up the promise of unusual briskness with which it began, and each month has seen a steady growth in the volume and value of our national trade. The expansion has been confined to no single department and some industries that were threatened with extinction have been revived with some prospect of permanence. The economic conditions of the country have been sound, trade has been active, employment has been good, and wages have been high. As regards the labour market the number of men out of employment, according to the Trade Union returns, has been smaller this year than in any year since 1894. There has been about the usual number of strikes in the building trades, but none of very great extent. Below we give a few particulars relating to the state of the building trades during the past year in the more important towns. Reports have not yet come to hand from all the trade centres, but will be given in due course.

ENGLAND.

Barnsley.—There has been less activity in the building trade during the year, and with a growing population, there has been less empty property in the working class parts of the borough than was the case in 1898. In the business centres of the town competition has been keen enough, but values of property have gone up rapidly and a record price has been reached in the purchase value of shop property.

Birmingham and the neighbouring Black Country have had their full share of the trade improvement last year. Activity has been especially marked in the building, engineering, coal raising, and iron and steel producing trades.

Bradford.—Both the stone and iron trades have been busy this year, though the building trade, in its turn, had the misfortune to be seriously interfered with for some time, as the result of the plasterers' strike. Building operations are proceeding apace in the city, and there is no prospect of any decline in the present prosperous condition of affairs, in face of the projected public works, which include the Cartwright Memorial Hall, the Fire Brigade Station and the market extension. The prices prevailing during the year have been as follows: Self-faced flags, 2in. thick, from 2s. 4d. to 2s. 6d. per yard super., 2½in. 2s. 10d. to 3s. 2d., and 3in. 3s. 6d. to 3s. 10d.; tooled flags, 2in. thick, from 3s. 3d. to 3s. 6d. per yard, 2½in. 4s. 5d. to 4s. 7d., and 3in. 4s. 6d. to 4s. 8d.; ashlar, from 1s. 8d. to 2s. 2d. per cubic foot (dimension sizes), outside wall stones, 52s. to 58s. per rood, inside wallstones, 20s. to 24s., pitch-faced wall stones, 46s. to 52s. per rood; common bricks, 25s. to 30s. per M, at works. The following are the Corporation statistics, showing the number of dwelling-houses and others, being included in the 455 plans approved during the year ended September 30th, as compared with the previous year:—

	1898.	1899.
Dwelling-houses	1,146	1,216
Houses and Shops	63	52
Warehouses	32	9
Mills	2	2
Workshops	14	17
Places of Worship	2	2
Lock-up Shops	39	63
Sundry Bldngs.	521	441
Streets	47	41
Totals	1,866	1,843

In the timber trade prices are 33 per cent. above the lowest point of the last two or three years, and the supply has been inconveniently short. With regard to house-building in Bradford, it may be noted that the demand for property has been so good that many builders refuse to let. They have been able to sell as soon as the houses have been put up, and at remunerative figures. Buyers are easily found, and, with the help of the building societies, the number of property-owners is largely on the increase. With regard to the stone industry at Idle, it is a good many years since the demand was so great. The orders are more than the various firms can almost cope with, and, of course, this demand has had a corresponding effect on the prices. So far there is every indication of the present brisk condition of trade continuing.

Brighouse and Elland.—In the local stone trade, both at Brighouse and Elland, trade has been good, and a year that has scarcely been surpassed in demand for several kinds of material, chiefly paving stone (2½in. and 3in. flags), closes with very little stock on hand, and a ready demand for most of the varieties of stone quarried in the district. The open weather which prevailed until about three weeks ago, had the effect of enabling the local stoneworkers, of whom there are a very large number in these districts, to follow their employment. It is computed that over 300,000 tons of stone have been sent from the Brighouse district during the year by rail or boat, and most of this has gone to London, whilst large shipments have also been sent to Hull and Liverpool for conveyance abroad. Many new quarries have been opened in the district, principally at Hove Edge, and stone of good quality and in quantity has been found. The brick making trade has maintained its standard of production. In the firebrick and sanitary earthenware works at Elland the year has been a good one, the extensive sewage schemes that are being carried out in various parts of the country naturally causing a big demand for drain and sewer pipes. In the case of Brighouse it is generally recognised that the rapidity with which the local rates and charges have increased during the past few years has had something to do with retarding what would no doubt have been the phenomenal growth of this active and well-situated industrial centre.

Bristol.—The building trades have been brisk, but are likely to improve this year, owing to the large municipal schemes on hand. Bristol improvement schemes have in the last ten or twenty years unhoused a large number of poor people, the former dwellers in many undesirable courts and tenement houses, now happily no more. The duty of finding houses for these and for the ever-increasing population is being met by private enterprise, and the City Council have decided to build seventy small houses for poor people in view of the unhousing of a considerable number of people by street improvements. Another very interesting departure which has been resolved upon is the building of a municipal lodging-house in St. Jude's. Several schemes of street improvement delayed pending the settlement of other housing problems are now presumably free to proceed. A fine set of new baths are about to be erected at Barton Hill by the Corporation. The new library for Bristol North, the cost of which, including site, will be £13,700, has been commenced. A new school is being erected in Cheltenham Road. There seems a likelihood of the new municipal buildings, which are so badly needed, being begun this year. It is proposed to erect a large block of building in this connection, to house also a central library and an art gallery. In addition to the activity in municipal affairs there has been a large amount of industrial activity involved in church building and extension, the erection of schools and the reconstruction of the tramways. There has been a fair amount of work done in building offices, business premises and dwellings. Fine blocks of offices for insurance companies have in the last year or two improved several of the principal thoroughfares. The main thoroughfares in the suburbs are every year becoming more town-like, and the process of converting private residences into shops is still going on in Cheltenham Road, Gloucester Road and elsewhere. An important contract now in course of execution is that for the erection of Colston Hall from the first premiated designs of Messrs. Jones and Cummings, of London. The building it is hoped will be ready for use by October this year.

Halifax.—The various branches identified with the local building trades have had a busy and, upon the whole, a prosperous year. The extension of the borough and the adoption by the municipality of a system of tramways have given an impetus to building operations, and this has been very marked throughout the year, but particularly so during the closing quarter, when the demand for materials was unprecedentedly large. The extensive local brick and tile industries have been taxed to their utmost to supply district orders, and stocks were probably never lighter than at this December stocktaking. Taking the year as a whole, better prices have ruled, and double the quantity of building materials has been used as compared with the state of things five years ago. The new year will commence with considerable activity and a large demand for building materials, but circumstances are such that it is difficult to gauge the outlook. Prices are very high—some people think abnormally so—and, were a "slump" to supervene, trade would be dislocated for a time.

Huddersfield.—Builders have had as much work as they could get through. Few new houses have been erected, but there has been a great deal of work done in the putting up of public buildings. Trade was considerably dislocated for some months by the plasterers' strike and the lockout of 25 per cent. of the men in other trades for five or six weeks, and also by the local strike of joiners, who obtained an increase of wages. There are good prospects for the coming year. Contractors are hampered by the refusal of the Operative Masons' Society to allow stone to be worked in Huddersfield and sent out to other towns in Yorkshire (thus also checking the quarry trade), though large quantities are sent to London without objection by the trades union there.

Hull.—More plans have been passed for house property, warehouses, &c., than in the previous year. The dispute between the operative builders and their employees has resulted in less work being done, but it did not at any time stop the deposit of plans, especially for house property, and the dispute has resulted in the establishment of more speculative builders than existed before, for this class of men were able to go on with their work more or less regularly, the large contractors for public works being more particularly affected.

Keighley.—Building has been active in the borough this year. The street improvements have led to the erection of a considerable quantity of good shop property. Dwellings have also been put up in such numbers as to quite overtake the demand, and, with the hardening in prices of building material, some slackening is in prospect.

Leicester.—The march of the industrial year has been, on the whole, smooth. The chief exception to the harmony between employers and operatives has been the protracted rupture between the builders and the bricklayers' labourers. This was precipitated by a nominal demand for an extra penny an hour, but it was frankly intimated from the outset that the concession of a halfpenny would end the difficulty. This the employers refused on various grounds. Their workmen just as resolutely declined to be content with a farthing less. Attempt after attempt was made to end the dispute, but without success until Sir William Markby was called in through the friendly offices of Mr. Councillor Smith, and awarded the desired halfpenny. By this time, unfortunately, the strike had been allowed to drag on for no less than twenty-five weeks, and employers and labourers sustained losses which it must, in some cases, take years to repair. The lock-out in the building trade has not affected the number of plans passed for new buildings to any serious extent, as will be seen from the following table:

	1899.	1898.
New Houses	2005	2404
Alterations and additions	894	844
Shop Fronts	232	293
Sheds, &c.	163	161
Warehouses and Factories	87	73
Special Bldgs	36	43
New Streets	39	83
Totals	3456	3901

In municipal work a busy year has been experienced. The total value of the work completed in sewage work is close on £20,000, and new causeways in various parts of the town have been kerbed and flagged or gravelled at a cost of nearly £2000.

Leeds.—There has been much to contend against in the building trade, and for many of those engaged in it the year brought much anxiety. Out of evil, however, has come good. After the storm the calm, and, as freedom from labour troubles is anticipated for some months to come, a period of unexampled prosperity should be experienced. The trouble between employer and employed which marked the early months affected Leeds, in common with the rest of the country; while the local dispute in connection with one section of the bricklayers tended still further to temporarily paralyse what should, and would, have been a brisk industry. It is comparatively recently that work can be said to have got again into full swing, and even yet some big jobs are standing idle, as some have already stood, because of that litigious obstruction—ancient lights. Injunctions have been obtained in certain cases, to the confusion of builders and the annoyance of architects. Both builders and architects will, it is thought, require in future some protection against the consequent loss through delay and the payment of interest on money which for the time being is yielding no return. The value of materials has hardened, notably in the case of constructional ironwork, such as girders, and there has been a big demand for bricks. The erection of dwelling-houses did not suffer the same delay as other classes of work. This class of work is in the hands of the speculative builder for the most part, and as the speculative builder is not attached to the Federation he does as he listeth. The fireclay industry in Leeds has been prosperous. Local firms report that they have been kept fully employed throughout the year, and the prospects are of an encouraging character now that the troubles in the building trade, upon which so much depended, have been settled. It might have been expected that the recent strike would have had an injurious effect upon fireclay products, but as it was only partial, local firms were not affected to any material extent. The industry in Leeds at any rate did not suffer, and the local specialities in terra cotta, faience, glazed and fire bricks have been in as great a demand as ever they were.

Manchester and Salford.—The building trade in all its branches has throughout Manchester, Salford, and district been exceedingly brisk during the year. Wages have had a tendency to go up, and with one exception the year has been free from strikes or disputes of any magnitude. That exception was the sixteen weeks' strike or lock-out of the plasterers, who demanded an increase of a penny per hour, but eventually accepted a half-penny. Generally speaking, the volume of trade has been greater than previously. The prospects for the coming year are bright. Contractors have plenty of orders in hand.

Normanton.—The brickmaking industry has been prosperous. Many cottages—and the new ones are a better sort than the miners' dwellings of thirty years ago—are rapidly put up.

Nottingham.—The trade has been prosperous. On the outskirts of the borough a good many large estates have been bought for the purpose of converting them into building plots, and there has been a large increase of cottages and villas.

Otley.—The whole of the industries have been very busy, and there is every indication that the ensuing twelve months will be equally prosperous. This prosperity has resulted in building operations being carried on during the past year to a great extent, and a number of cottages and villa residences have been erected in all parts of the town.

Sheffield.—The great increase in building operations at the end of 1898 has been more than maintained and large contractors have been unable to take more work. In the centre of the city the rebuilding of High Street has been continued and is now almost complete. At several of the large works buildings of immense size have been erected, and in all the suburbs villa and cottage property has been built to an enormous extent, and as soon as completed the houses have been occupied. The new tram service is taking the working classes from the centre of the city and builders are making provision for them in the outside districts as rapidly as possible. The following table shows the number of the buildings erected within the city boundaries from the beginning of the year to December 21st:

	1898.	1899.
Length of streets with sewers	17,683 yds.	10,909 yds.
Plans of new sewers approved	—	16
Length of sewers approved	1,155 yds.	972 yds.
Houses certified	2,273	2,603
Other buildings completed	338	262

Wakefield.—The past year has been prosperous and the prospect is encouraging. Architects, builders, timber merchants and others engaged in the building trade have experienced a good year. The County Council have erected new acute blocks in connection with the asylum at a cost of nearly £100,000, and enlarged the County Hall, which has cost the Riding about £120,000. An unusually large number of shops have been modernised and enlarged during the year. New dwelling-houses, chiefly cottages, are springing up all round the city. Building land for the erection of better-class residences was somewhat of a drug, although there is a demand for that suitable for erection of artisans' dwellings.

Yeadon and Guiseley.—Building has been sparse at Yeadon, but at Guiseley there has been a considerable addition to the houses of a better-class character.

SCOTLAND.

Aberdeen.—The granite trade of Aberdeen has, in some aspects, been remarkable during the past year. In one respect as regards the number of new buildings actually added to the city the year has been one of the most prosperous ever experienced in the city, and yet at the present moment the granite trade is undergoing a period of altogether unusual dullness. This dullness has come somewhat suddenly upon the trade, and is due to various causes. The comparatively high price of money, which renders it difficult to operate in new buildings with a very fair prospect of advantage, is one reason, and another is the fact that more than an impression is abroad that in some quarters of the city at least something like over-building has been going on, and a decline in the value of house property may ensue. However, the existing state of matters does not seem to justify any alarmist view in this regard. The shrinkage that has been apparent in the building trades in the city has shown itself also in the allied granite monumental trade. As regards the home trade, a very good trade has been experienced; this is largely due to the continued development in the use of polished granite for architectural purposes. On the whole, the volume of work done at the Aberdeenshire quarries has been quite up to the average during the past year. In several of the quarries the chief difficulty seems to be to obtain sufficient supplies of suitable polishing material to meet the demand. As far as the settmaking industry is concerned, the year has been a very prosperous one. For both local and export purposes there has been a greater demand than there has been for a number of years past. Not only has the demand been exceptionally great, but the marketable value of the setts has kept very firm throughout the year.

Brechin.—The building and allied trades have been in a rather depressed state during the year, very little work, in the way of building, being done. The prospects for the ensuing year are, however, looking a little better.

Dundee. — The activity in the building trade so pronounced in 1898 has been fully maintained during 1899. It has been confined to no particular department, but, if there has been one particular direction in which it has been more manifest than another, it has been in the erection of tenements of houses for the accommodation of the working classes. While the bulk of such property has come into existence as a bonâ-fide investment, the speculative element has not been wanting. Present indications point to the conclusion that the needs of the city population in respect of dwelling-houses have been fully met for some years to come; indeed, an impression prevails that to some extent building of this class of property has been overdone. Wages in all branches of the building trade have ruled high. Regarding the outlook for the ensuing twelve months the prospects are that the high water mark has been reached, and that there will be an easing off of the pressure which has been steadily maintained for the past eighteen months. The work to be undertaken by the Corporation, representing a sum of about £300,000, will form a fruitful source of employment for some time to come.

Fife and Kinross.—The building trades in Cupar have been exceptionally busy. The masons, builders, and kindred trades were fully employed during the whole season in the Cupar district, and the prospects for 1900 are equally satisfactory. Building in St. Andrews has also been very brisk during the year, and in Kinross has been unusually busy.

Forfar.—There has been a lull in the activity of the building trades, so far as the town was concerned, but a larger amount of country work than usual kept these trades well employed.

Kirriemuir.—The building trade has been pretty active since the advent of spring, but still there is felt a want for the better class of workmen's dwellings, the building of which is no doubt retarded for want of suitable sites and the heavy charges for local taxation.

Monifieth.—A number of cottages and a large hotel have been erected; the drainage system is being extended, and new streets have been made and new roads opened up.

Montrose. — The building and kindred trades have had a fairly prosperous year. The wood trade has been in much the same state as during the preceding year; no cargoes of dressed timber have been shipped direct from the port to the Colonies for almost two years, which seems to indicate that this branch has fallen upon evil days.

Newburgh. — The building trades have been well employed during the year, several improvements having been carried out in the town. New Slaughter-houses are in course of erection.

Newport and Wormit.—The building trade in the district has been, if anything, quieter, after the great activity of preceding years.

Perth and Perthshire.—The building trade in the city has been very brisk and the wages good. New public halls have been erected at Pitlochry and Almondbank, and a new hotel at Kinloch-Rannoch.

Stonehaven has experienced a very satisfactory year in the building trade, which has for several years past been one of the leading industries of the town; altogether over £20,000 worth of work has been erected or sanctioned during the year.

Memorial Windows at Aberdeen.—A three-light memorial window has been placed in St. Mary's Chapel, Aberdeen. It is the work of Mr. Whall, of London. A three-light window has also been unveiled in Gilcomston Free Church, Aberdeen. This was designed by Mr. David Gauld, and made by Messrs. Guthrie and Wells, of Glasgow and London.

A Peculiar Summons.—An action was down for hearing at Marseilles last week which has been pending against the city for over thirty years. The plaintiff is the well-known sculptor Bartholdi. Many years ago he executed a monument for the city, but left it unsigned. He subsequently wished to add his name to it, but the city authorities refused permission, and after endless negotiations the present action is being brought to compel the Marseilles Municipal Council to allow the artist to put his name to the statue.

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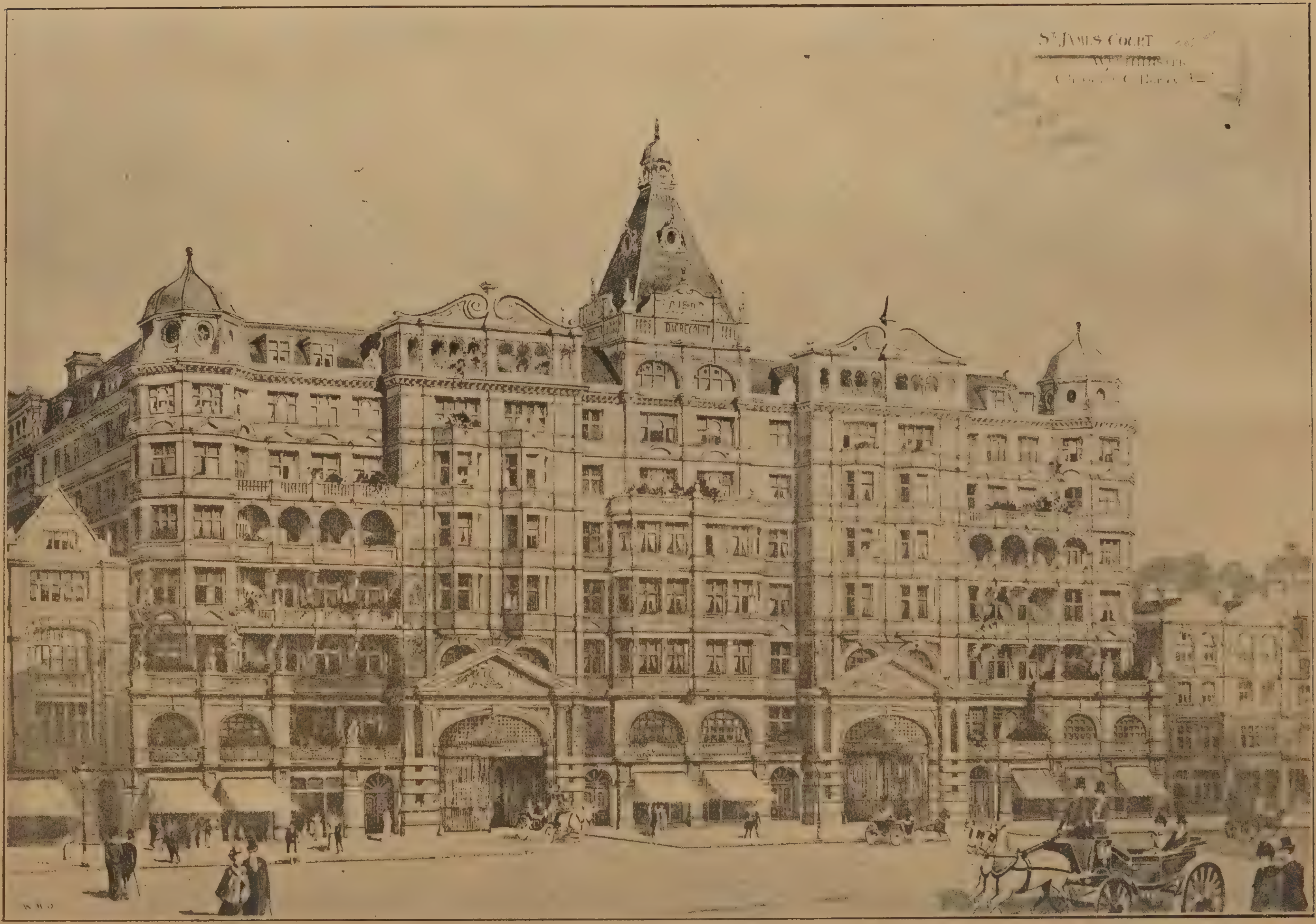
SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, WEDNESDAY, JANUARY 3, 1900.



BUILDINGS IN ST. JAMES'S COURT, WESTMINSTER. C. J. C. PAWLEY, ARCHITECT.

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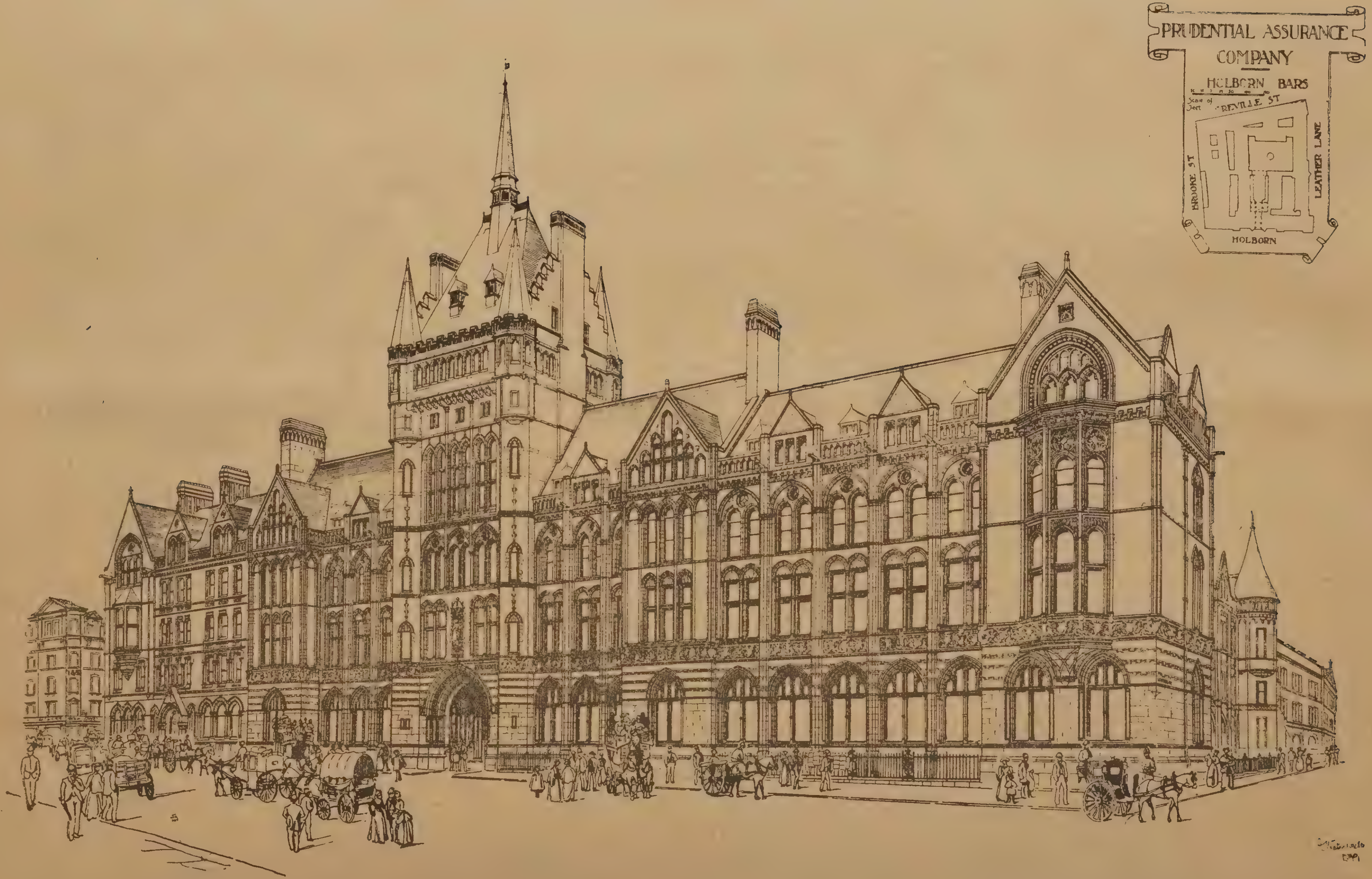
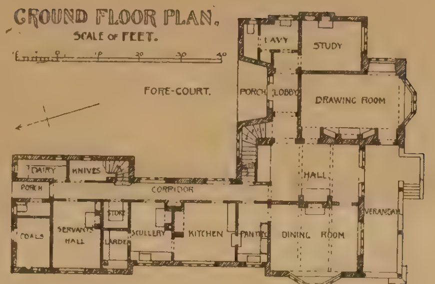
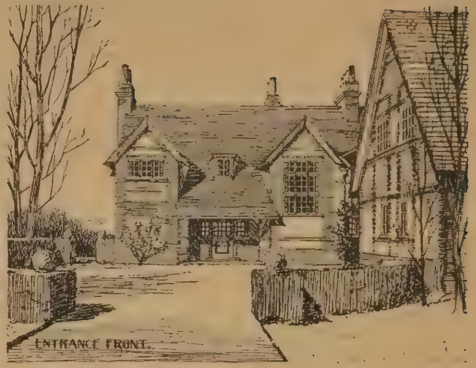
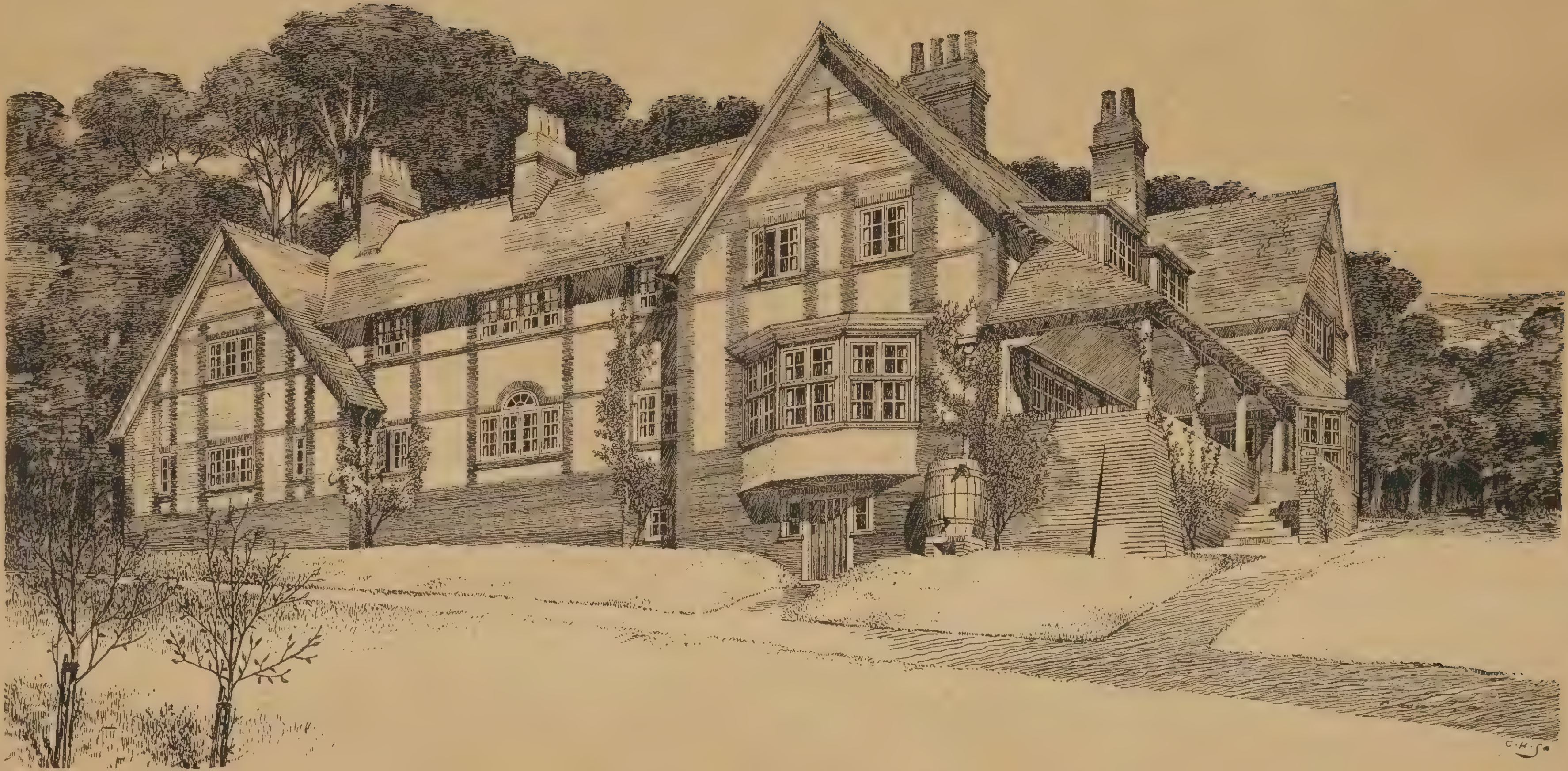


PRUDENTIAL ASSURANCE COMPANY'S OFFICES, HOLBORN, LONDON. ALFRED WATERHOUSE, R.A., ARCHITECT.

GROUND FLOOR PLAN.




ENTRANCE FRONT.



"COLD ASH," NEAR NEWBURY. LEONARD STOKES, F.R.I.B.A., ARCHITECT.

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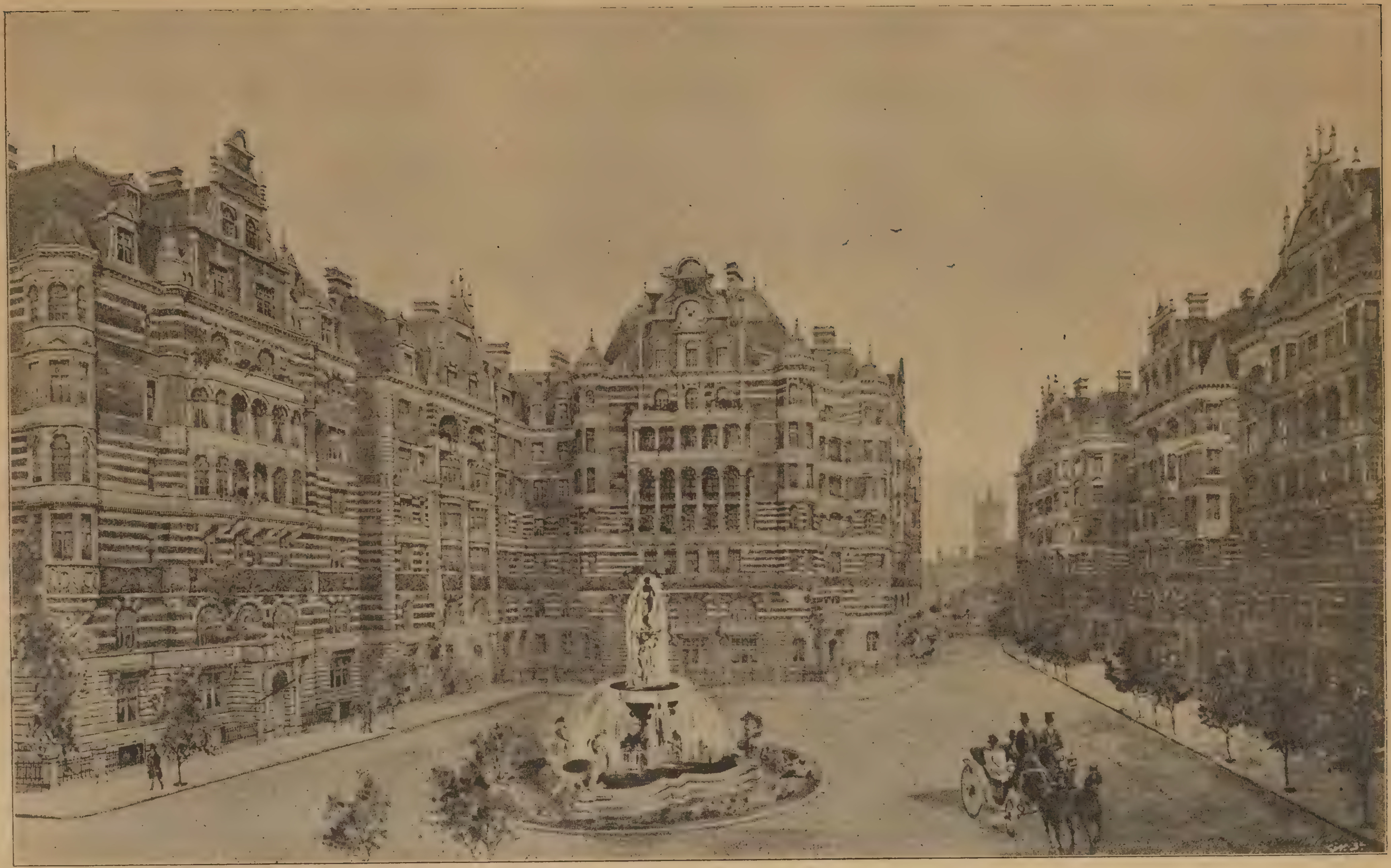

ST. JAMES'S COURT, WESTMINSTER. C. J. C. PAWLEY, ARCHITECT.

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GLASGOW BUILDING REGULATION ACT, 1900.

THIS is the title of the Bill which is to be promoted in Parliament next session. It is divided into sixteen parts, and the following synopsis will serve well to show what conditions are proposed to be enforced in connection with future building operations at Glasgow.

The preliminary part consists of a number of definitions and meanings of many of the words used, such as "private street," "new building," "party wall," etc., about which so much litigation often occurs. By section 18, Part 2, dealing with streets, the Dean of Guild can refuse to sanction plans for a street which is less than 50ft. wide or which has a gradient steeper than 1 in 12. Section 26 provides that in the case of any public street more than 80ft. wide the Corporation can enclose a portion in the centre as ornamental or pleasure ground, leaving at least 25ft. on each side. In Part 3, which deals with through ventilation, free space, &c., section 35 requires every hollow square to have an opening not less than 15ft. wide and open from 15ft. upwards; but this does not apply where the buildings do not exceed four storeys in height, and have an enclosed background space containing not less than 1,800 square yards, and being not less than 90ft. across at the narrowest part; and where the buildings do not exceed three storeys in height, and have a background space of upwards of 1,400 square yards, measuring not less than 65ft. across at the narrowest part. Part 4 deals with sewers, drains, cesspools, &c., and in section 55 of the following part it is stated that every water-closet shall be supplied from a separate cistern having a capacity to give a flush of not less than three gallons. Building lines, sites and foundations form the subject of Part 6, and by section 61 no building may be erected, without the Corporation's consent, beyond the general line of buildings, in any street "where the distance of the line of buildings from the nearest part of the street does not exceed 30ft., or within 30ft. of the street where the distance of the line of buildings therefrom exceeds 30ft."

Section 67 (Part 7) limits the height of buildings, churches excepted, to 90ft., exclusive of ornamental towers, turrets, or other architectural features or decorations. No dwelling-houses are to exceed in height the width of the street (section 68), and in every building exceeding 200 square yards in area that is used partly for trade purposes and partly as a dwelling-house, fireproof division walls and floors are to be provided (section 71). Excepting one-storey buildings of brick, stone, iron, or other incombustible material, no warehouse shall, without consent, extend to more than 350,000 cubic feet without party walls (section 72). The construction of buildings is dealt with in Part 8, where section 75 stipulates that the safe carrying load, in addition to the weight of the materials, shall be 100lbs. per square foot of floor for dwelling-houses, 180lbs. for public buildings, and 224lbs. for warehouses and factories. A safe load on timber is to be held to be one-seventh, on wrought iron one-fourth, and on cast iron one-sixth of the breaking strain. No machinery or goods that exceed in weight 224lbs. per square foot of floor space are to be placed on the top floor of a building, unless special provision has been made for the purpose. Section 79 requires gables or party walls between tenements or self-contained dwelling-houses to be carried up 9in. thick to 12in. above the roof. By section 84, the enclosing walls of hoists or elevators are to be formed of incombustible material; by section 86, roofs are to be constructed of or covered with incombustible material; and, by section 87, every roof has to carry as a safe load a minimum weight of 50lbs. per square foot of surface, in addition to the weight of the roof itself.

By section 91, every fireplace opening without grate or stove is to be stopped up, and in all new buildings every stair having an open well-hole is to be supported by iron beams (section 93). The subject matter of Part 9 of the Bill is noxious and dangerous businesses. Part 10 deals with theatres and public buildings. Section 101 provides that no theatre or music hall accommodating more than 1,000 persons is to be built which is not distant 15ft., on three sides at least, from the nearest building; the auditorium floor is not to be more than 3ft. above the street level; and fireproof construction is to be observed throughout. Exits from public buildings are not, by section 102, to be less than 1ft. wide for every seventy persons seated in the building, the minimum width of exit being 4ft. In Part 10 (special provisions for certain buildings) it is stated that dwelling-houses of one, two, and three rooms are not to contain less than 1,000, 1,600, and 2,400 cubic feet respectively. Every room on the basement and street floor (section 105) is to be at least 9ft. 6in. high from floor to ceiling, and every other room 9ft. high, except attics, which are to be at least 8ft. high. Every workroom is to be at least 11ft. high.

Part 12 deals with neglected structures, and Part 13 with scaffolding, barricades, sites for advertisements, &c. By section 133 (Part 14, procedure, expenses, notices, &c.) the Master of Works may test the strength of the materials being used at the expense of the owner. Part 15 deals with by-laws and penalties, and Part 16 with savings, &c.

In a schedule it is stipulated that the minimum thickness for external walls, if of stone or concrete, shall be 16in., 18in., 20in., and 24in. for one-, two-, three-, and four-storey buildings respectively; if of brick, 9in. for one-storey buildings, 14in. and 9in. for the first and second storeys respectively of two-storey buildings; 18in., 14in., and 14in. respectively for three-storey buildings; and 22in., 18in., 14in., and 14in. respectively for four-storey buildings. This applies to storeys not more than 14ft. high. Walls of newel stairs are to be not less than 4½in. thick, and those of hanging stairs not less than 9in. thick.

A MODEL CITY.

AN AMERICAN SCHEME.

THE interview with Mr. Ebenezer Howard, published in the BUILDERS' JOURNAL for October 25th, on the subject of his proposed "Garden City," and the correspondence to which that interview gave rise have attracted considerable attention, and have elicited some interesting information with regard to a somewhat similar project that has been set on foot on the other side of the Atlantic. By the courtesy of Mr. Howard we are enabled to publish the following letter which he has received from Mr. C. Herbert McClare, architect, of Cambridge, Mass.:—

"DEAR SIR,—I have read with much interest the several articles in the 'BUILDERS' JOURNAL' relating to your proposed 'Garden City,' and I wish to say that I think it a grand scheme, and hope you will be successful in having it carried out.

"There are a few minor points I hardly agree on, and think, with Mr. Strange, that a circular plan is not advisable, but I understand it is only a suggestion, and can be modified.

"For several years past I have given the matter of an ideal manufacturing community much serious thought, and some time ago secured a charter from the Parliament of Nova Scotia (of which country I am a native) for the purpose of building up agricultural and manufacturing industries in that part of Canada on lines similar to those proposed by you. I send you copies of the prospectus of the Co-Operative Company of N.S., which may interest you and give further suggestions in the direction of co-operation.

"Ours is quite a large undertaking for a people without great wealth, but you will note that it is planned in such a way that people of small means may participate in all the advantages of employers, and, at the same time, be employees. The main object of all this is to keep the people in the home country, and induce as many as possible of those who have emigrated to the U.S. to return and help develop the grand resources of their native land, and make that part of Canada one of the finest portions of the Empire of which we are all so proud.

"You will please note in the plan of 'Winchester,' shown in prospectus, that I have laid it out on the Meander River, which is to furnish the power for the various manufacturing enterprises, and that the various factories are grouped at either end of the town, which extends along the river. The wood-working mills and factories are at the upper end, and the textiles, &c., at the lower end. This plan will keep whatever dirt or noise there may be confined to these localities, and the building lots nearest the factories are reserved for the use of employees.

"You will also note that the public buildings, stores, shops, churches, schools, &c., are located in the centre of the town, with a grand approach over the bridge from the railway station.

"The street nearest the water on the town side is quite wide, and will form an esplanade, with buildings on one side only, and a pretty water park on the other side, the whole length from the lower to the upper mills—something over a mile.

"The main cross street (Victoria) is also very wide (120ft.) with provision for electric tramway. This street, after crossing the river on the bridge and esplanade, has the town hall on one corner and a large hotel on the other, with business buildings and offices next, and then the park or gardens with schools and public library, and the whole surrounded by fields and hedgerows, making, when completed, a very charming picture. Of course it is not so large a venture as you propose; probably the town will never contain more than 5,000 people, and if it is as successful as we anticipate we will plant another in some other part of the country—that will be an object lesson of what may be done by co-operative action. The beginning is slow, and much hard work is necessary for success. Hoping your plans may be successful, I remain, yours truly,

Cambridge, Mass., "C. H. McCLARE."
December 11th, 1899.

A perusal of the prospectus which accompanied the above letter shows that the American scheme differs in some important respects from that of the Garden City Association. In both schemes the aim is to establish a city where life may be lived under the happiest and healthiest conditions, and in both cases co-operation is the means by which this result is sought to be accomplished. But, whereas in Garden City the freest individualism would prevail, in Winchester, as the new city in Nova Scotia is to be called, affairs will be conducted on more strictly collectivist principles. The company which has the matter in hand proposes not only to acquire the land and build dwellings, but to build also schools, banks, hotels, churches, &c., to conduct mining operations, to run factories for the manufacture of boots and shoes, clothing, furniture, carriages, agricultural implements, &c., to carry on tinned provision works, a tannery and a publishing business, and generally, it would seem, to control the whole industry of the town. The capital of the company amounts to 250,000dols. which is divided into 5,000 fifty dollar shares. When a shareholder has paid into the treasury of the company a sum equal to 20 per cent. of the par value of the stock held by him, he is entitled to employment by the company, if he desires it. This, we take it, does not mean that only shareholders are to be employed; in the varied industries of the city, many of the poorer classes, as well as the comparatively well-to-do who become shareholders, would necessarily be employed. We do not see any provision made for workmen's dwellings, though there is a regulation that "tenement houses and other objectionable structures will not be permitted." The citizen of Winchester is encouraged to become a freeholder, but in "Garden City," it will be remembered, there is to be but one landlord—the municipality—Mr. Howard holding that a leaseholder in Garden City is better off than a freeholder elsewhere. These are points worth noting, in addition to those mentioned in Mr. McClare's letter.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

PRICE OF BRICKS.

NOTTINGHAM.—E. J. N. writes :—"Can you tell me the price of stock bricks in London for each year during the past ten years?"

The *average* price of stocks for each year was, per M of 1,200: 1889, 46s.; 1890, 46s.; 1891, 42s.; 1892, 42s.; 1893, 42s.; 1894, 43s.; 1895, 44s.; 1896, 45s.; 1897, 47s.; 1898, 47s. At the beginning of the present year, the price reached nearly to 51s. per M, but in the last six weeks the rate has considerably decreased.

R. W. C.

BOOKS ON QUANTITY SURVEYING.

WREXHAM.—"SUBSCRIBER" writes: "What do you consider the best books on quantity surveying, particularly those dealing with the law of liability as between proprietor, surveyor, and contractor?"

The best books are Leaning's "Quantity Surveying" (Spon); Davis's "Quantities and Quantity Taking" (Whittaker); "Specification" (published at these offices, price 5s.); and Stonhan's "Legal Position of Architects in relation to Certificates and Awards" (to be obtained from the Secretary, R.I.B.A., 9, Conduit Street, W., price 1s.). G. A. T. M.

DRAWING AN ELLIPSE.

LONDON.—STUDENT writes:—"If at an examination in geometry you were asked to draw *an* ellipse, would you be expected to draw a true ellipse, entailing a certain amount of freehand work, or would it be permissible to draw an approximate one by compasses?"

In an examination in practical geometry an ellipse must be drawn as a true ellipse—that is, by one of the methods giving intersections in points on the perimeter, these points being joined by a freehand curve. Compass curves are all circular, and cannot, therefore, be parts of an ellipse, which is a curve of constantly varying radius. HENRY ADAMS.

CLERKS OF WORKS' EXAMINATIONS.

PLYMOUTH.—E. B. writes: "Seeing in your valuable issue for December 13th that G. A. T. M. (in answer to 'W. C.,' Combe Martin) says there is only one examination for clerks of works, would you kindly let me know where it is held and by whom. Also, what are the subjects and age limits, as I notice it is stated that 'W. C.' has passed the age limit?"

LEEDS.—KING-POST writes: "Is there any recognised examination for clerks of works? If so, when and where is it held, and what is the age limit? What is the British Institute of Certified Carpenters?"

Examinations are held at varying intervals for clerks of works in H.M. Office of Works; but the conditions have been frequently altered, and we can only recommend our correspondents to apply for the most recent information to the Secretary, Civil Service Commissioners, 68, Victoria Street, S.W. Particulars of the British Institute of Certified Carpenters can be obtained from the Secretary of the Society, at Carpenters' Hall, Throgmorton Avenue, E.C. G. A. T. M.

CHOICE OF A PROFESSION.

LONDON STUDENT writes:—"I have been for the last year and a half in the office of one of the leading London architects, and am beginning to trace, &c., very well, and I attend the Polytechnic for building construction. I am not an articled pupil and have not the means to become one. I was wondering which would be the better to do—go and learn a trade or remain in the office. Do you think that if I remained in the office I should be able in a few years to obtain a situation as an improver, supposing I hold South Kensington certificates?"

It is very difficult to advise anyone as to his future career without a personal knowledge of the enquirer, as so much depends upon his aptitudes and even personal appearance. Architecture is not at present a close profession, and anyone having the ability can become an architect and practise as such without having been articled. South Kensington certificates are not thought much of by architects, because it is possible to obtain them through knowledge rather than through ability, two very different things. A prospective architect cannot do better than join the Architectural Association as a student and make full use of the advantages there given. If the enquirer has no artistic faculties, and has not already begun to scheme out designs and constructions, he will probably do better at the bench. HENRY ADAMS.

Correspondence.

ELLIPSE BY COMPASSES.

To the Editor of THE BUILDERS' JOURNAL.

ASHTON-UNDER-LYNE.

SIR,—In Mr Ramm's article in No. CCLII. of THE BUILDERS' JOURNAL it is claimed that the *true* form of the curve is obtained by his method. This statement so directly made, and so opposed to accepted theories and facts, at once challenges trial and criticism. Any draughtsman can, as I have done, easily prove for himself that Mr. Ramm's construction does not effect what he claims it to do. The actual result is simply an eight-centered curve somewhat resembling an ellipse, and that is all. As such, the construction is ingenious. Mr. Ramm, in his reply to Mr. Marsden (whose remarks I entirely endorse), dubs all older accepted methods as approximate, and he is, I think, not justified in doing so. The method of drawing the figure by finding points in the curve, using intersecting arcs and the two foci, is as correct and certain as the methods in use for any regular geometrical figure, not even excepting the simple square. The degree of accuracy is simply dependent on the ability of the draughtsman and not on the method at all; whereas Mr. Ramm's construction is wrong in principle, *i.e.* his curve suddenly alters in sweep or curvature at eight different points, whilst in the true ellipse the curvature is changing continuously from the flattest to the sharpest portions, and no portion of it can consequently coincide with an arc of a circle.—Yours truly

J. A. PERCIVAL.

To the Editor of THE BUILDERS' JOURNAL.

NEW CROSS, S.E.

SIR,—At first I thought I would not reply to Mr. Ramm's letter in your issue for December 20th, as it appeared to me that he was trying to shuffle off the demonstration, by which he could analytically prove the curve he described in your issue of December 6th to be a true ellipse. He said in that article that he would not give the analytical proof of his statement, and I think the reason is because he could not if he tried to. I am sure that many students of geometry would be only too eager to use Mr. Ramm's "Method of Drawing Ellipses" if a proof of its correctness was forthcoming; so once again I ask him to kindly give it.

I will allow that the result of drawing a curve by Mr. Ramm's method gives an exceeding good approximation to an ellipse, and that for most practical purposes it is an easy way to draw a curve approximating to the one usually drawn with the trammel, and it is a more useful method than the one usually used to set out a so-called semi-elliptic arch; this arch being in most cases more correctly described by the term, three-centred arch.—Yours truly, RUFUS E. MARSDEN.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"Seeing that engineering is distinctly an art of the present and future, and that both its materials and the principles and conditions of their employment are different from any which have hitherto been known; if it is ever to have any beauty of its own, or, to put it more hopefully, if its results are ever to be less objectionable than they are now, it must be by seeking for such results within the necessary conditions of its existence, and not by the addition or superposition of an utterly unsuitable style of ornament, drawn from past ages and a different order of things. In short, the exercise of ingenuity in works of pure utility must be made to occupy the place filled by decoration in ornamental design."
—SIR EDWARD J. POYNTER.

St. James's Court, Westminster. THESE buildings consist of residential flats, shops, and offices. The front elevation is carried out in Portland stone and Bracknel red bricks, and the elevations round the courtyard are in Flemish Renaissance freely treated. The three lower storeys are to be carried out in Messrs. Doulton's faience; above this will be a rubber brick frieze, to be carved with Shakesperian subjects. The entire construction of the walls, partitions, floors, and roofs is of fire-resisting material. Great care and attention has been given to the means of escape from the upper floors in case of fire, by providing balconies and iron staircases outside each block. The buildings are arranged round a central square courtyard, and in the centre building on the ground floor, approached by a main entrance from the front, are the public rooms, consisting of a salle-à-manger, restaurant, billiard-room, smoking room, and readingrooms. On the floors above the rooms are arranged in various sized suites, all approached by passenger lifts provided by Messrs. Waygood. The handsome wrought-iron gates to the courtyard have been supplied by Messrs. Starkie Gardner and Co. Electric lighting throughout will be by Mr. G. Vaughan Fowler, of Longbridge, Warwick; the stoves and chimney-pieces by Messrs. Ashton and Green, Messrs. Yates and Haywood, and Mr. John White, of Bedford; the plumbing and sanitary work by Messrs. Beaven and Sons, of London and Gloucester. Our illustrations (see inset sheet) are taken from drawings lent us by the architect, Mr. C. J. C. Pawley, of 25, Victoria Street, S.W.

A Newly-Found Roman Villa. A ROMAN villa has quite recently been discovered at Brislington, Bristol, in connection with the formation of a new road. On entering the field from the road the visitor will notice large heaps of ancient building *débris* thrown out by the excavators, consisting chiefly of stones of various sizes, of pennant grit, lias, and Dundry limestone, some of which have apparently come from the walls of the villa and the paved roads near it. In the sections of surface soil, layers of ancient mortar may also be seen, together with wood ashes, from which may be extracted fragments of the well-known common black ware which always accompanies Roman remains in this country. Near the centre of the field there is exposed a considerable portion of the tesselated pavement of the rooms of the villa; these are composed of small cubes of red tile and blue and white stone set in cement, and arranged in pleasing and intricate geometrical patterns, while lines of larger cubes of brown pennant grit form borders to the compartments, and appear to form the pavement of narrow passages between the rooms. There are probably hollow chambers beneath the floors for the passage of hot air with which the rooms were heated in winter time. Scattered around the pavements may be seen a large number of roofing tiles, formed of thick slabs of pennant grit carefully shaped, each with a nail hole in the corner for attachment to the roofing timbers, very similar in form to those in use in various parts of the country at the present time. There are also some large worked blocks of Bath or Dundry freestone, some of them channelled for water. The visitor will also notice one of the common flat Roman bricks, 11in. square and 1¼in. thick. From the presence of burnt roofing tiles, and discoloration on the white portions of the pavements, it may be assumed that the building was destroyed by fire, a fate common to the Roman villas in Britain. "The discovery of this villa," says Mr. F. Ellis, of Bishopston, "is an additional proof of the fact that over the whole of our district in the Roman period there were scattered habitations in little clearings in the forest, in touch with each other by roads wide enough for the passage of ox wagons, and leading by wider paved highways to the great Roman centre at Bath."

A Vile Street.

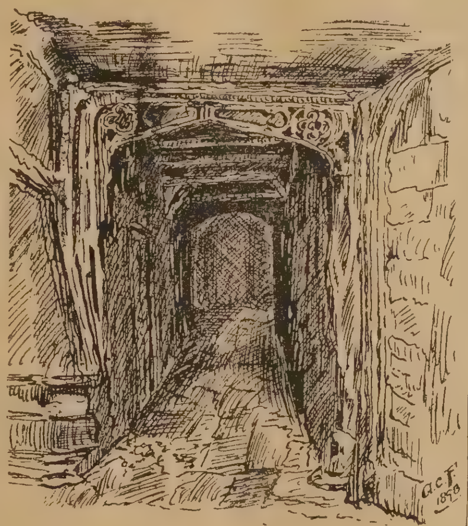
THERE are some spots in every city which seem to attract the dregs of the population, exhibiting in a ghastly manner all that is squalid and brutal in the life of a community. New York has its Allen Street—a short, dark, ugly thoroughfare, only eight blocks long, entirely under cover, and screened by "the hideous structure of the elevated road." It looks like a dog kennel, into which human beasts may creep and shelter themselves when hunted and driven to earth. Here they may make their final stand, and perish in the last ditch of vice and crime. What is most remarkable about Allen Street is that it is literally fenced in and hedged about by the very institutions that are supposed to be redeeming the world—the public schools and the reform associations. But these institutions seem to have no effect on the viciousness of the place. The Society for Ethical Culture has devoted itself to the legal aspects of the problem, and is now trying to see if the law does not offer some relief to the terrible conditions. It were well for any city to have such a plague spot wiped out.

The Chinese Exhibit.

IT is proposed to make the Chinese section of the Paris Exhibition specially attractive. The arrangements are under the control of Sir Robert Hart and the Maritime Customs, there being only one private exhibitor, a well-known curio dealer from Pekin. An officer of the Customs, M. Vapereau, has been in Paris for some months past getting the section into order. The position is not a central one, for it is in the gardens near the end of the eastern wing of the Trocadéro, but the slope of ground and the large trees afford an opportunity for effect, and the view across the river from beneath the trees to the Eiffel Tower, will make the place a favourite resort during hot weather. There will be a four-storeyed pavilion, 60ft. high, covering about 400 square yards, with a lake in front. One of the floors of the pavilion will contain a Chinese theatre and restaurant, while the exhibits will take up two of the floors. There will be three smaller pavilions, and a row of Chinese shops with men at work. The Siberian section comes next to the Chinese, between them being a Siberian railway train with a model of the Pekin terminus at one end and that of Moscow at the other, while a moving panorama of Siberian and Manchurian scenery along the line will complete the illusion.

London and Paris.

THERE is one thing in Mr. Charles Whibley's article in "Macmillan's Magazine" on the streets of London and Paris with which we cannot agree. He says that the first impression one gets of our capital is that of silence. "No cobbles persuade the cart-wheels to a restless rattle; the tyres of the cabs roll tranquilly over wood or asphalte; the foot-passengers hustle by in business-like quietude, or they greet one another without gesture and without effusion. In Paris, all is movement, bustle, and joyousness; nobody is in a hurry, yet everybody flashes his hands and his tongue at the same rate. The one city is silent with haste, the other is noisy with a nonchalant leisure." Though no one could dispute the reflex in the individual of the national characteristics of the two countries, we cannot carry this to such an extent that it makes the capital of the silent Britisher silent itself; is not the reverse very much more the fact? All harmony-loving citizens will agree with what Mr. Whibley says of the illuminated night sign, which still remains objectionably prominent despite all the attacks that have been made with the view to its abolition. They wink, they shift, they scintilate, they go out. Now yellow plays on red; now darkness pockets all the colours, and the passer-by is not only distressed by these sudden apparitions, he is even prompted to the cultivation of a new vice. As his cab rushes by the illuminated spot he will hazard all the money in one pocket against all the money in another that the red light will not flash again until he is swept off out of sight." A return to London is, in our author's opinion, a return to sombre walls and ugly hoardings, which makes the regret for Paris all the sharper. Nor is it only on her walls that London exhibits her dinginess. She is duskier than of yore, and the houses are growing loftier and are casting longer shadows. The passion for flats, combined with the greed of landlords, is more resolutely excluding the sun from our streets. London ought always to remain a city of low houses. The tall flats of London, then, exclude the sun, and, being built of materials which absorb rather than reflect the light, increase the gloom of city and suburb alike. But the folly of councils and architects cannot abolish the immemorial grandeur of our capital. While Paris is touched with the finger of beauty, London preserves intact her ancient character.



ENTRANCE TO NO. 3 COURT, NORTH STREET, TAUNTON, SOMERSET. SKETCHED BY ALBERT C. FREEMAN.

A Picturesque Slum.

ON this page we illustrate the entrance to some slums off North Street, Taunton. It is built of wood, and is fast decaying as will be seen. The carved and cut head of the doorway is of very good workmanship. As far as can be gathered it is the remains of an old building. The drawing is by Mr. Albert C. Freeman, of Clapham, S.W.

Bell-Hanging Extraordinary.

ONE does not expect to find a church bell up a tree, yet there is one in the parish of Therfield, Herts., which occupies this unique position. More than twenty years ago the church was rebuilt, and altogether, including the rebuilding of the chancel, for which the rector was responsible, a sum of £5,487 was spent on the work. There were not, however, sufficient funds to complete the rebuilding, and the upper portions of the tower and church remain unfinished to the present time, about £1,000 being required for completion. As there was no belfry in which to place the bells, one was hung on the branch of a large walnut-tree in the Rectory Close, adjoining the churchyard.

More Fire Tests with Glass.

WE have already given accounts of glass tests made by the British Fire Prevention Committee; those most lately conducted have been with three casements, one glazed with ¼in. plate glass, one with 32oz. sheet glass, and one with lead lights. Within 6 minutes the flame burst through the 32oz. sheet glass casement, and the whole had fallen within 12½ minutes. The lead glazing collapsed after 7 minutes, and within 12 minutes the flames passed through the ¼in. plate glass: within 14 minutes the latter had fallen. The idea was to record the effect of a thirty minutes' fire test, but, as shown, all the casements had collapsed within half that time, and water was therefore not applied, as had been originally intended. From the foregoing it will be seen that the casements glazed with plate glass withstood the fire longest.

President Kruger's House.

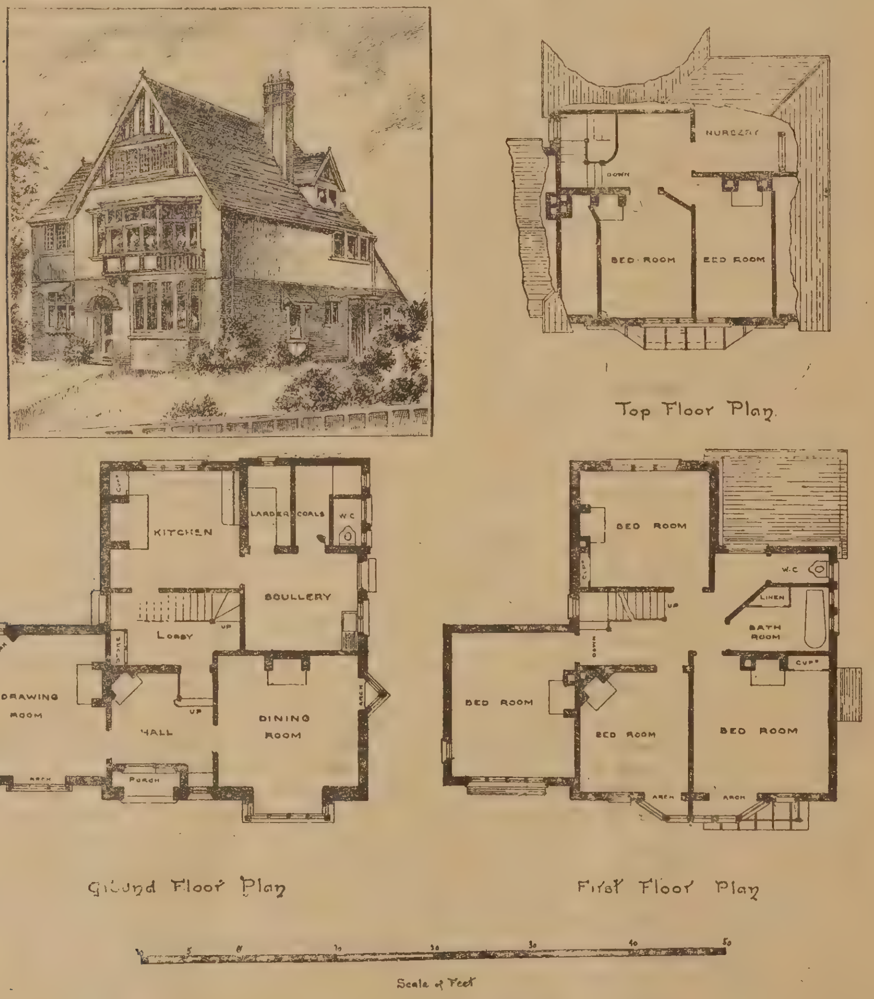
PRESIDENT KRUGER'S house at Pretoria is the usual bungalowed building, with the hideous zinc roof which one sees throughout South Africa; and, though doubtless comfortable, it cannot be termed beautiful. The Stoep, where Oom Paul is said to conduct so many interviews, runs straight along the front of the house, and there is the inevitable flight of shallow steps, widening in a generous outward sweep as they reach the ground, which one may see in nine houses out of ten at the Cape. Below the steps, on each side of the entrance, are the stone lions which Barney Barnato presented to the President—one hopes with no intention of sarcasm, but the effect of Paul Kruger's house guarded by a possibly British lion is inevitably suggestive. These handsome stone beasts are the only unusual addition by which to distinguish the Presidency from a score of other buildings like it. The scaffolding still remains surrounding the pedestal on which the President's statue is to be placed. On October 10th (President's birthday, a public holiday), according to previous arrangements, the statue was to be placed in position and uncovered, with due solemnity, in Presidential presence. Needless to say, this function has not been carried out yet.

Carthage.

THE ancient citadel of Carthage, on Byrsa Hill, was not identified till the beginning of the present century. "Travel" says that since then numerous excavations have revealed vestiges of the old cisterns, amphitheatre, temples, baths, and palaces, Phœnician tombs many feet below the surface, curious mummified remains and rich funeral ornaments, and Roman sepulchres of later date containing urns filled with ashes. Recent research during the past few months by a French antiquarian society has revealed the remains of the old heathen sanctuary dedicated to Jupiter Ammon. It is situated in the most important region of Carthage, and the cutting made exhibits several successive steps in civilisation. Just below the soil fragments of lamps, mosaic, coins, and pottery, were found, and still lower Byzantine tombs, on one of which appears a very common Christian epitaph, "Fidelis in pace." Below these is a Roman dwelling containing a beautiful white marble colossal head of Marcus Aurelius. A cistern in the middle of the habitation gives evidence of having been supplied by some great public reservoir. South of these are two rectangular rooms paved with mosaic, and in wonderful preservation considering the lapse of time. On removing the mosaics a staircase was discovered leading to a hall which had evidently been elaborately decorated. Here have been found Christian lamps bearing the impression of fish, of palm trees, and of the Cross, and also mutilated marble statuettes of Pagan divinities and the crowned mask of a goddess. At the end of the hall is a large marble slab bearing the inscription to Jupiter Ammon, and dedicated by twelve priests and a woman, who seems to have held the position of chief priestess. Near by were found four statues, rather more than 3ft. in height, almost intact, and finely chiselled in white marble. More interesting to many archæologists even than this heathen temple are the Punic tombs many feet underground, in which have been found wine jars, grain, rings and necklaces, and coins dating back to more than 1,000 years before Christ.

Professional Practice.

Aberdeen.—The new administrative block which has been added to the City Hospital is from designs by Mr. John Rust, the city architect; it has cost £5,000. The principal feature of the front elevation is a central clock tower rising to a height of 57ft. The block is 100ft. square. On the ground floor there are reception and departure wards, with bath rooms between each for the use of patients entering and leaving the hospital. There are also eight bedrooms for the use of nurses, a number of whom formerly had to be accommodated outside the building. On the first floor there are eighteen bedrooms for the accommodation of nurses, wardmaids, and laundrymaids. A dining room, 20ft. by 14ft., has been provided in the new block on the ground floor, and in the old block adjacent a nurses' sitting room has been formed by converting two bedrooms into one large room. All the latest sanitary appliances have been used in connection with the construction of the block, which is heated by steam pipes and radiators.



Top Floor Plan.

Ground Floor Plan

First Floor Plan

HOUSE AT UNDERHILL PARK, REIGATE. C. E. SALMON, ARCHITECT.

Dundee.—A new church has been built by the Park United Presbyterian congregation at the corner of Park Avenue and Morgan Street from the designs of Mr. Leslie Ower, F.R.I.B.A., at a cost of £3,200. The elevation to each street consists of a gable having three heavy butresses and two double-light traceried windows. The main entrance is under the tower, which is 87ft. high to the top of the finial. The style of architecture is Early English, and the building is of blue Forfarshire stone, the hewn work being angle scabbled and the rubble dabbed. The interior is octagonal on plan with concentric seating, and the floor is sloped towards the pulpit, which is set on a large choir platform in a recess surmounted by an arch; in the gable above there is a large, richly-coloured wheel window with tracery. The roof and ceiling are entirely of wood, the couples being of massive timbers with moulded hammer beams and heavy drop ornaments. There is a vestry, ladies' room, engine room, and lavatories at the back, and the heating chamber is underneath the church. The heating is by small-bore pipes, and boxed-in coils are placed in the window breasts, with fresh air inlets to insure a supply of fresh warm air without draughts. The windows are filled with leaded cathedral glass in delicate tints, and the seats are of pitch pine stained a greenish colour and varnished. The walls in the upper parts of the four gables are a primrose colour, and a deep bold stencil band runs across each gable at the level of the wooden cornice. The colour on the main body of the walls above the gallery is a rich salmon shade, lined out in bands, while under the gallery the shade is chocolate. The pulpit gable is richly treated in stencil work, and in the pulpit recess the colour is a fine shade of dark red with gold stencil ornament. The windows are treated in a grey colour, with stencil bands in shades all round. The church is seated for 680 persons. Mr. William Bennet was the contractor for the mason work.

London.—There has been erected in the Aldersgate Garden, by Mr. G. F. Watts, R.A., a memorial "cloister," on the wall of which he proposes to record the heroic deeds performed from time to time by ordinary people in the ordinary walks of life. It consists of a red-tiled roof sloping down from the wall to a height of 7ft. from the ground, and supported by seven pillars. The floor is about 7ft. wide, and is also tiled red. The distance covered is rather more than 50ft., and a seat of this length will stretch along the lower extremity of the wall. Above the sloping back of the seat the space is divided into six portions by piers formed of brown glazed bricks. Each portion is divided horizontally into six sections, and it is in these spaces that the memorials will be inserted, probably in the shape of marble tablets.

Perth.—New premises for the Royal Bank of Scotland are in course of erection at the north-west corner of the High Street and New Kinnoull Street, almost opposite the Post Office. It has a frontage to High Street of 53ft., and towards Kinnoull Street of 120ft. The bank premises are to be in the corner on the ground floor, and consist of a telling room, 34ft. by 28ft.; agent's room, 16ft. by 15ft.; and fireproof safes, lavatory, and other conveniences. The remainder of the block on the ground floor in Kinnoull Street is to consist of three large double shops, with saloons behind if required. The building is four storeys in height. The upper storeys are in the meantime being arranged as a suite of solicitors' offices; but they are being so constructed that they can be converted into dwelling-houses if found necessary. The design is in the classic style. The ground floor of the bank has arched windows and an angular doorpiece with granite columns and arched pediments. The shop fronts are lofty, and will be finished in a modern style with teak wood. The first floor windows have Corinthian pilasters and pediments over them. The corner building is to have a cantilever cornice, with balustrade and pedimented attic windows, surmounted by a high mansard roof; and the whole building is to be provided with fireproof floors. Mr. David Smart, of Perth, has prepared the plans.

Reigate.—The house which we illustrate on this page has been erected upon undulating ground at the foot of the North Downs, near Reigate, and commands extensive views—south over the Weald, and west to Leith Hill and the fine bold curves of the Chalk Downs to Guildford. The lower portions of the house (and chimneys) are of local red brick, with cavity. Above the moulded brick string-course the walls are rough-cast and finished with small ballast, sand, and lime well mixed together, and slightly tinted with ochre. Portions are broken up with solid half-timber work, left rough from the saw, pegged together, and dressed with Stockholm tar. The tiles are red, sand-faced, and of Ashford manufacture, which weather quickly to a pleasing tone. The builders were Messrs. W. Bagaley and Sons, of Mead Vale, Redhill, and the architect is Mr. C. E. Salmon, of Bell Street, Reigate.

Holywell Street Demolition.—£40,000 was the amount of compensation in respect of the freehold interest in the Opera Comique Theatre, which Mr. Troutbeck and a special jury settled at the hearing of the case of Fowler's Trustees v. The London County Council. Claim was made for £60,000.

A New West-End Mansion.—The Duke of Marlborough is to revive the ancient glories of that illustrious dukedom by building a town house. The architects have already been selected and the site provided. This is to be on the ground occupied by Curzon Chapel, on the south side of Curzon Street, and between Chapel Street and Market Street. The elaborately carved oak pulpit has been presented to the parish church of Penn, in Buckinghamshire.

Views and Reviews.

QUANTITIES AND QUANTITY TAKING.

AN elementary work on quantity surveying suitable for the absolute beginner and dealing with the subject upon other than antiquated methods, has long been needed, and Mr. Davis appears to us to have met the requirements well. He is careful, while adhering to one system, to point out that several systems are in use even in London, and, as London practice must, presumably, eventually dominate the whole country, he is, perhaps, wise in making no reference to much more divergent systems of local application only, admirable though some of these undoubtedly are. Every surveyor will contend that his own is the best system. As to himself it probably is, but no two are likely to agree upon all points. A system, however, of "taking-off" which has much to recommend it, and which Mr. Davis does not mention, is that of dealing, firstly, with the items which lie flat upon the plan, such as surface excavating, floors, ceilings and roofs; then, with those standing vertically, including the walls with their excavation, foundations, damp courses, facings, openings, and the joiner's work connected with these, such as doors and windows; and, lastly, taking off the finishings. A very good point in the book is the insistence upon exactitude, for it is clearly wrong that quantities should be taken either "full" or "short," allowances for this or that labour omitted being but poor substitutes for correct dimensions and full descriptions. Another point, equally good, is the recommendation of references, such as allow every item to be subsequently identified if needed. The one weakness of the book lies in the examples of "taking-off" and "abstracting" given at the end having been set up in type instead of being photo-reductions of sheets used in practice; the result is that the crossing-off and ticking of the collections and of the transferences have not been shown. They are mentioned certainly, but the beginner requires to be shown such things, which are of the first importance, very clearly indeed. For these purposes, too, a greater use of variously coloured inks than there has been any mention of can often be made advantageously. A.

"Quantities and Quantity Taking." By W. E. Davis, surveyor. London: D. Fourdrinier, "The Builder" Office, 46, Catherine Street, W.C. Price, 3s. 6d., post free.

TWO ART MAGAZINE VOLUMES.

It is unnecessary for us to speak at length of the "Studio," this most popular of the monthly magazines, which deal with miscellaneous artistic matters. It shows no sign of falling off from the standard of general excellence it has long maintained. In looking through this volume we are particularly struck with the quantity given for the small price charged each month—several coloured plates being generally given in each number. Architecture is not overlooked, articles being included on Mr. Ernest Newton's designs for country and suburban houses and on Mr. Mortimer Menpes' experiment in the application of Japanese ornament to the decoration of his own house. Other articles of particular interest to architects are:—"The Work of Reynolds-Stephens," "Decorations for a Music Room," "A Modern Bath Room," and "William de Morgan and his Pottery." The illustrations are very well reproduced and printed on paper very suitable for the purpose; the plates in colour by the half-tone process are amongst the most successful we have seen.

The volume of the "Magazine of Art" forms a most sumptuous record of the year's progress in Art. As usual it is printed and illustrated in the best manner. The articles upon rising and risen artists form a prominent feature as formerly, and the section entitled "The Art Movement" contains a good deal of useful information and interesting descriptions of work of which we do not find a record elsewhere. The "Chronicle of Art" gives information which will have historical value in a few years. The reproductions in colours by the half-tone process are in most cases very successful. Mr. Halsey Ricardo contributes a most interesting and instructive article on the designing of town houses. We wish Mr. Ricardo's hints were more attended to by the clients, who, as he points out, will profess a knowledge of architectural matters of which they are entirely ignorant; it is not so much the fault of the architect that so much bad work is produced as the cheese-paring economy of their patrons. Mr. Starkie Gardner's article on the revival of handicraft in lead-working is useful and interesting to architects.

"The Studio." Volumn XVII. London: The Offices of "The Studio," 5, Henrietta Street, Covent Garden, W.C.

"The Magazine of Art," 1899. London: Cassell and Co., Ltd., La Belle Sauvage, Ludgate Hill, E.C.

BYZANTINE CONSTANTINOPLE.

Byzantine history, though little studied, is always fascinating, and Byzantine architecture, which has, perhaps, been even less studied, is equally interesting; while both do much to bridge over the gulf between the classical and modern epochs. We, therefore, welcome this new contribution of Mr. Van Millingen's, which treats, in a measure, of both subjects, and contains much hitherto neglected material. At the same time, the leading title of the book is rather misleading, for, as the sub-title indicates, it is only a portion of the Byzantine remains that is here described, while the historical side of the book is limited to those events which can be connected with the walls and their immediate vicinity. In short, one is led to expect a general treatise on mediæval Constantinople, which it proves not to be; but we trust that, as a hint in the preface seems to imply, this is only a first volume, and that it will be followed by others dealing with the churches and the general topography of the city.

The author's general aim has been to identify the historical sites with the view of making the events more intelligible and vivid. His work claims to be in the main a fresh and independent investigation, with constant appeals to the original authorities, and he has personally examined with the greatest care all the localities concerned. As a Professor of History in Robert College, he has the advantage of living on the spot, and deriving therefrom all the aid that the *genius loci* can afford.

After two introductory chapters dealing with the geographical limits of the ancient city, and the arrangement of the present one, we are personally conducted (so to speak) round the walls in order, ending up with the shores of the Golden Horn and the Sea of Marmora. There is an excellent key-map of Byzantine Constantinople, which, for the average reader, obviates pages of description; and more valuable, though less interesting to study by itself, is an elaborate map on one plate, giving the whole extent of the land walls built by Theodosius, by means of which the author's course may be more easily followed.

Roughly speaking, there are three walls encircling the city, the first enclosing the ancient Byzantium on the end of the promontory; next, the wall of Constantine to the north-west, increasing the area of the city to five or six times its original size; and, finally, the Theodosian walls, stretching almost in a straight line for more than three miles from north-east to south-west, and almost doubling again the area of the city. To judge by the photograph facing p. 46 they must be most imposing in character, with their battlemented towers at frequent intervals, and their stupendous masonry.

Mr. Van Millingen has evidently read up his historical authorities, dreary chroniclers as some of them no doubt are, with great care and diligence, and he has chapter and verse for every statement. He points out, however, that many questions cannot be definitely settled until excavations are permitted. His handsome and erudite volume should be carefully studied by all interested in the subject.

H. B. W.

"Byzantine Constantinople: the Walls of the City and Adjoining Historical Sites." By Alexander Van Millingen, M.A. London: John Murray. 1899, Price 21s.

New Patents.

These patents are open to opposition until February 6th.

1898.—Artificial Marble and Granite.—25,155. T. W. JAMES, Smethwick, Staffs. For statuary or white marble, 65lbs. of calcined chalk, 6lbs. of mica dust, 4lbs. of ground borax, and 5lbs. of soluble silicate are mixed with hot water and run into moulds. When half dry, the surface is impressed with imitation veins, which are afterwards filled with oxide of manganese and slag. The surface is then worked off smooth. The invention also includes recipes for making imitation black-veined or Bardilla, green or Kilkenny, and Devonshire red marbles, and Aberdeen and Portland granites.

Skirting Heaters.—25,335. T. SCOTLAND, Glasgow. Instead of employing pipes, either bare or covered, the skirting itself forms the conducting medium. It may be of cast-iron or other metal, either in one piece or in several pieces, and is divided into two or more compartments. It is claimed to be much neater and cleanlier than ordinary heating pipes.

1899.—Lock and Pulley Casings.—1,828. S. and J. WILKES and W. J. GOODMAN; all of Bloxwich. A metal blank having a somewhat cross-shaped form is taken and bent up into the shape of the letter U. The bottom portion is them stamped flat, different portions are turned over, and perforations are made; the result being a lock or pulley case made entirely out of one piece of wrought metal. The idea is to greatly cheapen the cost of manufacture.

Hollow Bricks.—2,128. B. ROBINSON, Church Greseley, Derbyshire. The object is to make a glazed brick or tile as light as possible, and to dispense with the ordinary method of pressing. The machine is like an ordinary sanitary pipe machine, the clay being fed downwards through a die. On the die plate are a number of half moulds, and fitting on these are depending pieces fixed to a cross bar. When the mould has been filled and operated a brick is produced which is hollow and has internal strengthening ribs. It is very light and requires less heat for burning than an ordinary brick.

Scaffoldings.—16,266. H. Göttsch and C. Fehrs; both of Germany. The stage consists of two metal end frames connected by top battens and a flooring. It is suspended by tackle from pulleys working on a beam at the top of the building, and in the flooring is a hole fitted with a trap-door. Through this a bucket can pass when required, the sides of the hole being fitted with rollers to prevent the rope chafing. Rollers are also provided on the stage to run against the face of the wall.

Chimney Cowls.—19,973. W. WHITEHEAD, T. HARRIS, and H. C. SACRE; all of Manchester. Fixed to the top of the chimney pot is a tube having a crossbar, bent upwards, at the top. To this crossbar is attached the oil-cup, which contains the fork that supports the hood. This is shaped like a short cone and has an universal joint, so that it will tilt with the wind and cover the chimney mouth, so preventing downdraught. A spiral ventilator is combined with a hood in a modification of the invention.

Pencil Attachments.—21,641. G. D. RODDA, London, N.W. Removably fixed on the top of the pencil is a metal cap having pricking points, these being protected, when not required, by a cover. Any number of points can be used, according to scales, and several methods are mentioned for attaching them to the head.

Pipe Cleaners.—21,683. A. J. BOULT, London, E.C. (*F. Navotny and O. Mierisch; both of Germany*). A solid oval-shaped body with a smooth surface, a similarly-shaped body having cutting knives and a brush—these are connected with links one behind the other and driven through the pipe by compressed air, steam, or water. The first acts as a piston, the second cuts up the deposit on the pipe, and the third brushes it off. It is said that cleansing with this apparatus is very rapid and efficacious.

The following specifications were published on Saturday last, and are open to opposition until February 13th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898. — 26,375, Maës, apparatus for checking workmen's times. 26,600, Smith and Scruton, endless block tackle for raising, lowering, and hauling heavy weights, driving cycles, machinery, and for all other like mechanical purposes. 26,732, Purvis and Purvis, apparatus for manipulating metal baths or other articles inside and outside furnaces during the process of enamelling. 27,049, Shurmer, wood working machine, the same being also applicable for use in the cutting and shaping of metal. 27,329, Monplot, public lighting apparatus. 27,509, Himes, nut locks.

1899.—Holman, means for securing the lids of gas retorts, applicable also for securing other lids, flaps, doors, and the like. 477, Brockelbank, fastenings. 741, Hellyer, under - water - line water closet. 1,487, Davidson, electric light wire casing. 1742, Heaton and Dugard, manufacture of casements and their parts. 2015, Cranstone and Archer, hydraulic lifts. 2140, Cree, apparatus for bolting or locking waggon or other doors or gates. 2714, Edge and Mangnall, instrument for ascertaining or indicating the shape of the wearing surface of tram rails or other surfaces subject to wear or being operated upon. 2731, Warwick, structures for playing grounds and pleasure resorts. 2742, Bowles, electric floats for theatrical purposes. 2769, Hellyer, water closets, slop sinks, and the like. 2848, Smith, manufacture of varnish. 2924, Beard, tell tales or checking devices for watchmen, workmen, servants, and the like. 3066, Shanks, waste or discharge valve of sinks, washing vessels, baths, lavatories, and the like. 3210, Curtin, plug or wedge for fixing flashing of buildings and other structures. 3350, Lockley, latches. 15,014, Cox, interlocking roofing tile. 16,050, von Porell, process for the production of Portland cement from blast furnace slag and lime and the like. 18,587, Offenbacher, process of manufacturing decorated glass, glass lenses, hollow-ware tubes and other articles, and machinery therefor. 19,658, Boyd, hot closet fitted to a domestic fireplace (for burning coal and other fuel) for cooking or for keeping plates, food, and the like warm. 19,660, Boyd, open fire stove for burning anthracite or other smokeless fuel. 20,035, Donnelly, screening apparatus. 20,099, Powers, means of automatically supplying water to fire hoses. 20,283, Bachmann and Caracristi, air-heating furnace for drying casting boxes or moulds. 20,416, Hindmarsh, drain gratings and the like. 20,796, Barnes, window sashes, shutters, and the like. 20,801, Wise (*Empire Engine and Motor Co.*), hoists. 21,230, Bailey and Stevens, pipe couplings. 21,752, McCartea and Lester, nut locks. 21,814, Lebioda, process for preserving wood. 21,921, Hutton. carbonising and obtaining of products from precipitated sewage sludge.

A Memorial Window at St. Martin's Church, Leicester, has been unveiled in the Military Chapel. It is by Messrs. Clayton and Bell, of London, and is in memory of the late Colonel Reader.

Mr. John Spink, of Sheffield, has lately died. He was secretary of the Sheffield Master Builders' Asssociation and president of the Yorkshire Federation of Building Trade Employers, and was actively engaged in the lengthy dispute which terminated in July last.

At Canterbury Cathedral it has been discovered that the recess in the north ambulatory of the presbytery in which the chained Bible lies was the site where in pre-Reformation times the Easter sepulchre was deposited during Holy Week. The alteration was doubtless the work of Archbishop Cranmer.

Keystones.

Professor Maspero has been appointed to the Directorship of Antiquities in Cairo.

An Architectural Library is to be formed in connection with the Three Towns Architectural Society.

The Great Yarmouth Master Builders' Association recently held its second annual dinner, when the Mayor (Mr. B. H. Press) presided.

Mr. G. F. Watts, R.A., who is now at Limnerslease, near Guildford, is nearing his eighty-fourth year. He has been in somewha uncertain health lately.

Mr. H. P. Fletcher, the son of the late Professor Banister Fletcher, C.C., J.P., has been elected a vice-president of the British Institute of Certified Carpenters.

An annual Rosa Bonheur Prize of £60, to be awarded to the most meritorious work at the French Salon, is to be founded through the generosity of Mlle. Anna Klumpke, the deceased artist's friend.

The English Church of St. John the Baptist at San Remo was destroyed by fire on December 26th. It is supposed that the fire was caused by a defect in the heating apparatus. The insurance amounts to £6,000.

Stepney Parish Church.—The total sum spent on the restoration and redecoration of St. Dunstan's is £5,000. Towards this sums amounting to £4,750 have been received or promised, leaving only £250 to be collected.

A Memorial to Alphand the Architect, by M. Dalou, has been unveiled in Paris. It is not so important as Dalou's work "The Triumph of the Republic," but it is very realistic and is treated with great technical decision.

The Glasgow School of Art is now housed in a new building at the corner of Renfrew Street and Dalhousie Street; the school was started about 140 years ago by the brothers Foulis. Messrs. Honeyman and Keppie are the architects for the new building.

Messrs. Elliston and Carell's Premises in Magdalen Street, Oxford, are being rearranged and enlarged at a cost of over £10,000, and, when completed, will be the finest shop in the city. Mr. Herbert Quinton, of 22, George Street, Oxford, is the architect.

Workmen's Dwellings at Edmonton.—On the ground that it would involve them in an expenditure of £100,000 for the erection of workmen's dwellings, the Edmonton District Council have declined the offer made by Sir Samuel Montagu, Bart., M.P., of twenty-five acres of land in the parish.

Baths at Dunfermline.—In 1877 Mr. Andrew Carnegie presented baths to the burgh of Dunfermline (his native town) at a cost of £5,000, and since the opening Mr. Carnegie has spent about £2,000 on reconstruction work. He now expresses his desire to spend £20,000 more on baths and a gymnasium.

Labourers' Cottages for County Wicklow.—A Local Government Board inquiry has been held into the three schemes formulated by the Rural District Councils of Baltinglass under the Labourers' (Ireland) Acts for the purpose of providing a large number of new cottages (as well as acquiring existing cottages) and to provide half-acre allotments to them.

The Capuchin Monastery at Amalfi.—The Capuchin Monastery at Amalfi, which was lately destroyed by a landslip, was of great historical interest. Built for the Cistercians early in the thirteenth century, it contained some remarkably fine cloisters and arcades. Having fallen into ruin through a landslip in 1498, it remained uninhabited until 1583, when it was handed over to the Capuchin friars, who retained it until 1869, when the present Government converted it into a normal school. The monastery has often been made the subject of well-known pictures, which show what superb views were commanded from the beautiful Gothic ambulatory of Amalfi and the neighbouring coast.

Book Plates are a spreading fashion.

A Refuse Destructor is proposed to be erected at Brighouse.

A new Pulpit at Wyke Parish Church was dedicated on Saturday last.

Mr. James Deas, C.E., resident engineer to the Clyde Trust, died on December 29th.

A destructive fire at Salem Congregational Chapel, York, broke out last week. It is supposed to have been caused by an overheated flue.

The Gas Trades' Exhibition is now in full swing at the Royal Aquarium, Westminster, S.W.; it remains open until January 23rd. About fifty firms exhibit.

Windsor Weir.—The central portion of the footbridge at Windsor Weir suddenly collapsed on Saturday, owing to the failure of some of the supporting woodwork.

The Church of the Holy Cross, Cardiff, was destroyed by fire last week, the outbreak being attributed to the heating apparatus. The damage amounts to £2,000.

Searchlights for the New York fire brigades are to be provided, to assist them in their work. They will consist of two 18in. lenses and electric light plant carried on a small waggon.

Drury Lane Theatre.—The production of the pantomine this year has been facilitated by the extensive new paint room, ballet room, carpenters' shop, and wardrobe rooms, recently erected at the east end from designs by Mr. Philip E. Pilditch.

New Workhouse at Hunslet, Leeds.—The Local Government Board have approved the plans for the proposed new workhouse at Hunslet, with the exception of the block for imbeciles and epileptics. The total cost is estimated at £61,000.

Glasgow Exhibition Chairmanship.—The difficulty in regard to the chairmanship of the Executive Committee of the Glasgow Exhibition has been solved by the resignation of Sir David Richmond and the appointment of Lord Provost Chrisholm.

Art Exhibition in Paisley.—The twenty-fourth annual exhibition of the Paisley Art Institute was opened last week. The exhibits number 324. As usual, a prominent feature is made of loan works, which this year include works by Sir John Millais, Sir John Gilbert, Ettz, Sam Bough, Sir Nathaniel Dance, and Orchardson.

The Holy Well in Holywell Street.—Messrs. Anley and Son, builders, Dalston Lane, N.E., writing to the "Daily News," state that when making some alterations to one of the houses in Holywell Street in 1877 they found a beautiful well 7ft. underground, the water in which was very clear and good. They covered it with stone slabs and concreted over.

Big Building Scheme at Batley.—The Batley Corporation last week passed plans for the erection by the local Co-operative Society of eighty-eight working-men's dwellings on a site on the Bradford Road. The scheme will entail an outlay of over £20,000. The dwellings, when built, will be sold to the members of the society on the easy payment system.

Large New Buildings at Newcastle-on-Tyne.—It is proposed to erect a building containing shops and offices next to the National Provincial Bank at the top of Dean Street; a high block of buildings on the old Milk Market site, Quayside, for the Co-operative Wholesale Society; and a large warehouse for Messrs. Spillers and Bakers, Limited, opposite their steam mills in the Close.

King's College Classes.—The Carpenters' Company, in conjunction with the Council of King's College, announce in another column the reopening of their evening classes next week at King's College. It has been found necessary to rearrange the classes somewhat, in order to admit those students who were unable to join last term owing to the classes being full. Even with the changes made, it will be advisable for intending students to apply early, as there are not a large number of vacancies.

New Companies.

Leeds Contract Company, Limited.

This company was registered on December 7th by the Solicitors' Law Stationery Society, Limited, 12, New Court, W.C., with a capital of £10,000 in £1 shares, to carry on all kinds of promotion business; to construct and maintain, or assist in the construction and maintenance of public and private works, and to carry on the business of contractors, engineers, carriers, shipowners, &c. The first directors (to number not less than two nor more than five) are J. W. Close, G. Dove, S. W. Meyer and E. Sisterson (all permanent).

Northampton Estates and Improvement Corporation, Limited.

This company was registered on December 12th by Hutchinson and Cuff, 47, Chancery Lane, W.C., with a capital of £20,000 in £1 shares, to adopt an agreement with S. S. Campion for the acquisition of certain land and property, and to carry on the business of builders, architects, surveyors, &c. The first directors (to number not less than three nor more than seven) are G. Bruford S. S. Campion, J.P., W. S. Cuff, G. Ellard and Major F. Sheffield. Qualification, 200 shares. Remuneration, £35 each per annum (£10 extra for the chairman) and a share in the profits. Registered office: 7, St. Mildred's Court, E.C.

J. and H. Smith, Limited.

This company was registered on December 13th by Lawrence, Graham and Co., 6, New Square, Lincoln's Inn, W.C., with a capital of £30,000 in 3,000 £5 preference shares and £15,000 £1 ordinary shares, to acquire and carry on the business of furnishing, builders', artistic and general ironmongers, locksmiths, &c., carried on at 11-12, New Briggate, at 7, Mark Lane and at Belgrave Ironworks, all in Leeds, under the style or firm of J. and H. Smith, and to adopt an agreement with H. Smith. H. Smith is the governing director, with £300 per annum, and may retain office so long as he holds £2,000 shares. The other first directors are J. E. Smith, R. P. Smith, W. H. Smith and T. Hannam. Registered office: 11, New Briggate, Leeds.

Cunliffe's Kettering Brickworks, Ltd.

This company was registered on December 14th by Witherby and Co., Newman's Court, Cornhill, E.C., with a capital of £15,000 in £10 shares, to acquire and carry on the business now carried on by W. Cunliffe at the Northfield Steam Brickworks, Kettering. The first directors (to number not less than three nor more than five) are W. Cunliffe, H. F. Henson and W. P. Symonds. Qualification, £500. Remuneration, £100 per annum, divisible.

Italian Building and Trading Co., Ltd.

This company was registered December 12th by Clements, Williams, and Co., 17, Gresham House, E.C., with a capital of £50,000 in £5 shares, to take over and carry into effect concessions by the Corporation of the City of Licata (Sicily) for the construction of certain public works; to construct and maintain a new dry dock and engineering works, with patent and other slips, workshops, warehouses, plant, machinery, conveniences, piers, wharves, &c; and, further, to acquire any mines, mining, water and other rights, grants, leases, claims, concessions, options of purchase, metalliferous land, alluvial ground, mineral deposits, &c., and to carry on the business of a mining, smelting, and trading company in all its branches. The first directors (of whom there shall be not less than three nor more than eleven) are to be elected by the signatories. Qualification of first, £200; of subsequent, £100. Registered office, 9 and 10, Great Tower Street, E.C.

Steriken, Finnis and Sons, Limited.

This company was registered on December 12th by Speechly and Co., 1, New Inn, Strand, with a capital of £50,000 in £10 shares, to acquire the business of timber merchants, &c., carried on by F. Finnis, under the style of Steriken, Finnis and Sons. The first directors (of whom there shall not be less than three nor more than five) are F. Finnis and A. E. C. Lane. Qualification, £1,000; qualification of chairman (F. Finnis), 200 ordinary shares, his remuneration being £800 per annum. No remuneration of ordinary directors given.

Grimsby Brick Company, Limited.

This company was registered on December 19th by Shaw and Sons, Fetter Lane, E.C., with a capital of £10,000 in £5 shares, to acquire land, buildings, &c., and to carry on the business of builders' merchants, brick and tile manufacturers and vendors, quarry owners, coal and iron merchants, &c. The number of the directors and the names of the first are to be determined by the subscribers. Qualification, £50.

Mill Hill Slate Quarries Syndicate, Ltd.

This company was registered on December 19th by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £2,500 in £50 shares, to acquire the Mill Hill Slate Quarry, near Tavistock, Devon, to adopt an agreement with J. P. Ecles, J. B. James and C. E. Parsons, and to carry on the business of quarry and mine owners, slate merchants, &c. Registered without articles of association. Registered office: Central Chambers, Newport, Monmouthshire.

A. E. Wilson, Limited.

This company was registered on December 19th by T. Richards and Co., 44, Finsbury Square, W.C., with a capital of £2,000 in £1 shares, to acquire and carry on the business of a builder and contractor now carried on by A. E. Wilson at Northwood, Middlesex, and at Watford, Hertfordshire. The first directors (to number five) are to be appointed by the subscribers. Qualification, 100 shares. Remuneration as fixed by the company.

Lodge Holes Colliery Company, Limited.

This company was registered on December 19th by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £5,000 in £1 shares, to carry on the business of colliery proprietors, miners, coal merchants, coke manufacturers, brick and tile makers, &c. The first directors (to number not less than three nor more than five) are J. H. Smallman (managing director), S. Skidmore, H. Farker and I. Williams. Qualification, £300. Remuneration, £200 per annum for the managing director and £50 each for the others. Registered office: Bank Chambers, Wednesbury, Staffordshire.

David Chatterton and Sons, Limited.

This company was registered on December 15th by Maffey and Brentnall, 19, St. Dunstan's Hill, E.C., with a capital of £3,000 in £1 shares, to acquire the business carried on by Joseph Chatterton and William Chatterton, as David Chatterton and Sons, at the Granite Gritt Sett Quarries, Upper Mill, in the county of York, and to carry on the business of quarry owners &c. The first directors (to number not less than two nor more than five) are to be appointed by the subscribers. Qualification, 500 shares. Remuneration as fixed by the company.

Crewe Building Materials and Hardware Company, Limited.

This company was registered on December 21st by A. H. Atkins, Limited, 23, Bouverie Street, E.C., with a capital of £1,000 in £5 shares, to carry on the business of brick, stone, sand, lime, timber, and hardware merchants, carpenters, woodcarvers, electrical engineers, &c. The first directors (to number not less three nor more than seven) are C. R. Wooldridge, J. Bebbington, J. Griffiths, W. Micklewright and E. G. Smith. Remuneration as fixed by the company.

Trade and Craft.

HEAT AND AIR.

The most important advantages of the "Small Tube" hot-water heating apparatus made by Messrs. John King, Limited, warming, ventilating and lighting engineers, of Benson Street, Liverpool, are that the size of the piping (about 1¼in.) allows it to be introduced into all parts of the room or building; it is made of the best wrought-iron and can be bent neatly into all recesses; there is a great saving of fuel as compared with open fires, the cost being as 1d. to 7d.; and the apparatus is simple and maintains a uniform temperature. Part of the piping is arranged to form a coil, which is placed in a heater, and beyond putting a small amount of water in the pipes about once a month there is nothing to do except to clean out the ashes and keep up the fire. The apparatus is therefore very easy to manage, which is naturally a great desideratum in view of the fact that it might be in the hands of someone devoid of any knowledge of its working parts. C. Smedley Beck, Esq, Sandringham, writes to Messrs. King as follows:—"The hot-water heating apparatus as supplied and fitted up by you for H.R.H. Prince of Wales is a genuine success." In the "College" grates made by the firm there is a warming chamber at the back into which fresh air is admitted, and, after being warmed by the waste heat at the back and sides of the grate, is carried up through a flue and supplied to the room through a regulating louvre near the ceiling. Though this has the advantage of heating the room more efficiently than an ordinary grate, it possesses the disadvantage of all apparatus employing air flues or trunks namely, that if they are not periodically cleaned they will pollute the air that passes through them. Messrs. King also make a "Helios" hospital stove; a "Madeiran" stove for the combined warming and ventilation of churches, chapels, schools, &c.; a "Triumph King" heater; and "Peer" and "Peerless" warm-air stoves, which are of pleasing design. Of air-inlets and ventilators there is a great variety, the "Rex" invisible roof ventilator being made to the pitch of the roof, and thus being practically out of sight. The "Rajah" and "Rahnee" radiators made by the firm have a very good appearance and the castings are clean.

COMING EVENTS.

Wednesday, January 3.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.—Ordinary Meeting of members at 8 p.m.

Thursday, January 4.

CIVIL AND MECHANICAL ENGINEERS SOCIETY.—Mr. W. A. Francken, A.M.I.C.E., on "Well Foundations in India." 8 p.m.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: The Upper Limb."

Friday, January 5.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Lewis F. Day, on "Ornamental Design.—I."

ARCHITECTURAL ASSOCIATION.—(Discussion Section.) —Mr. V. H. King, on "The Public Monuments of London, architecturally considered."

Saturday, January 6.

SANITARY INSPECTORS' ASSOCIATION.—Extraordinary General Meeting at Carpenters' Hall, London Wall, E.C. New Year's Address by the President, Sir Hugh Gilzean Read, J.P., LL.D., D.L.

Monday, January 8.

LONDON INSTITUTION.—Mr. Alfred H. Fison, D.Sc., F.R.A.S., on "Photographs in Natural Colours." 4 p.m.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Professor Goodman A.M.I.C.E., M.I.M.E., on "Steel Construction in Buildings." 6.30 p.m.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—General Business Meeting. 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. Herbert Bryans on "Stained Glass."

Tuesday, January 9.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Sir C. Cameron, F.R.C.S.I, on "Pigments." 8 p.m.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS. —Mr. T. Walter L Emden, J.P., P.S.A., on "Suggestions for dealing with the Law as to Light and Air in Building Cases."

INSTITUTION OF CIVIL ENGINEERS.—Mr. Reginald A Tatton, M.I.C.E., on "The Purification of Water after its use in Manufactories," and Mr. W. O. E. Meade-King, M.I.C.E., on "Experiments on the Purification of Waste-Water from Factories." 8 p.m.

CURRENT PRICES.

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French	per cwt.	1 5 8	1 6 3
Colza Oil, English	per cwt.	1 4 9	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 8 6	1 8 9
Linseed Oil	per cwt.	1 2 1½	—
Petroleum, American	per gal.	0 0 7 3/8	0 0 7½
Do., Russian	per gal.	0 0 6 1/8	0 0 6½
Pitch	per barrel	0 8 6	—
Tallow, Town	per cwt.	1 4 6	1 8 9
Tar, Stockholm	per barrel	1 5 0	1 5 6
Turpentine	per cwt.	1 18 0	—
Lead, white, ground, carbonate	per cwt.	1 3 0	1 4 0
Do. red	per cwt.	1 0 4½	—
Soda crystals	per ton	2 17 6	3 0 0
Shellac, orange	per cwt.	3 2 6	—

METALS.

Copper, sheet, strong	per ton	82 0 0	—
Iron, bar, Staffs. in London	do.	10 0 0	11 2 6
Do. Galvanised Corrugated sheet	do.	15 0 0	—
Lead, pig, Spanish	do.	16 5 0	16 7 6
Do. do. English common brands	do.	16 15 0	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	18 10 0	19 0 0
Do. pipe	do.	19 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	do.	9 15 0	10 15 0
Tin, Foreign	do.	112 0 0	112 10 0
Do. English ingots	do.	116 0 0	—
Zinc, sheets, English	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	25 0 0	—
Do. Spelter	do.	20 3 9	20 8 9

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow	per load	4 7 6	6 5 0
Do. Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic	per fath.	4 10 0	5 10 0
Do. Petersburg	per bundle.	0 1 4½	0 1 5
Deals, Archangel 2nd & 1st	per P. Std.	15 10 0	20 5 0
Do. do. 4th & 3rd	do.	12 10 0	12 15 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	17 15 0	18 0 0
Do. do. 2nd „	do.	10 10 0	12 0 0
Do. do. Unsorted „	do.	10 15 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	8 0 0	16 10 0
Do. White Sea	do.	10 10 0	17 15 0
Do. Quebec Pine, 1st	do.	19 5 0	24 10 0
Do. do. 2nd	do.	16 10 0	—
Do. do. 3rd &c.	do.	9 5 0	9 15 0
Do. Canadian Spruce, 1st	per P. Std.	11 15 0	—
Do. do. 3rd & 2nd	do.	9 0 0	9 5 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	8 15 0	9 10 0
Flooring Boards, 1 in. prepared, 1st	per square	0 10 0	0 12 0
Do. 2nd	do.	0 9 6	0 11 0
Do 3rd &c.	do.	0 9 3	—

HARD WOODS.

Ash, Quebec	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4½	—
Do. Honduras	do.	0 0 4½	—
Do. Tobasco	do.	0 0 4½	—
Elm, Quebec	per load	12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0 0 5 1/8	—
Do. African	do.	0 0 4 1/32	—
Do. St. Domingo	do.	0 0 3¾	—
Do. Tobasco	do.	0 0 6	0 0 7½
Do. Cuba	do.	0 0 7 29/32	—
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks	do.	10 0	16 10 0
Wainscot, Riga (Baulk)	do.	3 15 0	5 15 0
Do. Odessa Crown	do.	3 15 0	5 15 0
Walnut, American	per cub. ft.	0 9	0 3 5

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

BOURNEMOUTH.—For constructing 27in. cast-iron and other relief sewers in the Ashley and Waterloo Roads, Vale and Church Roads, and Poole, Seamoor, and Alumhurst Roads, and other works in connection therewith, for the Borough of Bournemouth. Mr. F. W. Lacey, Borough Engineer and Surveyor:—

J. and T. Binns	£4,156	Grounds and Newton, 12, Triangle, Bournemouth*	£3,734
Cooke and Co.	3,937		

* Accepted.

BURY ST. EDMUNDS.—Accepted for the erection of two pairs of cottage villas. Mr. R. Mawhood, architect, 2, Market-road, Chelmsford:—

H. Frost, Westgate-road, Bury ... £1,02[illegible]

HITHER GREEN.—For the erection of schoolroom, class-rooms, and manse at Torridon-road, Hither Green, for the trustees of the Bible Christian Church. Mr. E. J. Hamilton, architect, 2, New-road, Brighton:—

Foster Bros.	£3,745 0 0	Bush and Son	£3,410 0 0
E. Jones	3,680 1 5	Hibberd Bros.	3,288 0 0
Castle and Son	3,600 0 0		

*Accepted.

LONDON.—For the erection of new premises, Finsbury circus and London-wall. Messrs. Davis and Emanuel, architects. Quantities by Mr. Walter Lawrence:—

Holloway Bros.	£243,605	Foster and Dicksee	£ 27.600
Hall, Beddall, and Co.	241,713	B. E. Nightingale	227,325
J. Carmichael	23[illegible],108	Cubitt and Co.	226,453
Trollope and Sons	236,800	Colls and Sons	225,900
Higgs & Hill, Ltd.	235,666	Patman and Fotheringham	223,840
Holland & Hannen	234,770	H. Lovatt	214,650
Lawrence and Sons	233,768		

LONDON.—For improvements at Holden-street Schools, for the London School Board. Mr. T. J. Bailey, architect:—

Holloway Bros.	£13,895	B. E. Nightingale	£12,875
Lawrance and Sons	13,552	Stimpson and Co.	12,645
Spencer, Santo, and Co., Ltd.	13,137	Edwards and Medway	12,500
Longley and Co.	13,075	Kirk and Randall	12,228
Lathey Bros.	12,889	Johnson and Co., Ltd.	11,930

* Accepted.

MELTHAM.—For laying about two miles of earthenware and cast-iron pipe sewers, for the Urban District Council. Messrs. J. B. Abbey and Son, engineers, 31A, New-street, Huddersfield:—

Waring and Sons	£4,558 11 6	R. Turner	£2,870 0 0
R. Walker	3,877 0 6	Mallinson and Sons, Lockwood, Huddersfield	2,249 0 0
H. Bentley	3,477 16 6	Matthew Hall and Son	2,007 6 5
J. E. Kaye	3,300 0 0		
Walker and Co.	3,071 2 5		
A. Graham and Sons	3,027 0 0		
B. Graham and Sons	2,919 0 0		

OXFORD.—Accepted for additions to Messrs. Elliston and Carell's premises, Magdalen-street, Oxford. Mr. Herbert Quinton, architect and surveyor, 22, George-street, Oxford. Quantities by Mr. J. A. Thompson, 50, Lincoln's Inn-fields, London, W.C.:—

Kingerlee and Sons ... £8,841 16 10

WOODSEATS (near Sheffield.—For new steam laundry: No. 1 Contract. Mr. J. P. Earl, architect, Sheffield:—

J. H. Hirst	£2,325	Margerrison and Son*	£2,300

* Accepted.

WRITTLE (Essex).—For the erection of four cottages on Oxney Green. Mr. R. Mawhood, architect, 2, Market-road, Chelmsford:—

H. Keunele	£998 0	J. Lowe*	£790 10
J. Moss	875 0		

*Accepted.

[All of Writtle.]

CONTRACTS OPEN.

COUNTY BOROUGH of BRIGHTON.

TO CONTRACTORS AND OTHERS.

Notice is hereby given that the Council of the said County Borough will receive TENDERS from such persons as may be willing to enter into a contract for the CONSTRUCTION of an UNDERGROUND CONVENIENCE, together with sundry Works connected therewith around the base of the Clock Tower, Queen's-road, Brighton.

The specifications, forms of Tender, and bills of quantities may be obtained on application at the Office of the Borough Engineer and Surveyor, Mr. FRANCIS J. C. MAY, Memb. Inst. C.E., at the Town Hall, Brighton, on payment of Three Guineas, which will be returned on receipt of a bonâ-fide Tender.

Sealed Tenders, addressed to me and endorsed "Tender for Construction of Underground Convenience," must be left at my Office, at the Town Hall, before TEN o'clock in the forenoon, on FRIDAY, JANUARY 19th, 1900.

Power is reserved to reject the lowest or any Tender.

FRANCIS J. TILLSTONE,
Town Clerk.

Town Hall, Brighton,
December, 1899.

SHEFFIELD UNION.

NURSES' HOME AND INFIRMARY LAUNDRY AT FIR VALE WORKHOUSE.

The Guardians of the Sheffield Union invite separate TENDERS from building contractors for the whole of the works required in the ERECTION of (1) a NURSES' HOME and (2) a LAUNDRY, in connection with the Workhouse Infirmary at Fir Vale, Sheffield, in accordance with plans and specifications prepared by Mr. EDWARD W. MOUNTFORD, F.R.I.B.A., Architect, 17, Buckingham-street, London.

Plans and specifications may be seen, and quantities and forms of Tender obtained, at the Union Offices, Westbar, Sheffield, on payment of a deposit of £1 1s., which will be returned on receipt of a bonâ fide Tender. Tenders must be sent to me here on or before TWELVE o'clock noon on SATURDAY, JANUARY 20th, 1900. The contract will contain the fair contract clause adopted by the Sheffield Board of Guardians, a copy of which will be supplied, and the Guardians do not bind themselves to accept the lowest or any Tender.

By order of the Board,
ALBERT EDWD. BOOKER,
Clerk to the Guardians.

Union Offices,
Westbar, Sheffield,
December, 1899.

THE BOARD of WORKS for the LEWISHAM DISTRICT.

TO BUILDERS, CONTRACTORS AND OTHERS
PUBLIC LAVATORIES AND SANITARY CONVENIENCE.

The Board is prepared to receive TENDERS for the BUILDING of PUBLIC LAVATORIES and a PUBLIC SANITARY CONVENIENCE in High-street, Lewisham.

Plans and specification of the proposed Lavatories and Convenience, form of contract, and general conditions, may be seen at these Offices (Surveyor's Department).

A copy of the bills of quantities and forms of Tender may be obtained on payment of a deposit of £1 1s., which will be returned on receipt of a bonâ-fide Tender.

The Tenders must be on the forms issued by the Board, inclosed in an envelope, sealed, and endorsed "Tender for Lavatories, &c.," and must be delivered by FOUR o'clock on TUESDAY, JANUARY 23rd, at the Offices of the Board, and placed in the box there provided for the purpose.

The Board does not bind itself to accept the lowest or any Tender.

By order,
EDW. WRIGHT
Clerk of the Board.

Lewisham Town Hall,
Catford, S.E.
December, 1899.

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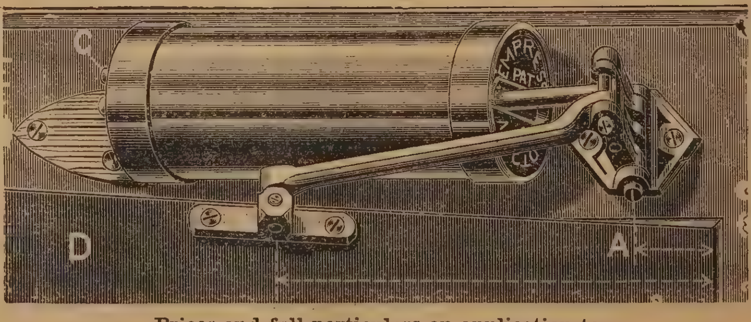

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JANUARY 3RD, 1900.

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DRAINING BUILDINGS HAVING NO OPEN SPACE.*

By Major LAMOROCK FOWLER, F.R.Met.Soc.

THE object of this paper is discussion on a problem which is frequently found in practice. In early days, drainage and sanitary requirements seem to have been about the last things the designer of a building thought about; only very recently some unpleasant facts were noted in connection with an important building recently erected in the west end of London. In this case all soil pipes were put *inside* the building, in defiance of the London County Council by-laws and the requirements of sanitary science. It is scarcely possible to conceive a case where the building is so isolated as not to have an approach to it; there are, however, numerous examples, especially of business premises, which, save the frontage to the street, are totally enclosed and have no open space, not even to vaults under the pavement. The author suggests that it is quite possible to deal with a typical case as follows:—

We must start by following modern sanitary axioms in the design, namely, no connection must be made with the sewer or cesspool into which the sewage is discharged; an intercepting chamber and a disconnecting trap must be provided, and on the house side of the trap an inlet for fresh air must be put in, which must be done without trespassing on the street; the drain must have a current of air passing throughout its entire length and out into the open through the soilpipe, which must be carried up full bore in a right line and open some 4ft. above all windows, and the soilpipe must not be inside the building; the discharge from bath, lavatory, sink, &c., must not enter the soilpipe nor the drain, save through and over a properly-trapped gully open to the air.

There must be also an inspection chamber at the head of the drain, and this must not be inside the building.

We should proceed as follows: First, carry up a shaft about 8ft. square in the rear, and taken out of the building—of course, fully open to the sky. In the base of this shaft put properly-trapped gullies to receive the bath and other wastes and the rain water, and proo vide a proper inspection chamber. Arrange te place the w.c.'s on one of the three sides of tht open shaft; fix the soilpipe in a convenienplace, and carry it up straight, full bore, open at the top, the bottom connected direct with the drain. Where several w.c.'s are connected to the soilpipe, one over the other, provide a proper anti-syphonage pipe, 2in. in diameter. Thus, by taking a shaft out of the building itself, we shall overcome the difficulty of possessing no open space, so far as the rear of our building is concerned. The w.c.'s, lavatories, bath rooms, &c., can also have free ventilation. The staircase may also be so planned as to get light from the shaft, and provision is made to allow the free passage of air from the front. It is not necessary to refer to other sanitary details, which naturally follow.

We now have to arrange matters in front. The intercepting chamber may be arranged in an air-tight closed vault, taken out of the basement, open only to the street by a hinged grating opening inwards, the opening being large enough for the passage of a workman to examine the trap and drain. The height of the vault must depend upon the level of the ground floor. Three feet above the level of pavement would allow sufficient air, and the plan may be, like the rear shaft, 8ft. square. In this vault put in an ordinary fresh air inlet on the house side of the trap, as before. Thus, we have solved the difficulty of "no open space" in front. The drain in this case perforce must pass under the house and may be of iron properly jointed; and if of iron, it is quite possible to put in an iron soilpipe of proper weight and properly jointed, and efficient junctions of the w.c. apparatus be cared for. Or the drain may be of 6in. glazed stoneware properly jointed, set in a bed of concrete and surrounded by good Portland cement concrete.

Another way of draining a house "possessing no open space" is to carry up a shaft as already described on one of the flank walls of the building and taken out of it as before. In this case we should have only one inspection chamber; this must have an intercepting trap and other details as before mentioned. Access to the shaft may be by a door in the basement. In this case the soilpipe must pass into the chamber on the house side of the trap, and the only air inlet would be for the soilpipe, as the drain would pass direct to the sewer beyond the intercepting trap. All other conditions to remain the same as already noted.

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[*] A paper read before the Annual Congress of the Sanitary Institute, held at Southampton on August 29th, 30th, and 31st.

STEEL SKELETON STRUCTURES.

By C. H. BLACKALL.

THE following is a summary of a paper on "The Legitimate Design of the Architectural Casing for Steel Skeleton Structures" by Mr. C. H. Blackall, read before the Thirty-third Convention of the American Institute of Architects, held at Pittsburgh:—In its fundamental sense the application of skeleton construction to buildings is as old as architecture itself. But, in its application to a many-storied structure, it is entirely of the present day, and almost of the present decade. Skeleton construction was mothered by necessity, and found architects unprepared. Consequently, the first attempts to carry a building through many storeys, employing the post-and-girder construction within and without, were hardly what may be termed successes. But although it is less than twenty years since the first perfected struction of this type was put before the world, it is fair to say that the methods of design for tall structures have crystallised into lines which are both logical and rational, and which have been very generally accepted. In this respect our modern tall office-buildings have shown what can fairly be termed a true development of style, and in this respect it seems fair to say they can rank with the productions of the great building periods of the past; for the typical design for an early Christian church, a Greek temple or a Gothic cathedral was hardly more fixed in its general essential characteristics, in the division of parts, the scheme of design, and the essence of the decorative treatment, than our modern commercial buildings. Rightly or wrongly, if we may fairly judge by the majority of tall buildings which have been erected of recent years, there is a distinct principle involved in architectural design as applied to a building of ten storeys and upwards. The principle is so logical and commends itself so thoroughly to one's judgment that, however much we may differ as to matters of detail or characteristics of individual style, or however much variance of opinion there might be as to the inventive qualities manifested, it is surely acknowledged that there is a right and wrong way to design a tall office building.

If I recollect rightly, the first of the skeleton-constructed buildings—namely, the Home Life Building, Chicago—was built of cast-iron columns, extending only through a single storey; it was a regular post-and-girder construction, in its essence comparable to a series of square tables placed one upon the other. The design of the exterior followed the same scheme; that is to say, each storey was by itself, with string-courses marking all the floor-levels, and a succession of similar stories piled one upon the other without a very marked proportion between the whole height and the individual parts. This was the early scheme adopted, and was the style which has been followed practically in all the buildings of a date previous to 1880. It was constructed essentially from an æsthetic standpoint that the floor-lines should be marked on the exterior by a projecting course, and while the buildings were of relatively low height—that is to say not over 100ft. high—this scheme presented certain advantages, and was an easy, if, perhaps, not altogether satisfactory, solution of the problem. Only rarely in the earlier designs was an architect bold enough to attempt to omit an occasional floor-line, and run a decorative treatment, either pilasters or plain wall-surface, through more than one storey.

About the time that the skeleton-construction was taking shape in the West a different scheme of design for the exterior of a tall building was started by the De Vinne Press Building, in New York. This building followed what might be termed the aqueduct style, and in a certain sense was a transition between the post-and-girder style where each storey is projected and the present, in that several stories were thrown together and connected by heavy arches at certain floor-levels. This aqueduct style has found a great deal of favour at the present time, and, with several modifications, has been incorporated in some of our best buildings. In the later buildings, however, it merges into a feature of the whole rather than a predominating motive. The trouble about it is that an arch is not, generally speaking, a desirable factor in any commercial building. The skeleton-construction was an outcome of a stern practical necessity and the design which best suits this construction is one which gives the maximum amount of light, and, consequently, a large arch, however imposing it is admittedly as a feature of the building, is not the most suitable form for an office-building measured by the effect on the outside.

Neither the so-called post-and-girder nor the aqueduct style has seemed to just fit satisfactorily the design of a building reaching up through twelve or more storeys. The monotony of repeating row after row the numerous floor-lines, the difficulty of getting a proper feeling of scale for the building as a whole, added to the impossibility of capping the structure with a cornice which shall have any fair proportion between the order for the storey immediately beneath it and the whole building, have led to what can be termed the columnar form of design, in which the building is treated as a whole, hardly any attention being given to the window openings as such, in which the façade is constructed in much the light of a column and given a strongly marked base, a plain shaft and a rich crowning capital, The essential principle which seems to be most in favour with all these high buildings is to treat the façade not as an aggregate of individual units, nor as a spacing or grouping, nor combination of openings, but as a whole treated as a whole and with all the decorative members proportioned to the whole height, the richness being concentrated at the bottom and the top.

It might be said, with a certain degree of truth, that all I have said applies to a high building rather than to a steel skeleton-construction, and that I am avoiding the real point at issue. As a matter-of-fact, however, it is doubtful if the present scheme of design for tall buildings would ever have been evolved except as the opportunity arose in connection with the structures which were extended so far beyond anything that was dreamed of in the old ante-elevator days. The topic of construction is a somewhat deeper one than I have thus far touched upon, and involves more the question of fitness of the individual style rather than the scheme of the design as a whole. In other words, are we to-day clothing our architectural forms, especially in our high buildings, with the right kind of ornament? Or, to embody the thought of the extreme eclectics in design, are we following the path of righteous and safe development when we adhere even indirectly to the forms we have inherited from the Classic and Renaissance period, or should we, rather, break away from the precedents of the past and attempt, as we develop a new construction, to at the same time develop a new overcoat for our architectural thoughts? This involves a consideration of what constitutes legitimate sign. Illegitimacy, as we all know, is defined unrecognised parentage. Measured by this finition, the Romantic school of to-day may ave parentage but certainly not ancestors, hereas the most truly legitimate of all archi- ctural designs is the one which has survived, its various modifications, through the wreck the Roman Empire, the untoward influences the Vandals and the Goths, and has come us strangely modified, perhaps wonderfully rtured in some details, but still intact in spirit ter all the scathiug modern episodes of the eo-Greek, Eastlake and English Gothic, to y nothing of our own vernacular. It is a pretty fe rule in this world, when you want to do thing with the least trouble and the greatest robable chance of success, to first of all find ut how other people have done it, and how ey have succeeded. Styles change, or rather e fashion of architecture is not a permanent ne. In the last twenty-five years the whole spect of the profession towards architecture, its decorative sense at least, has been completely changed, and we are now admiring the ind of work which a score of years ago was ontemptuously cast aside. Are we, then, to uppose that the present style, if I may so esignate the Classic and Renaissance revived ehicles, is also to pass as some of us trust the xtreme *fin-de-siècle* French manifestation is assing? Undoubtedly the fashion will hange, and yet it seems to me that an artistic xpression which has found favour with the reater proportion of the civilized world ever ince the year one has the best chance of long ife and continued prosperity; and if we are o take an individual style we are safer in ollowing pretty closely the lines of Classic rchitecture and Italian Renaissance, and here is more hope for a good copy than there s for a bad original.

But some of the purists tell us that it is bsurd on the face of it to borrow the motives rom the three and four storey Italian alaces and apply them directly to structures which soar up into the scores of stories, nd they would have us cast aside tradi- ion, and, by a kind of making the unishment fit the crime, cover our gaunt nd ugly skeleton of steel with some- hing which in a mysterious, unheard-of way shall be peculiarly metallic and pecu- iarly *sui generis.* Now there is no disputing n matters of taste, and I might argue from now to doomsday to prove that the Renaissance mantle is the proper design to be applied to a skeleton construction without convincing anyone who thought differently. But I entirely fail to see any lack of appropriateness in using for our own the motives from the past, and though it is very easy to charge against our present architecture that it is effete and lacking individuality, the same might be said of our language or of our methods of arithmetical notation. The changes in our architecture have kept pace pretty fairly with the changes in our speech. Both derived their roots and many of their forms from the past, and that fact in nowise militates against their use. There are certain fundamental forms which have marked the progress of architecture ever since the Beni-Hassan rock-cut temples. They are just as applicable to-day as they were centuries ago. The column long ago ceased to be purely a constructive member. The Greeks, with all their stickling for purism, did not hesitate to simulate in a facing of stone the post-and-girder construction of their roof carried out in the triglyphs and metopes. Nor did they feel any æsthetic sin in marking the ends of their walls with an engaged pilaster which was not a constructive necessity, and though it is very easy to argue that a column is always a column and is not properly used unless it actually supports something, it is also equally fair to claim that the column and pilasters have their distinct decorative functions quite aside from any structural necessity, and that the end justifies the use of these features when they merely serve their decorative purpose. If we were to simply transplant our pilasters and stick them around promiscuously on the face of a twenty-storey building, or even go to the absurd extreme of running these same pilasters through many stories and crowning them with a classically-proportioned cornice, the absurdity of such a treatment would be too manifest to require comment. The past decade has seen the evolution, we believe, of the Classic column, in modified proportions and in varying proportions, which has enabled us to use this most effective form of architectural adornment as applied in our tall buildings. In the very nature of things, we cannot construct a building which shall show its skeleton construction inside and outside except by inference. Our reason tells us that most tall buildings must be constructed with columns, concealed with masonry. We get accustomed to some architectural forms slowly. In a wooden house, for instance, we feel quite safe in ignoring all the construction, running our clapboards around the building as though such a thing as studs did not exist, and after carefully studding up the walls of a house, we will plant on the outside some imitation half-timbered work without causing a very serious wrench to the feelings of our pure-minded friends.

After all, I confess that, in matters architectural, I am a good deal of a Jesuit, and believe that the end justifies the means. The first essential requisite of an architectural structure, according to my mind, aside from matters purely of strength and stability, is that it shall be beautiful—beautiful in the fullest meaning of the word, the beauty which results from proportions which please, even if they cannot be subtly analysed, beauty which satisfies the trained mind from its coherency, and beauty which will endure through at least the life of the one who created it. I am not arguing that the tall building of to-day is an altogether desirable feature of modern civilisation. It is an outcome of necessity, and there seems to be more reason to believe that our buildings of the future will be higher rather than that they will be lower. The tall building is with us and some of our architects have been able to demonstrate beyond question that it is possible to create a tall building in a thoroughly architectural manner which shall present a thoroughly pleasing *ensemble*—the details, after all, will take care of themselves. And the question of absolute fitness of Renaissance, of the Gothic or of any other style need not trouble us half so much as the question of whether the completed building is yet architecturally beautiful.

I will recapitulate what, as a matter of individual personal feeling, I can safely affirm as my architectural creed anent these buildings. First, the most successful type of design is one which treats the front as a column with a marked base, square edged, rather small windows spaced regularly over a plain shaft, and a rich, blooming capital, proportioned to the height of the whole building. Second, the safest vehicle for expressing the ornamental details of a building is the Classic or the Italian Renaissance, because it is a style which was evolved under conditions much similar to our own and is one which affords infinite variety in mass and the utmost delicacy and beauty in detail. And, finally, no matter what we do, if our hearts be true and our buildings beautiful.

West Ham Improvements. — The Corporation of this borough seek Parliamentary powers which include :—For tramway purposes, £210,000; street works, £275,000; generating station, £210,000; workmen's dwellings, £1,675,000; and municipal lodging-houses, £130,000.

Halstead Workhouse has had its drainage system entirely remodelled. All sewers under the buildings are cased with 6in. of cement concrete and are ventilated by 6in. cast-iron shafts. The main sewer is of 9in. diameter, tapering to 6in. in places. A new concrete floor has been laid down in the washhouse, and three glazed stoneware baths (each weighing 8cwt.) and some new water-closets have been provided. The boys' new day-room has a wood-block floor and distempered walls. Messrs. Clare and Ross, of Chelmsford, were the architects for the work (which has cost £625), and Mr. George Sharpe, of Halstead, was the contracter.

THE HOUSING PROBLEM.

THAT well-known member of the House of Commons, "Mabon" (Mr. W. Abraham), has been giving his views on the housing problem through the columns of the "South Wales Daily News." The matter has now been discussed so much from one standpoint and another that it would seem some really and substantially satisfactory solution was bound to result; but the difficulty becomes greater and greater every year, though, as "Mabon" says, of all the conditions affecting the life and welfare of the community, there is not one which is of more vital inportance than the houses in which the masses of our people live.

Public opinion and the attention of Parliament have been directed to this question for the last fifty years, and the most casual inquiry shows that the health and character of the people of this country are grievously injured by the miserable conditions in which such large numbers of the people are condemned to live. The extent of the evil is recognised by, or, indeed, really known to, but very few. In large towns thousands of families have only one room for living and sleeping in, and to anyone with but a dull imagination it is dreadful to contemplate what life must be under such conditions. It is small wonder that in districts where there are many one-roomed tenements there are two deaths to every one in the country district.

This appalling waste of human life which exceeds the waste of the bloodiest war, can be prevented. Many towns have during recent years done a great deal in demolishing some of their worst areas.

In Bethnal Green, within the City of London, fifteen acres of slums have been cleared at a cost of £266,000, and some 3,200 people were affected in so doing. Dwellings were erected on ten other sites at a total cost of £300,000. Many of the latter buildings, after allowing for expenses, interest, and sinking fund, show a profit. Quite recently very large operations have been carried out by the London County Council for the provision of workmen's dwellings.

Some years ago the Glasgow Corporation obtained power to buy eighty-eight acres in the centre of the city, inhabited by over 51,000 people. The Corporation has spent nearly £2,000,000, and the scheme is becoming self-supporting and will soon yield a profit. The Corporation has also built lodging-houses, with a charge of 3½d. and 4½d. per night, and artisans' dwellings let in tenements from one room upwards. A municipal family home, with a common dining hall, recreation room and kitchen, and 160 rooms has also been erected, heated with hot water, and lighted with electricity, with a playground and a crèche. The charge for a mother and one child is 3s. 2d. per week; children's board, 1s. 10d. per week. Altogether, over £4,000,000 has been expended on private schemes and artisans' dwellings in Glasgow.

In Liverpool the Corporation built a hundred tenements, which were opened in 1891, and 271 tenements, opened in 1895. Houses have recently been erected in the Scotland Ward, the most crowded part of Liverpool, where the sanitary conditions previously were so bad that the death-rate was 40 per 1,000—considerably more than double the normal rate. The rent is 2s. 6d. per week for two rooms and a scullery, with the use of the yard, &c.

Great as these and kindred evils are, much may be done even under existing laws to remedy them. Medical officers of health and urban and rural district councils have very large powers under the Public Health Acts. By these Acts "any house or part of a house so overcrowded as to be dangerous or injurious to the health of the inmate" and "any premises in such a state as to be injurious or dangerous to health" are declared to be a nuisance, and power is given to the local authority to deal with such nuisance and to order repairs and alterations.

If the owner does not comply with the requirements of the authority, proceedings may be taken before the magistrates, and the house may be closed without compensation. In some localities very good work has been done under these Acts, but in many, perhaps in most, districts, the local authorities and their officers have done little, or nothing.

But even larger powers are given by the Housing of the Working Classes Act of 1890, under which an Urban or Rural District Council may clear away an entire district if it is proved to be so unhealthy that demolition is the only remedy.

A Council may also compulsorily buy land and build houses. One of the most valuable features of this Act is the power which is given to the inhabitants of the district to put the law in motion if the Council neglects to do so.

Can damages be recovered by tenants of insanitary premises? is one of the most important questions in this connection at present. For after all the most effective mode of doing away with the insanitary conditions of the habitations of the poorer classes would be the knowledge of the fact that the owners of such premises could be made responsible by law for allowing such conditions to exist. To put such owners to the test occasionally, as it is evident can be done, would tend materially to reduce the dangers from the insanitary conditions of workmen's houses.

A case in point. The Housing of the Working Classes Act of 1890 enacts that "In any contract made after the 14th day of August, 1885, for letting for habitation by persons of the working classes a house, or part of a house, there shall be implied that the condition of the house is at the commencement of the holding in all respects reasonably fit for habitation." This provision applies to the letting of a house or part of a house at an annual rent not exceeding the following amounts: As to England, if the premises are situated in the Metropolis, £20; at Liverpool, £13; at Manchester or Birmingham, £10; elsewhere, £8. In Scotland or Ireland, £4. On August 27th, 1898, the wife of a painter, whose average wage was £2 a week, acting upon her husband's instructions, took, at a weekly rent of 6s., the basement of a house in Paddington. Between December, 1898, and the expiration of the tenancy the children of the painter suffered from various illnesses. The house was condemned as insanitary by the sanitary inspector, and the painter sued the owner of the house for damages. The County Court judge said that upon the evidence there could be no doubt that the drains of the house were out of order, and that the premises had not been "reasonably fit for human habitation" for some time previous to January, 1899, and the question was whether the right inference to be drawn from the evidence was that they were out of order and unfit for habitation at the commencement of the holding on August 27th, 1898. The judge held that such was the right inference, and that the plaintiff was entitled to recover from the defendant the damages, which he fixed at £19. From this amount of £19 the judge allowed defendant to deduct 12s. for rent due to him, and gave judgment in favour of plaintiff for £18 8s. and costs, leave to appeal being allowed.

At Manchester the Sanitary Committee have decided to recommend to the Council the purchase of a large plot of ground in the district of Higher Blackley, within three miles of the Royal Exchange. The estate contains an area of about 237 acres, and the price at which the Committee can become the owners is £150 per acre, inclusive of all mineral rights. As the chairman, Mr. Alderman McDougall, pointed out at a special meeting of the committee the other day, the total cost would be something like £36,000. Nothing is decided as to what course shall be adopted in utilising the ground, or what shall be the character of the houses to be put up, beyond, of course, the broad fact that they will be adapted to the needs of the working classes.

The late city engineer of Liverpool, Mr. Percy Boulnois, built in 1896 a number of three-storey tenements in Gildart's Gardens. The idea was to let them for 1s. per room per week; the rents have actually worked out at 2s. 6d. and 2s. 9d. a week for two rooms and a scullery, and 3s. 6d. for three rooms and a scullery. It has been asked why, if this can be done and made to pay a return of 4 per cent. in Liverpool, it cannot be done also in London. As the "Economic Journal" points out, there is first of all a great difference in the value of the land; in Gildart's Gardens it is about 12s. a yard, but in London it would be nearly double that amount. The cost of building is also different in the two cities. For instance, a foreman's weekly wages in London are about £3 10s., in Liverpool £1 less. In Liverpool 1,000 bricks are bought and delivered for 1s. 6d., in London for 2s. 2d. Cartage is about 6d. a load more, and the wages of bricklayers, joiners and labourers, are all higher in London than in the North. In some cases also the London Building Act requires a greater expenditure than do the regulations in force in Liverpool. The rooms in London would have to be 8½ft. high, instead of 8ft. as in Gildart's Gardens; the party-walls would have to be carried through and above the roof instead of stopping underneath. The rooms in Mr. Boulnois's cottages are smaller than those built according to the regulations of the London County Council. There are also important differences in practice, while in Liverpool there is close co-operation between the different departments of the public service. Mr. Boulnois was able to use old tramway rails instead of steel joists for his floors, and these were transferred from the Tramway Department at £2 10s. per ton, £1 10s. being the price for a ton of scrap iron, and £1 the charge for cutting the rails to the required length. The clinker from the corporation dust destructor—a waste product of a waste product—was utilised for making cast concrete steps. Materials were supplied according to the standing contracts of the Health Department. These and other savings have not been within the reach of the London County Council. In London over 55 per cent. of the gross rental is absorbed in expenses of management, repairs, and the like, while in Liverpool 40 per cent. has been allowed.

Masters and Men.

The Strike of Joiners at Halifax still continues.

Painters' Wages.—The Trade Union Painters in the Walkden District of South-east Lancashire have applied for an advance of ½d. per hour on their present wage of 8d., and for certain alterations in the working rules.

The Abstract of Failures in 1899 shows that in the building and timber trades 645 bankruptcies have occurred as against 535 in 1899, 425 deeds of arrangement as against 406, and 539 bills of sale in 1899 as against 572 in 1898.

International Trades Unions Federation.—It is stated that with the advent of the New Year special efforts are to be put forth with a view to establishing an International Federation of Trades Unions. Communicating with the English Amalgamated Society of Carpenters and Joiners, through Mr. Macdonald, secretary of the London Trades Council, Mr. J. Jensen, chairman of the Associated Trades Unions of Denmark, thinks that at the next International Congress some scheme should be agreed upon for an international understanding between the workers of all countries, in order that they may be able to withstand any international coalition of the employing classes.

The Amalgamated Society of Carpenters and Joiners has opened a new branch in Aberdeen. The total membership of the Society is now 61,725, and the number of branches 771 (at the end of 1860, the year in which it was started, the total membership was only 618, and the number of branches 20). The total income for one year is £142,766, and at the present time the cash balance amounts to £172,712. During 1898 the unemployed benefits paid amounted to £13,462; accident benefits £4,500; superannuation benefits, £14,663; and funeral benefits, £5,788. The branches of the Society are not confined to the British Isles, but extend to the United States of America, Canada, Australia, New Zealand, Cape Colony, and the Transvaal. In the latter place, unfortunately, the branches are closed on account of the war.

Strikes and Lock-outs in 1898 are reported on by Mr. J. Burnett, Chief Labour Correspondent of the Board of Trade (Labour Department) in a Blue-book which has just been issued. It is prefaced by a note by Mr. H. Llewellyn Smith, the Commissioner for Labour, who points out that the 711 disputes of 1898 were almost entirely dominated by the influence of the great dispute in the South Wales coal trade. The total aggregate duration of disputes during the year, amounted to over 15,000,000 days. If the coal trade and engineers' disputes be omitted, the year was singularly free from important disturbances, the aggregate duration of all the other disputes during the year being only about 2,500,000 working days. During the first eleven months of 1899 the number of new disputes reported has been only 680, and the aggregate duration of disputes has been only 2,375,000 days, the lowest totals yet recorded for a similar period. As regards causes, out of a total of 200,769 persons engaged in disputes from all causes, 176,392, or 88 per cent. of the total, were involved in disputes on account of differences as to wages, as compared with 44·1 per cent. in 1897 and 64·9 in 1896.

Proposed Reduction of Wages in Aberdeen.—A meeting of the district branches of the Aberdeen Associated Carpenters and Joiners was held in the Trades Hall last Thursday for the purpose of considering the proposals formulated by the masters with reference to the alterations in the existing rules. The proposals are to the effect that there should be a reduction in the matter of overtime of from time and a half to time and a quarter per hour; that the present rate of wages should be reduced from 8½d. to 8d. per hour; that the excess wages paid to Aberdeen members working in the country should be reduced from 5s. to 4s. per week; and that the regulation allowing notices of changes on the rules to take place only once a year should be changed so that notice of alteration could be given at three months' notice. The meeting, after full discussion, came to the conclusion that the present state of trade did not warrant the alterations which the masters proposed. They considered that whilst the building trade was at present somewhat slack, the prospects did not indicate a continuance of that state of things. They expressed their surprise that the masters should propose to change the rule affecting notices of alterations, seeing that the resolution as now in operation was orginally drafted by them. The meeting decided unanimously to oppose in every detail the masters' demands. The Amalgamated Carpenters and Joiners will meet on an early date to discuss the question.

Dispute Between the Bricklayers and Plasterers.—In our issue for November 22nd we stated that trouble was likely to arise between the Operative Bricklayers' Society and the Plasterers' Society upon the question as to who should have the laying of tiles to hearths. This has now arisen in the case of a small job at Wandsworth—the Nurses' Home. Both societies claimed the work, and if either trade had got it the other would undoubtedly have come out on strike. Alderman Henry Taylor, the representative of the Bricklayers' Society on the London County Council, was deputed to meet Mr. Gregory, a member of the Master Builders' Association, and Mr. Hennessey, of the Plasterers' Society. Mr. Taylor states that, bearing in mind the fact that his own society had just about that time voted by a majority of five to one in favour of the formation of a Conciliation Board to deal with the demarkation of work between trades, Mr. Gregory, Mr. Hennessey and himself agreed that it would be a great mistake to have a dispute over such a small matter as this, which involved a few weeks' work for two men, and they therefore signed a temporary agreement relating only to this particular piece of work, by which the small hearths should be laid by the plasterers and the large ones by the bricklayers, so that neither side gained any advantage. A vote is now being taken by the Bricklayers' Society upon Mr. Taylor's action, and is expected by both him and Mr. Batchelor, the secretary of the Society, to go against him and discontinue at once the payment of the salary which has enabled him to render his own trade and the cause of labour generally such splendid service on the L.C.C. The trouble really has arisen as a result of Mr. Gregory, in justice to Mr. Taylor, writing a letter explaining the position. Mr. Taylor did not give away a principle or a right or decide against his own trade, and he refused to acknowledge that the plasterers had the right to this work. We consider that Mr. Taylor has acted quite rightly, and we only wish that other trades' unions had representatives of such marked ability to do what was best for his trade. His moderation has always caused him to be held in esteem by the masters and the sensible workmen; he did not act as a mere agitator holding always to the opinions of the majority of the members of his society, whether right or wrong, which too often occurs, resulting in the non-recognition of these agitators by the masters as a go-between. We regret the two unions did not come to an arrangement such as we suggested before: that a qualified man of either trade should be allowed to lay tiles to hearths with equal wages paid to either man—these qualified men we prefer to call "tile-fixers," as they require a special knowledge for the work.

Builders' Notes.

The Edinburgh and Leith Master Builders' Association recently held its annual dinner, when the president, Mr James Millar, occupied the chair.

Tenders for New Technical College at Wigan.—The nine original tenders for the erection of the proposed new college buildings in Library Street, Wigan, varied from about £20,000 to £36,000, exclusive of contracts already entered into for terra cotta to the amount of about £5,000 which the successful competitor will include. The selection has not yet been made.

A New Artificial Stone, says Consul Atwell, of Roubaix, three times as strong as freestone, and resembling Cobestang granite in properties, has been tried at Malmes Arsenal. It is unaffected by cold, it absorbs only 6 to 7 per cent. of water, and requires a pressure of 88lbs. on the square centimetre (0.155in.) to crush it. The stone is made at Uccles, near Brussels, and is inexpensive.

Wrexham Improvements.—At the last meeting of the Wrexham Town Council it was decided to purchase a steam fire engine for £380, and the borough surveyor (Mr. J. W. M. Smith) was instructed to prepare a specification, in accordance with his plans (already approved), for the proposed public baths; the work to be partly done by contract and partly by the corporation employees. Application is to be made to the Public Works Loan Commissioners for the advance of £20,000 for electric lighting, £1,800 for public baths, and £2,100 for a refuse destructor.

Leeds Corporation and Fair Contracts.—At the last meeting of the Leeds City Council objection was taken by several members to the letting of a contract to Messrs. J. Schofield, Sons and Co. for the construction of seven electric transformer chambers, at a cost of £2,298, on the ground that the contractor did not pay the standard rate of wages to certain of his men. It was said Mr. Schofield claimed that the men who excavated were not builders' labourers, and therefore not entitled to the higher rate of wages. Since then the Lighting Committee have resolved to again recommend the Council to accept Messrs. Schofield's tender.

Surveying and Sanitary Notes.

Morecambe Sewage.—The first contract for the new sewerage scheme for Morecambe has been let to a Leeds firm for £66,500. The second contract is under consideration.

Street Improvements at Mansfield.—It is proposed to borrow £19,400 for street improvements at Mansfield, and £1,415 for water supply. A Local Government Board inquiry has been held.

Brighouse Sewage Scheme.—Rapid progress has now been made with the Brighouse sewage scheme—the expenditure up to date is £98,766 7s. 8d. Mr. Fowler, the engineer, reports that the tanks at the outfall works are now complete.

The Most Dangerous Crossing in London.—At a recent inquest on the body of a man who had been knocked down by a cab at the corner of the Embankment and New Bridge Street, a juror said the spot was the most dangerous crossing in London. This spot, which has already been condemned as such by three coroners' juries, is sometimes called "Slaughter Corner."

Road Material at 84s. a Ton.—The people of Dayton, Green County, Wis., have, it would appear, been building their roads not wisely but too well. For years they have been using a whitish substance which cropped out of a hill near the village mill. It made excellent roads and had a good appearance, and that was all the villagers thought about it. Now a visitor has disturbed the equanimity of the Dayton folk by the discovery that the white substance is the best quality of silica, and that it is worth from 62s. to 84s. a ton for the manufacture of pottery. The bed from which this silica has been taken is 10ft. thick and is supposed to run back into the hills for fully a mile.

Sanitary Inspectors' Examinations.—At the recent examination for sanitary inspectors under the Public Health (London) Act, 1891, the following candidates passed: Miss M. le F. Boileau and Miss G. E. M. Church, Sanitary Institute; Mr. W. J. Coleman and Mr. A. E. Didier-Garnham, King's College; Miss Julia Hancock, B.A., Miss R. B. W. Holmes, and Miss E. C. Honey, National Health Society; Mr. S. H. Kemp, King's College; Miss M. K. le Lean, Sanitary Institute; Miss D. B. Meeson, Miss F. M. Nicholas, Miss M. W. Richardson, Miss C. F. Stephens, Miss A. E. Turner, and Miss A. M. S. Tweeddale, National Health Society; and Mr. T. D. Young, King's College.

"Water Closets and Their Connections" were dealt with by Mr. Isaac Low in a recent lecture before the Glasgow and West of Scotland Technical College Architectural Craftsmen's Society. In his opening remarks he showed how the subject was of more or less importance to architects and craftsmen. He deprecated the idea that any hole or corner was good enough for a water closet; it should have three of its walls to the outside, although the cost was, of course, always prohibitive to a great extent to the proper sanitation of any building. He traced the evolution of the water closet from the earliest times. It was in evidence considerably earlier than most would imagine. The earliest ideas mostly took the form of a marble basin with the ordinary draw-valve. The idea was good, only the marble being very absorbent rendered such an article unsatisfactory. The evolution of the pan closet, which was similar in idea to that just mentioned, was next described by the lecturer, who afterwards dealt with the hopper closet, which was much used in Edinburgh, and was really the prototype of the present "wash-down" closet, this latter being first brought out in Glasgow. Traps were commented on, and with regard to internal and exposed plumber work the opinion was expressed that the former was quite proper if the tradesman did his work correctly. An interesting discussion followed.

Engineering Notes.

Mr. John Smith, of Keighley, machine and crane maker, died last week at the age of sixty years.

Electric Traction for the London Tramways is proposed to be adopted. The Council are promoting a Bill which entails an expenditure of three millions of money; but not more than £250,000 would be spent before September 30th, 1901.

American Competition.—The Glasgow Corporation have accepted the offer of the National Conduit Cable Company, New York, for electric feeders for the city tramways. The American price was £151,000, or £10,000 under the lowest British offer.

Street Lighting with Acetylene.—An experiment in supplying acetylene gas like coal gas is going on in Tata-Tovaros, Hungary, a town of 12,000 inhabitants. Five miles of piping light 158 street lamps and 250 burners in houses. The generating plant only requires the services of two men; the installation cost about £10,000.

Dublin Electric Lighting.—The Dublin Corporation have adopted a large scheme for extending the electric lighting of the city. It is proposed to establish new plant at the power house, capable of supplying 100,000 lamps of eight-candle power, and 412 new arc lights are to be provided in the streets. The estimated expenditure is £250,000. The works are to be completed in two years.

Proposed Electric Lighting Extensions in Aberdeen.—To meet the increased demand for electrical energy in Aberdeen, it is contemplated to extend the plant and buildings. The engineer, Mr. Bell, reports favourably of a site in Dee Village for a new station. The ground would be sufficient for the installation of at least 10,000 h.p. of engines and boilers. In the meantime, to meet the needs of the winter of 1900, he recommends that an additional 700 h.p. engine and dynamo should be installed in the existing engine room at the Cotton Street works.

An Ingenious Lighting Scheme.—One of the most interesting long-distance transmission plants that has yet been constructed is that for the lighting of the city of Los Angelos, and running a railway, from power generated at the San Gabriel Waterfall, in California. So many novel combinations were forced upon the designing and constructing engineers at every step, says "Engineering," that the whole installation presents a constant series of surprises. The San Gabriel River, although filled from bank to bank, 400ft. apart, in the rainy season, is marked during the long summer months of cloudless sky by dry bleached gravel, with a narrow stream meandering near the centre. A few inches below the surface of this so-called "dry" river, moisture is found, and by digging a few feet ample water appears. The intake of the water to the tunnels for transmission to the turbines presents a novel feature, for after passing the strainerbars and headgates the water makes a perpendicular drop of 20ft., whence it continues horizontally through a tunnel, the first of a series of thirty-eight tunnels in the waterway. This drop of 20ft. is provided to divert into the tunnel, during the summer season, the underflow that filters through the sand and gravel beneath the river bed. To secure this underflow permanently a submerged dam is being built across the bed of the river immediately below the intake, which will effectually catch the entire stream. The water is conveyed a distance of six miles. The average gradient of the waterway is 5ft. per mile. At the power station four double sets of waterwheels are used. The electrical equipment includes four Westinghouse generators, 300 kilowatts each, two-phase, 500 to 550 volts, with a normal speed of 450 revolutions per minute. The line from Azusa to Los Angelos is twenty-three miles in length, and six conductors for the electricity are provided, the results being most satisfactory.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
		BUILDING—		
Jan.	5	Linthwaite, Huddersfield—Houses	Industrial Co-operative Society, Ltd.	J. Berry, 9, Queen-street, Huddersfield.
,,	5	Whitley, Northumberland—Council Offices, Fire Brigade House and Stores.	Urban District Council	J. P. Spencer, 13, Grainger-st. West, Newcastle-on-Tyne.
,,	6	Swindon—Hospital Buildings	District Hospital Board	Halliday and Rodger, 14, High-street, Cardiff.
,,	6	Birmingham—Alterations to Coachman's House	Guardians	W. H. Ward, Paradise-street, Birmingham.
,,	8	Eastbourne—Bandstand	Pleasure Grounds Committee	R. M. Gloyne, Borough Engineer, Town Hall.
,,	8	Oswestry—Market Extension	Town Council	E. W. Lacey, Borough Engineer, Guildhall, Oswestry.
,,	8	Blaentylery, Mon.—School	Aberystruth School Board	R. L. Roberts, Victoria-chambers, Abercarn.
,,	8	Penrhiwceiber, Wales—Additions	....	Morgan and Elford, 1, Jeffrey-street, Mountain Ash.
,,	8	Oldmeldrum, Scotland—Cottages	....	Anderson, Ardconnon Farm, Oldmeldrum.
,,	8	Southmead, near Bristol—Walls	Barton Regis Guardians	A. P. I. Cotterell, 7, Baldwin-street, Bristol.
,,	9	Liversedge, Yorks.—Schools	School Board	A. E. Rhodes, Cemetery-road, Heckmondwike.
,,	9	Llangollen—Alterations to Court House	....	County Surveyor, Denbigh.
,,	9	Hove, Sussex—Alterations	School Board	Clayton and Black, 152, North-street, Brighton.
,,	10	Preston—Post-office	H.M. Office of Works	Office of Works, Queen Anne's-gate, Westminster.
,,	10	Heamoor, Cornwall—Additions to School	Madron School Board	O. Caldwell, Architect, Penzance.
,,	10	London, S.E.—Disinfecting House	Guardians	Guardians' Office, Brook-street, Kennington-road, S.E.
,,	11	Huddersfield—Church	....	The School, College-street, Crosland Moor.
,,	11	Preston—Post and Inland Revenue Offices	Commissioners	Alan Paull, 6, Quality-court, Chancery-lane, W.C.
,,	13	Kilkeel, Ireland—Masonic Hall	....	R. B. Wray, Kilmorey Arms Hotel, Kilkeel.
,,	13	Bawtry, Yorks.—Church Restoration	....	Boreham and Morton, 24, John-street, Sunderland.
,,	13	Guildford—Schools	School Board	A. J. Sturgess, 25, High-street, Guildford
,,	13	Huddersfield—Homes	Guardians	J. W. Cocking, Cloth Hall-street, Huddersfield.
,,	13	Llanrhaiadr-yn-Mochnant, Wales—Hall	Parish Council	D. Evans, Clerk, Oswestry.
,,	15	Grimsby—Workhouse Extension	Guardians	H. C. Scaping, Court Chambers, Great Grimsby.
,,	15	Drumshemuck (Ireland)—Farm Outoffices	....	R. Scott, 15, Willoughby-place, Enniskillen.
,,	15	Tunbridge Wells—Enlargement	Corporation	W. C. Cripps, Town Hall, Tunbridge Wells.
,,	15	Chiswick—Generating Station	Aberystwyth and Chiswick Electricity Supply Corporation Limited	Kincaid, Walker, and Manville, 29, Great George-street, Westminster.
,,	15	Oxford—School	School Board	F. P. Morrell, 1, St. Giles, Oxford.
,,	15	London, W.—Warehouse	S. Goff and Co.	S. Goff and Co., 83, Long-acre, W.
,,	16	Birkenhead—Electricity Generating Station	County Borough	C. Brownridge, Engineer, Town Hall.
,,	16	Chadderton near Oldham—Police Station	Standing Joint Committee	H. Littler, Architect, County Offices, Preston.
,,	17	London, N.W.—Foundations, &c.	Willesden Guardians	A. Saxton Snell, 22, Southampton-buildings, Chancery-lane, London, W.C.
,,	19	Brighton—Conveniences	Corporation	F. J. C. May, Town Hall, Brighton.
,,	20	Sheffield—Nurses' Home	Guardians	Union Offices, Westbar, Sheffield.
,,	23	Lewisham—Public Lavatories, &c.	Board of Works	Surveyor, Lewisham Town Hall, Catford, S.E.
,,	26	St. Pancras—Baths and Washhouses	Vestry	T. W. Aldwinckle, 1, Victoria-street, S.W.
,,	29	Sunderland—School	School Board	Office of Board, 15, John-street, Sunderland.
,,	29	Stratford-on-Avon—Wall	Town Council	Roden Dixon, Municipal Offices, Stratford-on-Avon.
		ENGINEERING—		
Jan.	5	Bedford—Electric Lighting Plant	....	T. S. Porter, Town Clerk, Town Hall, Bedford.
,,	5	Beverley—Rain-water Storage	Guardians	Master, Beverley Workhouse.
,,	6	Glasgow—Electric Traction	Corporation Tramways	J. Young, 88, Renfield-street.
,,	6	Calne, Wilts.—Waterworks	Town Council	W. H. Stanley, Market-house-chambers, Trowbridge.
,,	6	Roscommon, Ireland—Reservoir, &c.	District Council	C. Mulvany, M.I.C.E., Roscommon.
,,	8	Abingdon—Reservoir	Rural District Council	G. Winship, Borough Buildings, Abingdon.
,,	8	Abergavenny—Waterworks	Rural District Council	J. Gill, Surveyor, Merthyr-road, Abergavenny.
,,	8	Clacton-on-Sea—Gasholder	Urban District Council	S. Francis, Engineer, Town Hall, Clacton-on-Sea.
,,	8	Tiverton—Laundry Appliances	Joint Hospital Board	J. Siddalls, Architect, Tiverton.
,,	9	Barnes—Electric Lighting Plant	Urban District Council	Surveyor, Council Office, High-street, Mortlake.
,,	9	Glasgow—Dash Wheels	Corporation	P. Fyfe, 23, Montrose-street, Glasgow.
,,	9	London, N.W.—Condensing Plant	Vestry of St. Pancras	Electricity Dept. Offices, 57, Pratt-st., Camden Town, N.W.
,,	10	Manchester—Ventilation, &c.	Corporation	G. Plant, Town Hall, Manchester.
,,	11	Horsham, Sussex—Heating, &c.	School Board	W. Buck, North-street, Horsham.
,,	12	Ruabon, Wales—Pipelaying	....	Dennis and Son, Ruabon.
,,	13	London, S.E.—Dust Destructor	Bermondsey Vestry	Town Hall, Spa-road, Bermondsey.
,,	15	Carmarthen—Bridge	Rural District Council	Rowland Browne, 7, Hall-street, Carmarthen.
,,	15	Inverness—Harbour Works	....	J. Fraser, Civil Engineer, Inverness.
,,	15	Tunbridge Wells—Condensing Plant	Corporation	Electrical Engineer's Office, Tunbridge Wells.
,,	16	Newcastle-on-Tyne—Generator	New Tramways Committee	C. Hopkinson, 29, Princess-street, Manchester.
,,	16	Gomersal, Yorks.—Sewers	Urban District Council	J. Waugh, C.E., Engineer, Sunbridge-chambers, Bradford.
,,	18	Handcross, Sussex—Water Tower	Cuckfield Rural District Council	J. Mansergh, 5, Victoria-street, Westminster.
,,	19	Pluck's Gutter, near Ramsgate—Bridge	....	W. A. Valon, Hardres-street, Ramsgate.
,,	20	Ilford—Electric Lighting Plant	Urban District Council	J. W. Benton, Council Offices, Ilford.
,,	20	Oban—Extension of Railway Quay	Callander and Oban Railway Co.	T. M. Barr, Engineer, Northern Division, Caledonian Railway, Perth.
,,	22	Glasgow—Machinery	Corporation	D. Home-Morton, 95, Bath-street, Glasgow.
,,	23	Barking—Electric Lighting Plant	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
,,	25	Hastings—Boilers	Guardians	Jeffrey and Skiller, 5, Havelock-road, Hastings.
,,	26	Valetta, Malta—Waterway in Tunnel at Sea-level	....	Superintendent of Public Works, Valetta.
Mar.	1	Melbourne—Electric Lighting Plant	Corporation	Agent-General for Victoria, 15, Victoria-street, Westminster, London, S.W.
		IRON AND STEEL—		
Jan.	6	Roscommon, Ireland—Water Mains	District Council	C. Mulvaney, Engineer, Roscommon.
,,	6	Calne, Wilts.—Pipes	Town Council	W. H. Stanley, Market House-chambers, Trowbridge.
,,	8	Clacton-on-Sea—Steel Gasholder	Urban District Council	S. Francis, Engineer, Town Hall, Clacton.
,,	9	Skipton—Oxide of Iron	Urban District Council	R. Wilson, Clerk to the Council, Skipton.
,,	10	Ryton-on-Tyne—Iron Hospital	Urban District Council	J. P. Dalton, Surveyor, Ryton.
		PAINTING AND PLUMBING—		
Jan.	6	Cardiff—Painting at Workhouse	Guardians	A. J. Harris, Clerk, Queen's-chambers, Cardiff.
		ROADS AND CARTAGE—		
Jan.	6	Halifax—Paving	Highways Committees	E. R. S. Escott, Engineer, Town Hall, Halifax.
,,	8	Croydon—Granite	Guardians	H. List, Union Offices, Mayday-road, Thornton Heath.
,,	8	Barry, Glamorgan—Improvement Works	Urban District Council	J. C. Pardoe, Surveyor, Council Offices, Holton-rd., Barry.
,,	8	Ilford—Paving	Urban District Council	H. Shaw, Surveyor, 7, Cranbrook-road, Ilford.
,,	10	Dartford—Stone	Commissioners of Sewers	J. C. Hayward, Sessions House, Dartford, Kent.
,,	19	Monkton and Stourmouth, Ramsgate—Road	....	L. W. Hogbin, Surveyor, Birchington.
		SANITARY—		
Jan.	5	Bolton—Scavenging	Corporation	R. G. Hinnell, Town Hall, Bolton.
,,	6	Cheltenham—Sewer	Corporation	Surveyor, Municipal Offices, Cheltenham.
,,	8	Waterford—Sewerage Works	....	Waterford District Asylum Office.
,,	15	Paddington—Sewers	Vestry	Surveyor, Vestry Hall, Harrow-road, W.
,,	18	Kirkby-in-Ashfield—Sewerage Works	Urban District Council	H. Silcock, 14, Westgate, Mansfield.
,,	18	Valetta, Malta—Pipes	....	Crown Agent for Colonies, Downing-street, London.
,,	18	Isle of Thanet—Sewerage Works	Rural District Council	A. Latham, Municipal-buildings, Margate.
,,	22	Uxbridge—Sewers	Rural District Council	J. Anstie, 10, Marchwood-crescent, Ealing.

COMPETITIONS OPEN.

DATE DESIGNS TO E SENT IN.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
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Feb.	12	Barnsley, Yorks.—Church and Vicarage	£52 10s., £31 10s., £21	Lancaster and Sons, Church-street, Lancaster.
,,	28	Doncaster—Isolation Hospital	£25, £15	F. E. Nicholson, Solicitor, Union Offices, Doncaster.
Mar.	12	Belfast—Assembly Hall	£100, £50, £25...	W. D. Eakin, 12, May-street, Belfast.
,,	31	Walsall—Municipal Buildings	£100 awarded to each selected competr.	J. R. Cooper, Town Clerk, Borough Offices.

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Tuesday, January 16th
Tuesday, January 30th
Tuesday, February 13th
Tuesday, February 20th
Tuesday, February 27th
Tuesday, March 6th
Tuesday, March 13th
Tuesday, March 20th
Tuesday, March 27th
Tuesday, April 3rd
Tuesday, April 10th
Tuesday, April 24th
Tuesday, May 1st
Tuesday, May 8th
Tuesday, May 15th
Tuesday, May 22nd
Tuesday, May 29th
Tuesday, June 12th
Tuesday, June 19th
Thursday, June 21th
Tuesday, June 26th
Thursday, June 28th
Tuesday, July 3rd
Thursday, July 5th
Tuesday, July 10th
Thursday, July 12th
Tuesday, July 17th
Thursday, July 19th
Tuesday, July 24th
Thursday, July 26th
Tuesday, July 31st
Tuesday, August 14th
Tuesday, October 9th
Tuesday, October 23rd
Tuesday, October 30th
Tuesday, November 13th
Tuesday, November 20th
Tuesday, December 4th

By arrangement, Auctions can also be held on other days in town or country. Messrs. Debenham, Tewson, Farmer, and Bridgewater undertake Sales and Valuations for Probate and other purposes of Furniture, Pictures, Farming Stock, Timber, &c.

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Other appointments for intermediate Sales will also be arranged.

Thursday, January 11th
Thursday, January 25th
Thursday, February 8th
Thursday, February 22nd
Thursday, March 8th
Thursday, March 22nd
Thursday, April 5th
Thursday, April 26th
Thursday, May 10th
Thursday, May 24th
Thursday, June 7th
Thursday, June 21st
Thursday, June 28th
Thursday, July 5th
Thursday, July 12th
Thursday, July 19th
Thursday, July 26th
Thursday, August 2nd
Thursday, August 9th
Thursday, September 27th
Thursday, October 11th
Thursday, October 25th
Thursday, November 8th
Thursday, November 22nd
Thursday, December 6th
Thursday, December 13th

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

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BRITISH AND DUTCH ARCHITECTURE IN SOUTH AFRICA: Written and Illustrated by Frank L. Emanuel. Part One.

JAPANESE DOMESTIC INTERIORS: By Ralph Adams Cram. Illustrated.

EMANUEL HOSPITAL: Written by Bulkeley Cresswell. Illustrated by Arthur Stratton.

THE PARIS EXHIBITION AND SOME OF ITS BUILDINGS: Written by A. Anderson.

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WITH SURVEYING AND SANITARY SUPPLEMENTS.

January 10, 1900.
No. CCLVII.
Effingham House,
Arundel Street,
Strand, W.C.

An Architectural Causerie.

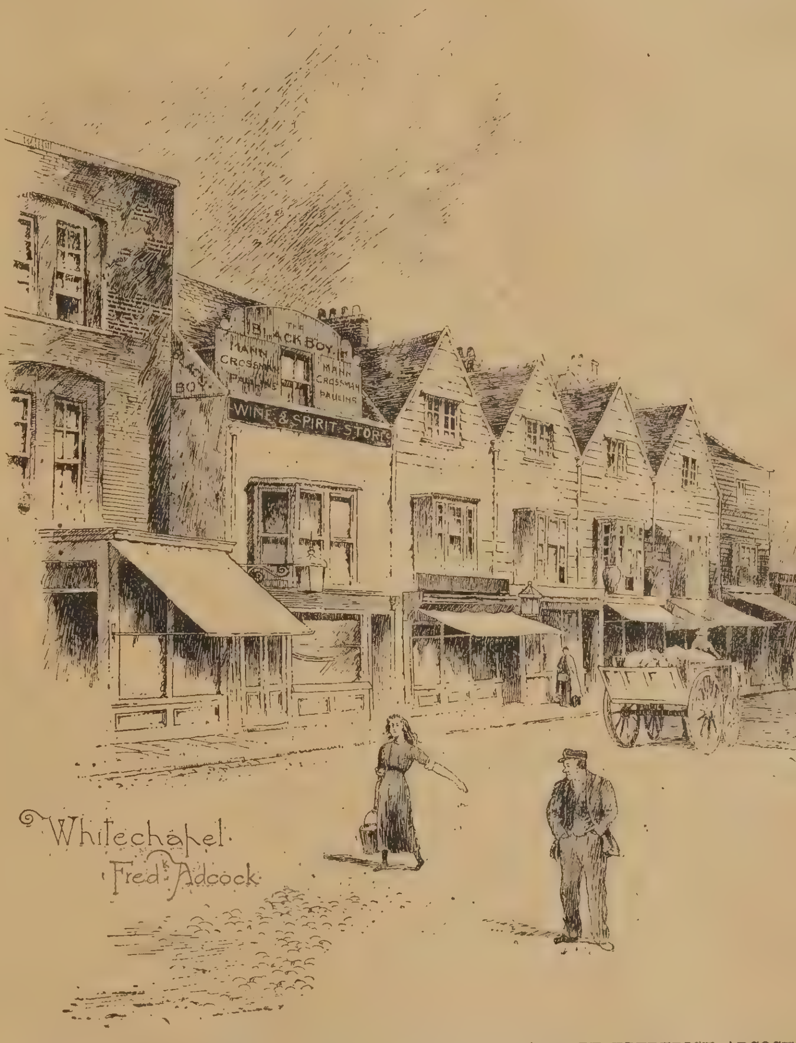
Alas, Poor "Ghosts!" There are few circumstances which mark the practice of architecture during the past quarter of a century more strongly than the decay of the once respectable class of which I claim to have been a not insignificant member—a decay so steady and persistent as to lead, I fear, to complete extinction. An elderly ghost, whose long and honourable career of usefulness has closed, may be excused if, from his well-earned retirement, he turns his thoughts fondly backwards to the doings of the happy band to which he once belonged. In the days of his prosperity he was, and felt himself to be, a power in the land. The open repudiation and the private adulation of which he was the object brought with it an air of mystery which was flattering to his vanity. He enjoyed the excitement of a conspirator, whilst he at the same time ran no risk. His remuneration was, perhaps, partly contingent upon success, but, at the worst, it was in excess of the normal rate, and he was always indemnified against loss. His patrons were civil and considerate—often liberal—partly, perhaps, because the disclosure of his identity would have been inconvenient. Amongst the select society of the brethren he enjoyed the stimulus and reward of fame.

The existence of the ghost, and facilities for enlisting his ability, encouraged the growth of a kind of architect who had all the requisites for success except a knowledge of architecture. Educated, glib, well connected, and possessed of "means," he had the keen scent which tracked out a promising job, and the skill to win over the committee or other movers in the project. He took the necessary pains to ascertain the requirements, and discover the sort of thing which would be most likely to go down with the projectors. These preliminaries being settled, the rest of the business devolved upon the ghost. He it was who, in dingy chambers through long days and nights, worked up the roughest of ideas. Under his rapid and skilful hand the formless thing took shape. All styles were alike to him, and as a draughtsman he was, of course, *facile princeps.* He was, as an artist, really interested in the design, in which he secretly felt a paternal pride, and the perspectives upon which, as he knew, the final triumph mainly depended, blazed out in all the bravery of the entire resources of the colour box. Seldom or never did the suspicion of the existence of the ghost get abroad. Idle rumours could be denied or explained away. The ghost, too, "felt his part," and acted up to it. Moreover, the report and estimate were in the architect's *own handwriting!* What cathedrals, mansions, schools, adorn the land which owe their being to Ghostly Fathers! But the leading virtue of a ghost who respected himself and his profession was silence. So loyal and discreet have this honourable body shown themselves, that many buildings of acknowledged excellence are *known* to be the work of ghosts, but of what particular ghost no one has been able to discover. The ghost was so impressed with the responsibilities of his unique position, that there were things he never revealed even to his brother spirits. He "chortled" the more, and descended to the shades with his secret intact.

But all is changed, and I, a lonely superannuated member of that once flourishing body, wander to and fro companionless. A change for the worse has come over our patron. It is now thought that he should be in very deed what he is in name. Priggish societies, with long names, have taken him in hand, and now teach him his business. Life for him is earnest. He dresses like an ordinary professional, and actually gives himself the trouble to qualify for practice.

The beautiful superstition which hung around the art of drawing in perspective—and which the various learned treatises (with a sly humour) contrived to mystify—has long since been rudely dispelled. Each one now makes his own designs, and, as to perspectives (or the scratchy things which do duty for our beautiful pictures), he finds no more difficulty in them than in copying the five orders from Chambers or Gibbs. As a Cook's tourist, or on wheels, he courses all over Europe and brings back sketches which thirty years ago would have won him reputation as a prodigy. He is quick to hit the passing taste, and ready with both pen and pencil. What a ghost he would have made! But by his inconsiderate efficiency he has left no room for that obsolete and discredited artist. Alas, poor ghost! It is said that even the painter's ghost has gone out, and that our modern Raphaels and Reynoldses "do" their own hands and draperies; and, although it is whispered that suspicious figures still haunt our sculptor's studios, I have never met a brother who admitted that he was connected with that branch of art.

The poor remnant that survives is not sufficiently numerous to form a club where we might meet, and—with due reserve and the sanction of appropriate rights—recount the brave doings of our prime. Disclosure by other means is, of course, out of the question. Each could "a tale unfold," but the "eternal blazon" must not be, for no ghost would so far forget himself and so bring discredit upon an honourable, but, alas! fast dwindling body—if the term may be allowed. For the same reason this lament must remain unsigned, for it must be obvious to all readers that it is of the essence of a real ghost to be OCCULT.



OLD HOUSES IN WHITECHAPEL ROAD, LONDON. DRAWN BY FREDERICK ADCOCK.

Old Houses at Whitechapel. There are still to be found in various parts of the East End many exceedingly curious and interesting remains of Old London. Not the least attractive of these are the ancient wooden houses that stand a little way down on the north side of the Whitechapel Road. Their chief charm, perhaps, lies in their antiquity, and certainly something of their artistic effect is owing to the squalor and general ugliness of their surroundings; at the same time, as will be seen by the illustration on this page (which is from a drawing by Mr. Frederick Adcock), they have a quaint picturesqueness that is peculiarly their own.

The Abuse of Plate Glass. In this age of silent revolutions changes are effected in the appearance of towns with a sort of stealthy swiftness unknown in previous ages. When plate glass was introduced it was looked upon as a small but perceptible modern improvement, suitable to a country where light is not too plentiful; but within the last year or two its adoption has been so rapid that it is actually bringing about a vast change in the appearance of London streets. It has been rendered possible by the great development of steel and iron construction, and in every direction we see the lowest storey, popularly called the "ground floor," being removed bodily, and an immense sheet of plate glass substituted for it. Where once was masonry there is now a light transparent material; above it rises floor upon floor of ordinary heavy bricks or stone, and as the system extends we find entire streets of houses resting upon air; at a little distance the effect is most singular. Nor is it confined to the ground floor: every here and there the next storey is being treated in similar fashion, though sometimes the change is limited a little by confining the glass within a large round arch. The removal of masonry, however, is almost as great, and the building, in the hitherto accepted sense of the word, disappears. How far will it be carried? The question is interesting, and will shortly assume great importance. Already we see Jacobean gables and a red-brick storey or two rising over an unreal-looking structure, apparently of glass, though actually held together by a strong framework of steel. Will walls gradually disappear, and finally even the gables, London being transformed into a city of glass and iron? About this change there is one singular and inexplicable feature. The object of introducing vast sheets of glass was to admit more light. But most of the shops thus treated are very dark, for the front is completely occupied and the light blocked by a mass of goods, scores of gloves, dozens of shirts, and, most nauseating to the eye, in the restaurants, a mass of eatables, enough to take away any man's appetite. The interior of refreshment rooms, bars, "lounges," and similar places feels the effect of the age of glass in a want of snugness and a sense of cold magnificence; the glass being often associated with other hard, glossy, icy materials; one loses the friendly comfort of surrounding walls, giving privacy and excluding the sense of cold. Even on a smaller scale than this, where plate glass has been used for large windows well placed in solid and handsome masonry, the effect is that of a succession of large holes. There are few modern buildings of a nobler appearance than the National Provincial Bank in Bishopsgate Street, few indeed to equal it; but the lofty windows require something to break up their vast expanse of black nothingness given by gigantic sheets of glass; light in our climate is important, no doubt, but there is no need to exaggerate its importance, and the present use of plate glass is either an abuse or it portends a revolution, and one without much justification, in the whole art and craft of architecture. It is satisfactory to note an occasional protest against this tendency and several large hotels and some other buildings in the best quarter of London have deliberately adopted smaller panes, some with lattice or other leading. But whether they will be able to stem the tide remains to be seen. J. C. P.

On Reflection.

Co-operative Building. A well-known American architect, Mr. J. Pickering Putnam, has been advocating a scheme for erecting dwellings by co-operative effort on the part of skilled workmen. Mr. Putnam's plan has some novel features, but before considering the details of any individual plan the preliminary question—whether co-operation in any form is a thing to be encouraged—has first to be decided. We cannot expect that the contractor will regard experiments of this sort with enthusiasm; the general and successful adoption of co-operative principles would mean the elimination of himself and his class, though he may feel reassured to know that such a contingency is a very remote one—at any rate in this country, where the building trade has hitherto been but little influenced by the co-operative movement. From the point of view, however, of the architect, the workman, and the public, there is much to be said in favour of these schemes. Men engaged in the production of buildings which will be their own property would have an incentive to industry altogether lacking under the existing system; mutual helpfulness, instead of antagonism and suspicion between members of different trades, would be the rule, and the architect would find pleasant relations with the workmen facilitated by the existence of a common aim—the expeditious and satisfactory completion of the job on hand—while the public would gain by an improvement in the character of the buildings. If the restoration in the twentieth century of the noble craftsmanship of the mediæval builders is a thing at all possible, it will only be, we think, by a wide development of the co-operative idea. One thing, however, needs to be remembered: co-operation, to be successful, demands workmen of the highest type. The average workmen of to-day would prove, we fear, a failure in co-operative building, unless, indeed, he were inspired by ideals and principles very different from those which seem to commend themselves to many of our trade unions.

Craftsmen for Australia. It is a great day in the life of a nation when it discerns that there are other things to live for than to eat, sleep, and fight; here is the starting point of civilisation. But it is a long time before the old passions are subdued (they are never eliminated altogether) and the higher branches of industry and of art are able to exercise any potent sway over the mind of the community. As a glance at history will show, this influence fluctuates greatly—is sometimes strong, sometimes weak, at one time inventive and full of grace, at another dull and imitative; but the effects of good work can never be entirely lost, just as we feel to this day the ennobling elements in the writings of the old Greek poets, or in the paintings of the Italian masters. To come to present times, we may take Australia, and a letter from a leading architect in Sydney (published in the R.I.B.A. journal) as an example. When the British first colonised in this vast country they necessarily built themselves houses, and then began to practise agriculture and farming, and to dig in the earth. With the discovery of gold came a great influx of wealth-seekers and adventurers, but after the first shock had quieted down and routine took the place of excited impulse, some of the gentler arts began to be felt, and are really just beginning to have force. In the letter referred to above it is said: "We are at a loss out here for good art workmen of all kinds. There are plenty of third-rate men, but there is only one highly-skilled worker in metal. There is a good opening in all branches for workers in wood, iron, stone and metal; also for stained glass workers, modellers, and designers in plastic materials, decorative painters, and men skilled in the working of marble and mosaic. Young men with a small capital, but with artistic capacity, would be the most suitable. If without capital, they could readily get employment here at good rates of pay. The one essential is that they shall be good men. Of course, good men can always find employment 'at home.' But as there may be many with incipient lung or chest complaints, bronchitis or affections of the throat, this climate could not fail to be of great benefit to them. For general information as to the colony, our Agent-General, Sir Julian Salomons, will, I am sure, if applied to, furnish all that is required." This states the case very plainly, and those of our readers who have a desire to respond to the invitation are given all the information that is necessary to test themselves by, which really amounts to their being "good men." Unhappily, young fellows often emigrate to one or other of our colonies in a very haphazard fashion; they seem to think that they will soon be able to secure an appointment when they arrive, but often find out to their cost that this is not so easy. Before deciding on a matter of this kind, which may have life-long results, it ought always to be a primary consideration to ascertain first the need for, and then the fitness of, new additions to trades and professions, for it is quite possible that these may be as full in the colonies as they are here.

Noisy Streets. The question of repressing street noises is one that has now been discussed for some considerable time, though apparently with little effect, but it has lately received renewed attention by a circular issued under the auspices of the Society for the Suppression of Street Nuisances, a society whose existence is perhaps known to but very few. All noise is comparative; that is, what to one man seems loud and harsh may have little effect on another who has become accustomed to such intense sounds. By some London is considered to be very noisy, but many New Yorkers find it quiet in comparison with their own city. The three sources of noise whose abolition is desired are, street musicians, newsvendors, and railway whistles. A great diversity of opinion exists in regard to this matter, which is no doubt the reason why there has been so much talk and so little action. Take, for instance, street musicians. Now, while the alien band or the vocal starveling is certainly obnoxious (that is, speaking generally), many piano organs are pleasing to hear. The raucous newsvendor is indeed a nuisance, and it were well that his calling were prohibited and that other employment found for him. Railway whistles are an abomination, and, to replace them, a system of wireless telegraphy between engine drivers, guards, and other officials is about to be tried in Italy; this may possible prove one means of mitigating the nuisance. It has often been stated that harsh, discordant sounds, whether we have become so accustomed to them that they are hardly heard or not, do wear and injure the nerves, and, consequently, the brain. This argument has no doubt often been carried too far, but there is much truth in it. A great advance has been made in the matter of the suppression of street noises by the substitution of wood and asphalt for the old cobbles, and by the employment of rubber-tyred vehicles, but there is still a great deal more to do, and, as their aim is to begin to ameliorate our surroundings by actual work, the Society for the Suppression of Street Nuisances certainly deserves support from all those who know what it is to live in a town or city where one disagreeable din is a prominent feature in the day's life.

ELTHAM PALACE.

BY C. G. HARPER.

THE sale of the Crown lease of the old Court Lodge at Eltham, and of the ruins of the ancient Royal Palace, which stands within the extensive grounds, gives a renewed interest to an historic relic which, less than ten miles from London and situated within easy reach of such populous suburbs as those of Greenwich, Lee, and Blackheath, is yet little known either to the lay public or the architectural student. Eltham yet keeps its old village character, and the beautiful, elm-shaded road that leads from it to the railway station is still old-world, despite the handsome villas recently erected on the Crown lands here. The Crown, indeed, has a tight grip over this neighbourhood, and one of the many minor and generally unheard-of titles of the Prince of Wales is "Baron Eltham." Even back in the dim records of Saxon times the manor belonged to the Crown. After the Conquest it was given by William to his half-brother, Odo, Bishop of Bayeux, but was confiscated by William Redbeard and conferred upon the Magnavilles, Earls of Essex. From that time onward a kaleidoscopic succession of owners held the lands here, but they always reverted to the Crown again, and so they remained from the time when Anthony Beke, Bishop of Durham, made them over in 1310 to Edward the Third until the troublous days of Charles the First, when the Parliamentary Commissioners under Cromwell seized the Palace and parks and sold them to the highest bidders. Even then the see-saw of history had not done with Eltham, for Charles the Second resumed the property upon the occasion of what an old chronicler calls his "glorious and never-to-be-forgotten Restoracion." But that was the ultimate change of ownership, and with the Crown it has ever since remained.

ENTRANCE TO SUBTERRANEAN PASSAGE FROM THE MOAT. DRAWN BY C. G. HARPER.

History is uncertain about the extent and style of the buildings that existed here before those whose ruins we see to-day. That they were extensive and of a palatial character may be judged from the records that relate how the Prince-Bishop of Durham spent large sums upon the works at the beginning of the fourteenth century; and from the fact that when the bishop died in 1310 the King made "Eltham Palace" a favourite residence. His son, "John of Eltham," was born here five years later, and Edward's former prisoner, King John of France, was entertained here with great splendour. From either of these last two facts the popular name of "King John's Palace" given to the ruins may derive. Certain, however, it is that, whatever the popular voice may do, history does not couple the name of our King John with the place.

BRIDGE ACROSS THE MOAT. DRAWN BY C. G. HARPER.

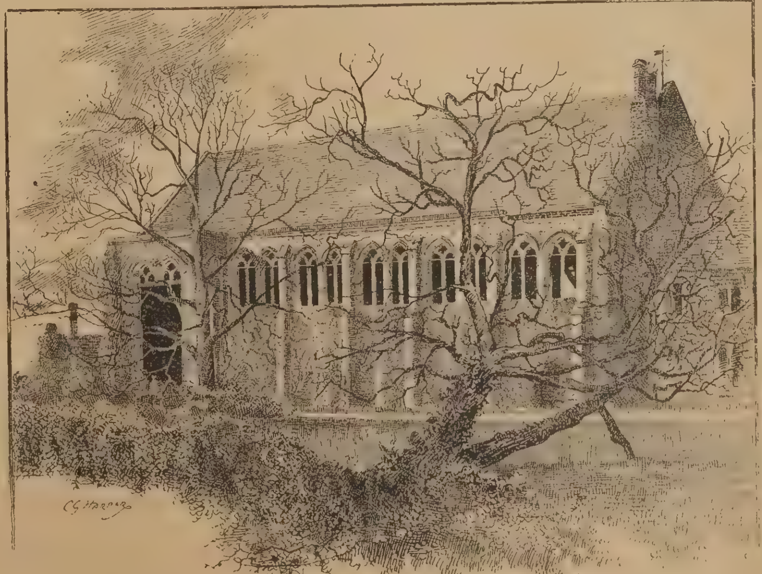
Edward the Third, then, was the first to make this a royal residence. Many State functions were held here in his reign, and Parliament assembled twice under the long vanished roofs, which also sheltered Richard the Second, and the Fourth, Fifth, and Sixth Henrys. With Edward the Fourth the palace was rebuilt, and the existing ruins are chiefly of his period. His badge, the "rose en soleil," may yet be seen carved on the spandrels of the doorway to the Court Lodge.

After having been the scene of great festivities in the reign of Edward the Fourth, when the Christmas of 1482 was kept up here on a scale of unparalleled magnificence, two thousand persons being entertained every day at the royal expense, Eltham began to lose favour. It is true that the Princess Bridget was born here, and that Henry the Seventh frequently made the Palace his home, but Henry the Eighth had no great liking for it. According to an old writer, "This house, by reason of the nearness to Greenwich, hath not been so greatly esteemed, the rather also that the pleasures of the emparked groundes here may be in manner as well enjoyed, the Court lying at Greenwich, as if it were at this house itselfe." So from this time forth the Palace seems to have fallen upon evil days. James the First was the last sovereign to reside at it.

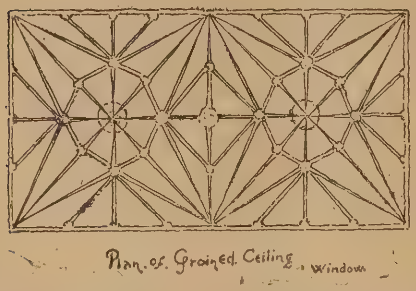
A very potent reason for the old Palace being so little known is that its ruins stand in private grounds. Placed in a retiring position at the end of a lane, which branches off from the high road and leads nowhere else, it is not to be supposed that this old-world spot could readily be discovered by the chance wayfarer, nor are many prepared to ask permission to explore the ruins; although it may here be hinted that the presentation of a visiting card generally wins a courteous permit. Following the course of the winding lane, enclosed on one side by an old wall of red brick, beautiful in its mellow tints and vivid and velvety lichens, one comes to a cluster of old cottages, whose queer boarded fronts, low doorways, and quaint latticed windows make almost irresistible demands upon the sketch book. Passing these, however, for the yet finer feast in store, the roadway leads up to and over an ancient Gothic stone bridge of three arches time-worn and delightfully patched with red brick, old itself in degree. This spans the moat, still partly filled with water. Here the first glimpse is obtained of the venerable banqueting hall, which is the finest remaining feature of the palace, and with a sight of this the pilgrim who may feel inclined to visit the spot will know that no disappointment awaits him.

Previous to the extensive rebuilding under the direction of Edward the Fourth, Eltham was a castellated residence, but when this remodelling took place its defensive character was changed for one of a more refined and almost purely domestic sort. Men, of whatever their station, wanted homes to dwell in rather than fortresses. Even such personages as kings, hedged around with snares, treacheries, and dangers above the common lot, gave hostages to fortune in this manner and were content no longer to live in crypt-like cells, unlit save by arrow-slits or exiguous Norman peep-holes, or First Pointed lancets. Hence, among other signs and portents, this substantial stone bridge in place of a drawbridge; and hence, above all other things, the spacious, graceful, and well-lighted banqueting hall. This noble structure measures 100ft. in length,

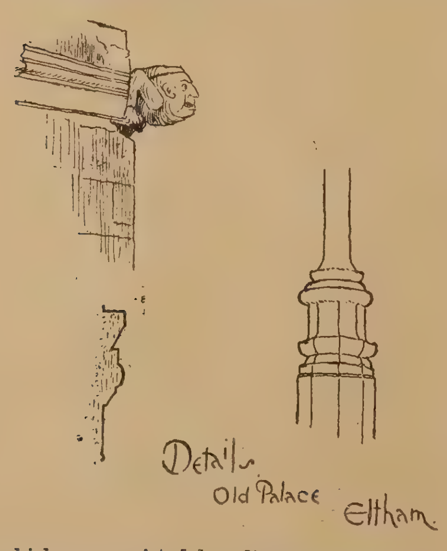
ELTHAM HOUSE. DRAWN BY C. G. HARPER.


THE BANQUETING HALL. DRAWN BY C. G. HARPER.

56ft. in breadth, and is 60ft. in height. It is technically a neat and masterly example of the builder's art, quite apart from the strictly architectural point of view. The walls consist of a core of red-brick, faced internally with plaster, and externally with fine ashlar, jointed with the greatest nicety. This grand structure is lit from either side by a row of coupled windows, each couple separated by a buttress in two stages and of moderate projection, terminating just below the cornice. Each window is divided by a mullion, and is cinquefoil headed, the cusps being greatly decayed. Some of these windows on the north side are bricked up. At the western end of the Hall, on the north and south sides respectively, are two shallow projections containing windows of great beauty, reaching almost from floor to cornice, originally with a great central mullion and an embattled transom midway. These projecting bays still keep their exquisitely grained ceilings. The cornice is decorated with many gargoyles of an engaging hideousness and in excellent preservation.



The interior is now shorn of all its tapestries and other decorations, but the much-mutilated fragments of the once handsome carved oak minstrels' gallery at the eastern end remains to testify to the sumptuous nature of the former appointments. Enough survives to show that this woodwork is contemporary with the hall, the supporting shafts exhibiting the detail seen in the graceful shafts of the two bays just referred to. It is by the merest chance that the building is not a roofless wreck. At the beginning of the century it did duty as a barn, until the growing appreciation of Gothic drew attention to it, and to its beautiful and massive open hammer-beam chestnut roof, and brought a new danger into existence, a proposal having been made to remove the roof to Windsor Castle. A louvre which once existed has disappeared, the disposition of the woodwork alone proving its existence at one time.



Built on to the east of the Hall is the Court Lodge of Henry the Eighth's time. This is a picturesque, timbered three-gabled elevation retaining its original pierced barge-boards. From beneath the well-kept lawn an underground passage, suggesting dark secrets and romantic incidents of bygone days, winds its dim way to the moat and opens in the wall just above the former level of the water.

PRACTICAL NOTES ON HERALDRY.

By GUY CADOGAN ROTHERY.

I.—INTRODUCTORY.

HERALDRY, properly and judiciously treated, is decidedly effective in architectural and all other forms of decoration. But in spite of the once important part that this science played in social economy, it is curious to see how constantly its meaning is misunderstood and its laws violated by modern artists and decorators. It is therefore worth while to briefly sketch out an historical and practical guide for designers and those who work with brush or chisel, or even the needle. Heraldry is often the most appropriate and the most pleasing of ornamentation; but if it is used, it should not be misrepresented, as we only too often see is the case, both in artistic and merely commercial work.

The origin of heraldry has long been a matter of controversy. The adoption of tribal, national and personal lodges certainly began in prehistoric times; at all events we find traces of such a custom in the rude remains of forgotten races. Hence some writers trace the origin of heraldry very far back indeed. As a matter of fact, however, heraldry only became an art when laws were laid down for its guidance and when symbols adopted were recognised as hereditary. It seems certain that this did not come about until the eleventh or twelfth centuries, when nobles fought in armour and each led his particular body of retainers into the field. The Emperor Frederick Barbarossa is believed by some to be the real father of the art. At first nobles were allowed to do much as they listed in the matter of adopting coat-armour. In England, although two heralds, Norroy and Surroy, were nominated by Edward I., and Clarencieux by Henry IV. in 1411, it was not until the reign of Henry V. that proclamation was made forbidding anyone to assume armorial bearings without permission from the King or his heralds. Heralds' visitations, to enforce this order, were instituted. During these visitations the heralds went round from town to town, summoning all knights, esquires and gentlemen to appear and register their arms, and marriages, births and other events. These visitations took place at irregular periods and lasted for about eighteen months to two years. Henry V. was a great patron of heraldry: he instituted the office of Garter King of Arms, and, as his pursuivant, Blue Mantle. It was also during his reign that coat-armour became regularly hereditary and descended from father to son, the eldest alone wearing the shield as his father did before him; the younger ones had to make some difference, such as adding a border, or using the marks of cadency. The oldest coats-of-arms are generally very plain and have but few charges besides the Ordinaries, for it was the common practice of the younger branches of a family to add other charges, alter the outline and colours of charges, and assume borders of different descriptions to their paternal arms, instead of using the marks of cadency.

Sir James Lawrence, speaking of heraldry and nobility, in his "Nobility of the British Gentry," thus explains the original use of, and the usual way of obtaining, armorial bearings: "Any individual who distinguished himself may be said to ennoble himself. A prince judging an individual worthy of notice gave him patent letters of nobility. In these letters were emblazoned the arms that were to distinguish his shield. By this shield he was to be known or *nobilis*. A plebian had no blazonry on his shield because he was *ignobilis*, or unworthy of notice. Hence arms are the criterion of nobility. Whoever has a shield of arms is a nobleman. In every country of Europe, without exception, a grant of arms, or letters patent of nobility, is conferred on all the descendants." Thus it will be seen that the essential part of heraldry was the hereditary character of coat-armour. It may be as well to explain that the appellation of *coat* of arms originated from the practice of embroidering the family insignia on the surcoats, a garment worn over the armour or shirt of mail; these surcoats in later times were used only by heralds, by whom they are still worn when on official duties, and by pages and menials of princely or noble houses.

From the arms of the head of the State to arms of concession there are altogether ten degrees: First, arms of dominion, or national armorial bearings borne by sovereigns. Secondly, we have arms of pretension, or armorial bearings, adopted by sovereigns of kingdoms or provinces over which they are actually reigning. (If a man marries an heiress he is entitled to wear her arms in an escutcheon of pretence, placed over his own, but this properly belongs to the eighth degree.) Thirdly, arms of community, such as the arms of bishops' sees, of towns, universities, colleges and corporate bodies. Fourthly, arms of patronage, which are arms of community worn by the occupants of various offices of responsibility and dignity. Fifthly, arms of succession; arms borne by the inheritors of fifes, manors, either by will or donation. Sixthly, arms of assumption. Seventhly, paternal arms; the arms descending from father to son. Eighthly, arms of alliance; arms quartered by the descendants of an heiress in order to show their descent. Ninthly, arms of adoptions, borne by strangers in blood in accordance with the wishes laid down by will or other legal mode of donation, or arms borne by an adopted child, of the original bearer; but before adoption express permission must be obtained from the sovereign. And tenthly, arms of concession; armorial bearings, parts of armorial bearings, or special charges given by a sovereign to a subject.

There are three principal divisions of heraldry—the field, the tinctures and the charges.

The field is the ground of the shield or banner, and for the better descriptions of armorial bearings the shield has been divided into the upper portion, known as the chief point; the middle, known as the fesse; and the lower called the base; and is further divided into dexter and sinister sides.

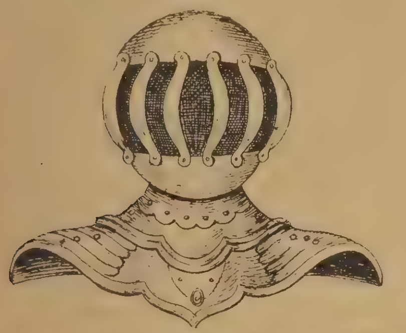
In describing a shield, the tincture of the field should be first mentioned. A shield may be party-coloured. For instance, a shield divided down the middle by a perpendicular line, the left side green and the right red, would be described thus: Party per pale gule and vert. The term *proper*, when used in reference to the tincture of a charge, shows that it is of its natural colour. Thus, a green tree with a brown trunk is a "tree proper." Roses cannot be emblazoned *proper*, as they may be either red or white; but a "rose proper, gule," or a "rose proper, argent," is a perfectly correct blazoning, for it shows that the roses are the botanical flower and not the heraldic one. When an escutcheon is described as having three charges of the same kind, it is always to be understood that they are borne two above and one below, unless specially mentioned as being borne *in pale*, *in fesse*, or *in bend*.

In heraldry there are two metals and five ordinary colours. In engravings of coats-of-arms each colour is represented by differently-arranged lines. Some authorities assign this invention to Colombière, others to Silvestro di Pietrasanta, about the seventeenth century.

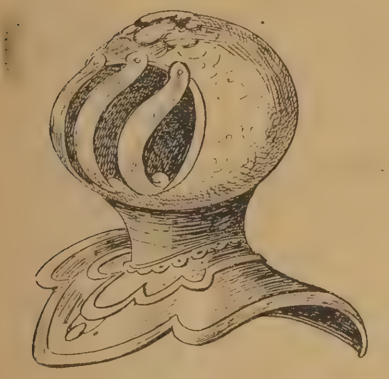
Or, gold, is represented by dots; *argent*, silver, by a plain surface; *gules*, red, by perpendicular lines; *azure*, blue, by horizontal lines; *sable*, black, by perpendicular and horizontal lines crossing each other; *vert*, green, by lines from dexter chief to sinister base; and *purpure*, purple, by lines from sinister chief to dexter base. Besides these five ordinary tinctures, there are two more mentioned by heralds, although they are but seldom used. They are *sanguine*, sometimes called *murrey*, a deep red to represent the colour of blood, which is represented in engravings by lines from dexter chief to sinister base, crossed by lines from sinister chief to dexter base; and *tenny*, or *orange*, by lines from sinister chief to dexter base crossed by horizontal lines.

Gules is considered the most honourable tincture, no doubt because it represented the blood lost on the battlefield in the service of one's king. Ermine ranks first among the furs on account of its having been originally restricted to the crowned heads and their nobles and afterwards extended to judges and other high law officials. Count de Gobelins states that the heraldic colours derive their names from the Arabic. Other writers argue that *gules* comes from the French *gueule*, the mouth of a wild beast, which is generally red.

The furs are *ermine*, white with black spots, and its three modifications—*ermines*, black with silver spots; *erminetes*, white with black spots and a red hair on each side of the spots; *erminois*, gold with black spots; and *pean*, black with gold spots. *Vair* is represented by blue and white shields or glasses in horizontal rows, the bases of the white resting on the bases of the blue. This fur has also one modification, which is termed *counter vair*, in which the glasses of one colour are placed base to base. *Vair* is always emblazoned argent and azure, and *counter vair* or and azure. *Potent* is represented by crutch-shaped charges; it is emblazoned argent and azure, the base of one colour being placed on the base of one of metal; and its modification *potent-counter-potent*, sometimes termed *vairy-cuppy*, which is of the same tinctures as *potent* but the crutched-shaped charges of one colour, have their bases placed against the bases of one of the same colour.



ROYAL HELMET.



PEER'S HELMET.

During the seventeenth century the heralds in England, in order to give more dignity, as they thought, to the science, used the names of jewels instead of the metals and tinctures when emblazoning the shields of peers and peeresses. The only use of this system appears to have been to make heraldry all the more puzzling and difficult of comprehension to the non-initiated. Silver was replaced by pearls or crystal, gold by topazes, gules by rubies, azures by sapphires, sable by diamonds, vert by emeralds, and purpure by amethysts. Furs, of course, retained their usual names. Princely insignia were emblazoned with the names of planets and heavenly bodies. The Sun represented gold; the Moon, silver; Mars, gule; Jupiter, azure; Saturn, sable; Venus, green; Mercury, purpure; or by their symbols, ☉, ☽, ♂, ♃, ♄, ♀, ☿. Such was one of the ways that heralds adopted to try and give increased importance to the science, while they only helped to entangle it in senseless, and, therefore, worse than useless additions.

Heralds also invented a long list of abatements (marks of disgrace), such as the *gores* and *gussets*; Guillim affirming these two to be objects used by "Semsters," and, therefore, appropriate to denote cowardice, which seems to be a rather hard charge against the poor sempstresses. A man who recanted his challenge to combat was assigned a "*delftennée.*" The only abatement that was extensively used and acknowledged by heralds of all countries was the *scarpe* or *baton*, the abatement assigned in cases of bastardy, and one which has popularly the misleading term of bastard-bar.

The general prevalence of lions and fleur-de-lis in armorial bearings of early date was caused by augmentations made by kings to their favourites and those who had distinguished themselves in battle or in council. It is only in the later periods that heraldic charges assumed those strange and fantastic shapes and forms, such as the lion with two heads or tails, the eagle with two heads, which has been assumed by different empires, although it originated with the Germans, to denote their eastern and western possessions.

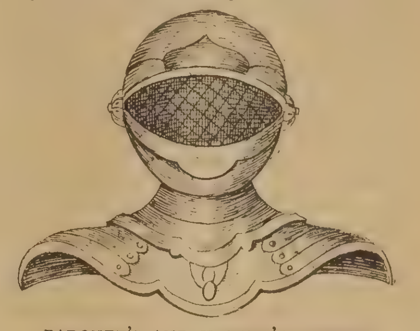
Favourite charges of primitive heraldry were the escallop shells, which later on came to denote pilgrims, travellers who had been on long sea voyages, weapons of war, pilgrims' staves, &c. The chevron, the bend and a ladder have had special virtues assigned them, as denoting the founder of a family. The Passion and lambeaux crosses, stars and lilies denoted ecclesiastical arms, or the arms of those who had fulfilled vows. Swords, offensive and defensive weapons and armour, and flames, denoted warriors. The *water bowgets* were charges frequently assumed in early heraldry. They were bags made out of the skins of animals, in which water was carried by soldiers and pilgrims when about to undertake long marches. Animals of every kind and in every position, and fabulous animals, were pressed into use by the heralds. The vegetable world was also ransacked and the sun, moon and stars shone on many shields.

One or two peculiarities with regard to the shield ought to be mentioned. First, in describing a shield and its charges, the dexter and sinister sides are so called from the position of the shield when worn against the chest of the bearer and not with regard to the spectator. The only woman entitled to wear her arms on an ordinarily-shaped shield is the reigning Queen, or the consort of a King; the proper shield for maidens and widows is a diamond. Knight bannerets wear their arms emblazoned on a square shield. Illegitimate heraldry, that is to say, merchants' marks and rebuses, ought to be borne on round shields, technically termed targets.

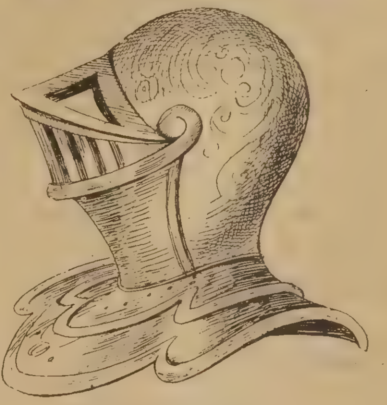
The exterior ornamentations of a shield are termed *mantling* (sometimes *lambrequins*); they are represented as a scarf, the *cointise*, used by the old military commanders round their waists and over the shoulder, or as the *robe of estate*. When it represents the cointise or scarf it is always borne in rags, so as to represent the wear it has sustained on the field of battle. The robe of estate of a sovereign is of gold, lined with ermine; a peer's is crimson lined with ermine; and knights and commoners have their's in their livery colours or crimson lined with white. Maidens and widows surround their escutcheons with *lacs d'amour*, or cords with running knots, and married women have *cordeliers*. The other exterior ornaments are the scroll, on which the motto is placed, and the wreath, two pieces of silk twisted together representing the colours of the livery, on which the crest is placed. In describing or emblazoning a wreath, the first twist, beginning from the dexter, ought to be of metal and the last of colour.

Coronets, caps of maintenance and helmets are also exterior surroundings of the shield. In English heraldry there are very strict rules with regard to the helmet; the helmet of kings and royal princes is placed full face, is of gold lined with crimson, and has six bars to the vizor; the helmets of peers are in profile, are made of steel ornamented with five golden bars to the vizor; baronets and knights of every grade have a full-faced steel helmet with an open vizor without bars to it; esquires and gentlemen of coat-armour have a helmet in steel borne in profile, with a closed visor without bars. A helmet is often surmounted by a crown, coronet, or crest. Some helmets open in front in two parts, the upper portion being termed the visor, for seeing through, and the lower part the beaver, through which the knight could drink.

The cap of maintenance, or dignity, is a cap of crimson velvet lined and turned up at the edges with ermine. It has two long points behind. Originally it was worn by those who had a right to enrol and maintain an army. It is now worn only by dukes and a few families who wear it as an ancient privilege, and these place their crests on the cap instead of the wreath.

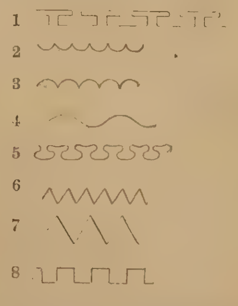


BARONET'S AND KNIGHT'S HELMET.



ESQUIRE'S HELMET.

Supporters consist of animals, real or fabulous; men in armour, clothed or naked; and sometimes of inanimate objects, placed on each side of the shield. A well-known example of inanimate supporters are the pillars of Hercules, the supporters of the arms of Spain. Sometimes escutcheons are placed on the breast of an eagle displayed. Menestrier says that supporters are derived from a custom that prevailed of having the armorial shield carried by two pages, before their master, on all grand occasions. These supporters were at first, it has been argued, only freaks of the painter's and engraver's imagination, and had no real heraldic significance. There is circumstantial evidence, however, that these exterior ornaments had important significance, as denoting territorial dominion, success in warfare, family alliances, etc. But the use of supporters was at last restricted, in England, to the sovereign, princes of the blood royal, peers, peeresses, knights of the Garter and knights of the Bath and a very few ancient families who use supporters as a special privilege; Sir Walter Scott was one of the few who were granted supporters by Lyon King-of-Arms after the general restriction of supporters to personages of high rank.



LINES OF DEMARCATION.

1. Potenté. 3. Inverted. 5. Nebrilé. 7. Dancetté.
2. Engrail. 4. Wavy. 6. Indented. 8. Embattled.

A PRIVATE LIBRARY.

By E. S. HARTLEY.

THE library illustrated on one of our inset sheets this week is a long room with a fireplace at each end, and, of the two sides, one is lined with bookcases, facing two quaint leaded casement windows on the other.

A comfortable feature of the room is the way in which the fireplaces are treated. A screen is thrown across the end of the room, about 5ft. from the mantel fitting, the upper part of which consists of a cupboard with roundels in the doors, and in the recesses on each side a reproduction of an old master. Below is a large face of green glazed bricks, with a bright iron grate in the semi-circular hob fire opening, while the small "pot-holes" on the right and left serve to break up what might be an uninteresting mass of colour, at the same time being very useful for receiving the glass or pipe of anyone who is sitting by the side of the fire.

Cupboards and shelves are continued round the ingle to the wings of the screen. Under these are placed seats covered in an old tapestry of a faded indigo—a restful colour, restfulness being an essential detail in such a room as the library. This completes the treatment of the inglenook, which is really a room in itself, to which one can repair to read or study, and obtain more seclusion than is possible in the middle of so large a room.

There is but one entrance to the room, which is in a recess at the centre of the bookcase side, thus giving no opportunities for making the library into a means of transit to other rooms, which would inevitably be done if there were a door at each end.

There are two bookcases, one each side of the door, terminating at each side on the inglenooks; these bookcases are the height of the frieze moulding of the room.

The windows opposite are so arranged as to throw a horizontal light on the bookcase; for this reason they are not carried up to the ceiling, as one would imagine to be the best, for it would only make the light too glaring to work by, and, from an architectural point of view, it would not do to spoil the symmetry of the elevations of the room by breaking the frieze, as the opposite side could not be treated in a similar way.

The table, of which only the top can be seen in the sketch, stands on two legs, the top being secured to the legs by means of brackets on each side.

The chairs are comfortably upholstered in pig-skin, a distinctive feature being the large copper-headed nails which secure it in the seat and back. The remaining portions of the walls below the frieze moulding are treated with narrow V-section match-boards. Into this, opposite the door, may be let a family portrait, or some other picture, with, perhaps, a loose seat under, about the same width as the door. This will have the effect of balancing the two sides of the room.

The frieze is carried out in broken, transparent colours of blue, green, brown, and gold, on a very coarse canvas, and thus makes a pleasant contrast to the severity of the woodwork below, which is of oak stained a dull grey colour, obtained by using a very dark stain diluted, and then slightly polished. The ceiling is set out in squares, by means of flat battens, which are stained to match the other woodwork, the intervening spaces being distempered a dull cream colour. The floor is stained a much darker colour than the other woodwork, and has a few Oriental rugs laid about at pleasure.

The London School Board Annual Report says that during the past year nine new schools, accommodating 8,942 children, have been opened at a total cost of £240,239 for sites, buildings, and furniture; or an average cost of £26 17s. 3d. per head. At Lady Day there were sixteen schools and twelve enlargements in course of erection, and thirty-five additional sites for new schools have been or are being purchased.

Views and Reviews.

ABBEYS AROUND LONDON.

This is a cheap compilation of facts relating to the numerous abbeys that surrounded London in the Middle Ages. The information given is interesting and there are many illustrations, but the printing is bad and the cover and headpieces are still worse. If the intention was to make the latter emblematic of the particulars that follow, a little more care and taste ought to have been observed in carrying it out, as a page with nearly a third of its space taken up by crude black letters and ornament is not calculated to please the eye. In a book of this class, this fact ought especially to have been remembered, for the information supplied is not new and it ought, therefore, to be presented in a pleasing manner. To render the book still less attractive to the eye, it is enclosed in a cover of a sickly yellow colour.

"Abbeys Around London." By John A. Randolph. London: The Mercantile Press, 190, Ebury Street, S.W. 1s.

CENTRAL ELECTRICITY STATIONS.

Mr. Gay, who is the electrical engineer to the Islington Vestry, and Mr. Yeaman, the assistant engineer, have produced a book that accomplishes its aim—which is what its name implies. For the experienced engineer it is not intended, and there is little in it of any real value to him, but it should prove very helpful to the young electrical engineer, the man who is completing his time in the shops and drawing office, and who will soon be looking about him for a position in this branch of his calling. Faraday made his important discovery of electro-magnetic induction in 1831, but nearly fifty years elapsed before the dynamo began to be used on any large scale. Since then, however, great advances have been made, and at the present time it is surprising to note how electricity for lighting and power purposes is being adopted. In 1889 there were very few supply undertakings doing actual work; now more than a hundred are engaged in the business. The authors complain, rightly, of the scamped wiring work that is often done and long for a Board of Trade standard set of rules, with penalties for non-compliance. As a good arrangement it is suggested that when electricity station buildings are in hand the engineer should draw up his own plans, the architect keeping his plans as nearly as possible to those of the engineer. This is sensible. How much better it would have been in many cases if architects had combined with engineers with regard to certain structures, and *vice versâ*. Often the architect describes the engineer's creation as hideous, while the engineer retorts that the architect's building, or bridge, is deficient in construction. The difficulty in matters of this sort is to decide who is to take the first step. There are thirteen chapters to the book under review, dealing with the numerous details connected with central station work, much useful information being given in the last chapter—on running and management. As stated before, the book can be recommended to those about to enter this branch of electrical engineering.

"An Introduction to the Study of Central Station Electricity Supply." By Albert Gay, M.I.M.E., and C. H. Yeaman, A.I.E.E. London; Whittaker and Co., 2, White Hart Street, Paternoster Square, E.C. 10s. 6d.

BUILDING SOCIETY CASES.

This should prove a highly useful book to those interested in the management and working of Building Societies. These compilations of cases affecting various subjects and trades or professions are increasing in number, for their usefulness in giving a knowledge of disputed points to the layman as well as the lawyer is apparent to everybody. In the work under review the cases are not given in the best order for ready reference, but this objection is reduced by the provision of an index. An important decision reported in this book is that of Seal v. Merthyr Tydfil Urban Council. In this action the owner was summoned under the Public Health Acts to abate a nuisance arising from a defective drain under the gardens at the rear of his houses, and was ordered to abate the nuisance by the justices, who held that the drain in question (into which flowed sewage from houses of the owner, as well as from adjoining houses, before it entered the sewer) was a "private drain" within the meaning of the Public Health Act, 1890. Against this decision the owner appealed on the ground that as the drain was used for houses belonging to different persons it was a "sewer," and as such repairable by the local authority. This appeal was dismissed, on the ground that the drain was a private one—*i.e.*, a drain constructed on private grounds to which the public had no access. An excellent feature of the book is the appending of side notes in small type in the margin, giving shortly the subject of the case and the decision.

"Judicial Decisions Affecting Building Societies: Reprinted from the 'Building Societies' Gazette,' 1897-1898."—Vol. III. London: Building Societies' Association, 73, Ethelburga House, Bishopsgate Street Within, E.C. Price, 5s.

MODEL ANSWERS TO EXAMINATION QUESTIONS.

Answers to Questions set in the Intermediate Examination held by the Royal Institute of British Architects, June, 1899.

By G. A. T. MIDDLETON and R. W. CARDEN, Associates R.I.B.A.

(Continued from page 288, No. CCLIII.)

IX.—THE SEVERAL VARIETIES OF CLASSIC ORNAMENT.

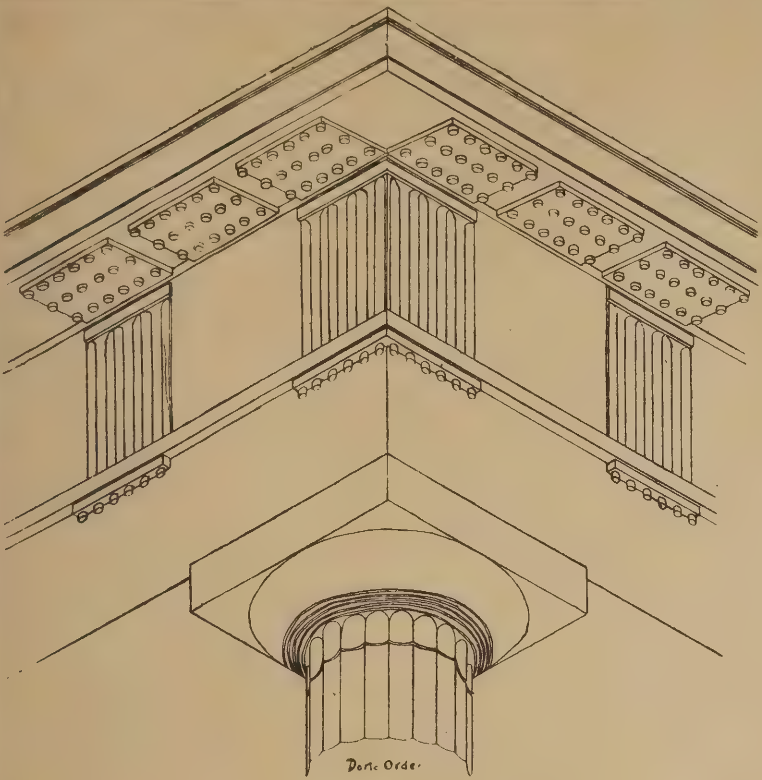
1. *Give a freehand perspective sketch (about 4in. high) of an angle of the entablature either of the Doric, Ionic, or Corinthian order, without pediment, but showing the cap of column.*

(See illustrations. Great care should be taken not to attempt to show too much detail, but all ornaments should be indicated in their proper positions.)

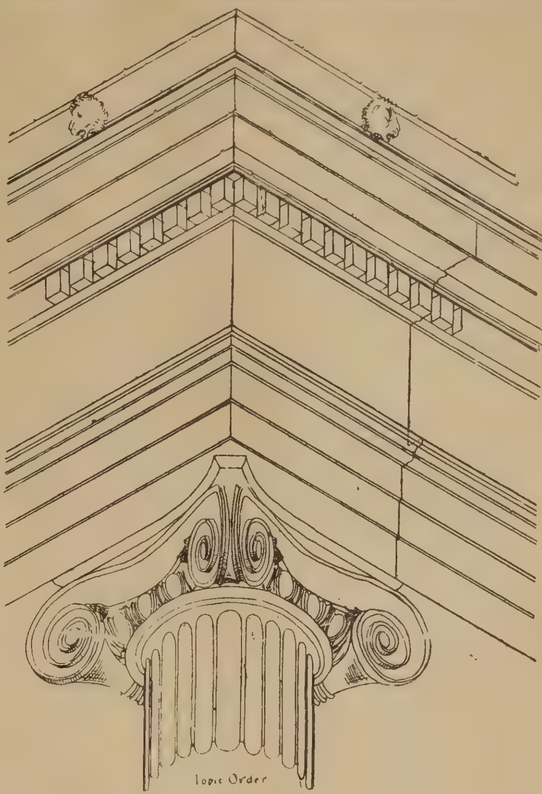
2. *Draw (to about 3in. high) one or two examples of Stele.* (See illustrations.)
3. *Give a section (about 1½in. high) of the mouldings answering to the following terms, and sketch their respective proper enrichments: Ovolo, Torus, Astragal.* (See illustrations.)

St. Marylebone Church Institute and Club at Paddington Street, N.W., was opened last Wednesday. In addition to a central hall, there is a library, and dining, reading, games, billiard, sitting, and bed rooms; access to the mission church is obtained at the rear of the institute. The total cost of the new building is about £9,000. Mr. T. Harris, F.R.I.B.A., of Bloomsbury, was the architect, and Mr. H. H. Sherwin, of Waddesdon, the contractor.

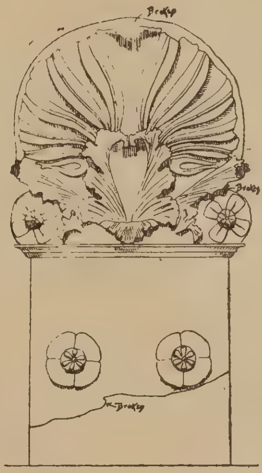
The Roman Villa at Brislington, Bristol.—We gave some particulars on page 340 of last week's issue of the discovery of a Roman villa at Brislington. Some mosaic pavement was found on land belonging to the Bristol and District Land Company, Limited, who have expressed their willingness to present the pavement to the local museum, and to allow further excavations to be made. It may be stated that during the excavations for the new road which laid bare the pavement, the workmen came upon an old road at a spot about fifty yards nearer to the main Bath road, at a depth of 4ft. or 5ft. from the surface; this was probably an old Roman road, and may lead to further discoveries.



Doric Order

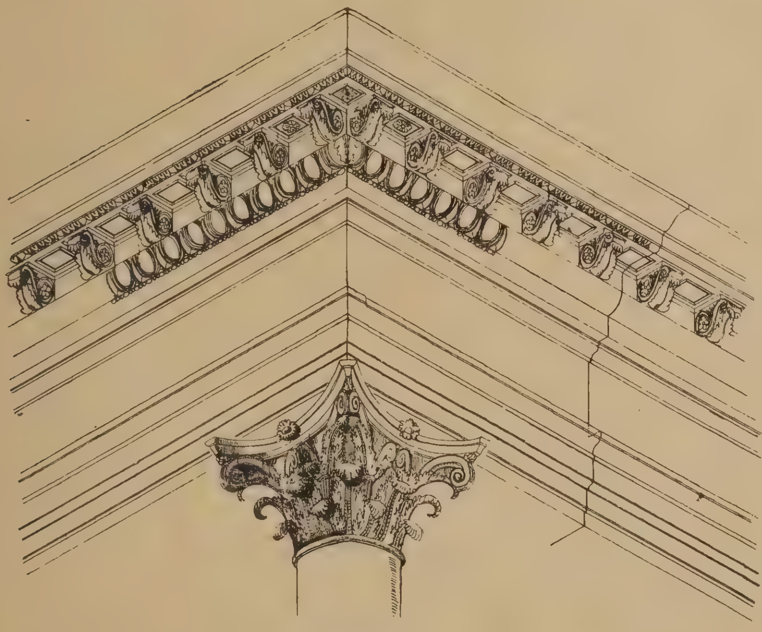


Ionic Order

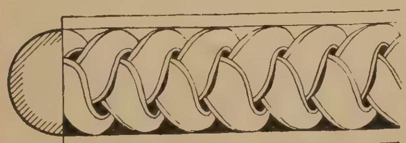


Stele from Athens.

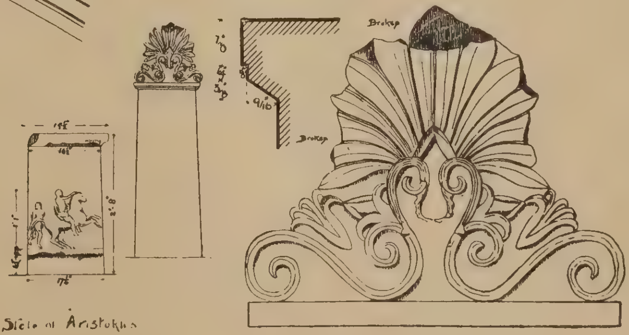
in the British Museum.



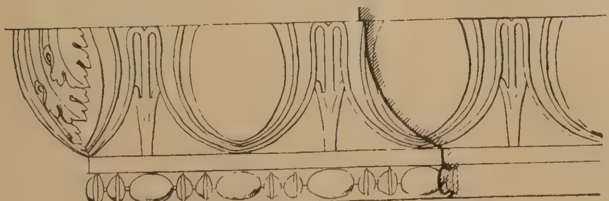
Corinthian Order



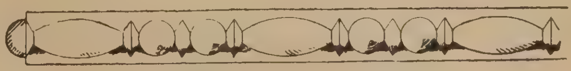
Torus, with Guilloche Ornament



Stele of Aristokles



Ovolo with Egg and Tongue Enrichment



Astragal, with Greek Bead Ornament

ANSWERS TO EXAMINATION QUESTIONS.

THE BUILDING TRADES IN 1899.

THE timber trade during 1899 has continued to prosper. Increasing profits have been made by the producing shipper and the carriers of timber. It is, however, doubtful if the importing merchant and large middleman have made profits commensurate with the strain caused by a growing impression that prices were unhealthily high, and the discontent at the screwing-up, which the increasing import-cost forced the merchant and dealer on this side to apply to the consumer. Large forward commitments were therefore a matter of difficulty and although the growing demand made the volume of "hand-to-mouth" business consistently good the adjustment of producers' and shipowners' views with those of consumers has been difficult and middle profit consequently lean. The heavy discount rates for trade bills with which the present year opens tends to further "whittle down" middle profits, but the growing reluctance to face up to heavy forward commitments causes a pleasing absence of unsound finance; and the timber trade generally stands on a sounder financial footing than has obtained for many years past. In last week's issue we gave details of the state of trade in many important centres; the following further particulars have since come to hand.

ENGLAND.

Barton.—Over fifty houses have been completed and tenanted during the past twelve months, and all of them were tenanted without disturbing the population of the older portion of the town. By far the most important branch of trade in Barton is the brick and tile manufactures, both as to the export business and the number of men employed. During the past season the weather was exceptionally favourable for making, and the demand being steady and continuous stocks were cleared out as fast as manufactured, except in the case of a few makers, who preferred to hold for a prospective rise in prices. This came at the end of the season and has continued, although probably the present weather will slightly check the demand.

Devonport.—There has been a steady improvement here in the building trade. The great civic function of the year was the opening of the new Technical Institute by the Mayor at the latter end of July, when Sir William White, director of naval construction, unveiled a coloured window. Another interesting ceremony was the laying of the memorial stone of the first block of workmen's dwellings in James Street. The building of another block in Morice Square is under consideration.

Driffield.—The building Trade has been brisk here, and the new church of St. John, in Lockwood Street, will be completed in two or three months. This is the most important of the buildings erected in 1899, and is the first episcopal church that has been constructed in the town since the thirteenth century. Improvements have been effected at the parish church by the erection of a wind porch at the west entrance, the seating of the tower basement and the filling in of a large window in the south aisle with stained glass.

Exeter.—The trade here is progressive. The most important building erected last year was the New Technical College, which has been added as a wing to the Albert Memorial Museum to commemorate the Diamond Jubilee of her Majesty the Queen. The first section of the new buildings of the West of England Eye Infirmary have been almost completed

Grimsby.—The past year witnessed the advent of a forward movement in public works, though as yet no very great strides of a practical nature have been taken. Probably the greatest have been the adoption of the electric light, with the building of a station at a cost of £43,500; the adoption of the Public Libraries Act, with the sanction of the Local Government Board to take over, alter, and convert the Mechanics' Institute into a free library; and various street improvements. A new fever hospital is just upon completed.

Torquay.—There have been no great municipal developments at Torquay itself, but at Goodrington the district council have several big schemes in hand, notably the conversion of the Marshes into a recreation ground and the provision of a water supply from Dartmoor. Much building has been done at Goodrington, and Mr. Paris Singer has been carrying out an important improvement in the construction of a marine drive in the direction of Torquay. The estate adjoining the drive is being laid out for building.

Truro.—The year has witnessed the inauguration of at least four things of the greatest importance to the city. The building of the nave of the cathedral has commenced. Delay and agitation extending over a quarter of a century have been brought to a conclusion by the adoption of sewage interception and disposal schemes, which will shortly be investigated by the Local Government Board. The third great enterprise is the Truro-Newquay Junction Railway. This new line, whose route lies by way of St. Agnes and Perranporth, will shorten by about one-half the present railway journey from Truro to Newquay, and it is certain to have a beneficial effect upon the whole district. During the year the new station at Truro has been completed and is now the finest in the county. The construction of stone bridges to take the place of the great wooden viaducts immediately to the east of the station has been commenced. Another movement pregnant with great possibilities for the welfare of the city is that which brought about the erection of the Central Technical Schools for Cornwall. The building cost over £7,000, and Mr. Passmore Edwards contributed £5,000.

IRELAND.

The progress in the building trades in Ireland will be evident from the returns of the Board of Trade, which show that £660,000, or £40,000 in excess of last year's total, was advanced on various loan services. The following are the more important channels in which this large sum has been distributed:—Improvement of farms by landlords and tenants, about £71,000; acquisition of glebes and erection of teachers' residences, £22,000; expenditure under the Acts for the improvement of labourers' houses, £110,000; improved and extended accommodation for lunatics, £240,000; housing of working classes in towns, and public health loans for water supply, roads, lighting, &c., about £118,000.

Belfast.—In a progressive city like Belfast, which is continually extending its borders, it is only natural that the building trade should be one of the most active local industries. Within recent years the number of new streets constructed and houses erected has been very large, and this class of work is still going on. The chief work, of course, has been the building of the new City Hall. The block known as the Scottish Provident Buildings at the corner of Donegal Square West and Wellington Place has been completed, and it is intended to continue this block further along Donegal Square West. At the other side of the square, at the Chichester Street corner, the Ocean Accident and Guarantee Company, Limited, intend to erect a fine block somewhat similar to that of the Scottish Provident Institution. It is probable that the two chief undertakings entered upon during 1900 will be the erection of the Royal Victoria Hospital and the Technical Institution, and as the former will cost not less than £70,000, and the latter close on £60,000, both these contracts will be very important ones. The past year has been most successful so far as local plumbing firms are concerned, chiefly to be attributed to the enforcement of the new sanitary bye-laws passed by the Council of the county borough and the erection of numerous residences in the suburban districts since the extension of the city boundary. The profits, however, have proved comparatively small, as all classes of material early in the year considerably advanced in price and wages increased in proportion to the demand for competent fitters and attendants. Owing to the demand from builders of small property having almost ceased, there was not much activity in the timber and slate trade during any portion of the year. The stagnation was useful in clearing out of the building trade many who ought never to have been in it, and legitimate builders should have a more satisfactory experience for the future. Demand from the large local contractors has been steady and that from country merchants fully up to the average. Prices abroad steadily increased from the spring time of the year, and they are now higher than they have been for many years past, and there does not seem to be any probability of lower rates being obtainable in the early future. Slates have been scarce, Bangors coming forward very slowly, while Americans have almost ceased to be used, as they were chiefly taken up by small builders, who are not now so much in the running as formerly. Laths and other goods in connection with the timber trade have steadily increased in value, and it may safely be said that prices are almost certain to remain upon the present high level for many months to come.

SCOTLAND.

Arbroath.—The building trades have fully maintained the previous year's activity, though the outlook is not considered to be quite so hopeful. A good many important street improvements have been carried out during the year. Amongst the buildings in prospect are the new shambles in Grimsby and the new epidemic hospital for the town and district. The work in connection with these should afford employment for a large number of hands. In the suburban districts large numbers of handsome villas have been erected, and there is still a demand for this class of residence. Numerous handsome blocks of working men's houses have likewise been put up during the year, and, notwithstanding the fact that many families have been obliged to migrate in consequence of the recent fires, there still appears to be a scarcity of working class houses of modern construction.

Carnoustie.—Building operations have kept pace with former years, a large number of residences of a superior class having been erected. The outlook for this year is not so hopeful, as it is expected that the increased value of money in the open market will have a tendency to retard the erection of property.

Leith.—Last year compares favourably with other years as to number of petitions presented to the Dean of Guild Court for construction of new work and alterations of existing buildings within the borough of Leith. Several large buildings have been completed, while others, which should by this time have approached completion, have been left unfinished owing to the crisis in the whisky trade. Ninety warrants were granted by the Dean of Guild Court during the year, one being refused. Owing to the high prices of all materials and labour and the high interest for draft rates at the banks there appears every prospect of the past financial prosperity of the building trade receiving a check, and quieter times may be looked for in the future.

Pitlochry.—A public hall is being erected from competitive designs submitted by Mr. Wilson, of Dundee. With the exception of this hall, the building trades have not been quite so busy as usual, and unfortunately the outlook is not altogether cheering.

The late Mr. Henry Vaughan's Will comprises a list of specific legacies to the National Gallery, the National Gallery of Ireland, the Royal Institution for Encouragement of Fine Arts in Edinburgh, the South Kensington Museum, and other public institutions that fills thirty folios. The art works bequeathed include Raphael's "Christ on the Mount," a picture by Landseer, a number of drawings and sketches by Turner and Constable, all the studies of pictures by Reynolds and G. R. Leslie, and statues of Reynolds and Flaxman.

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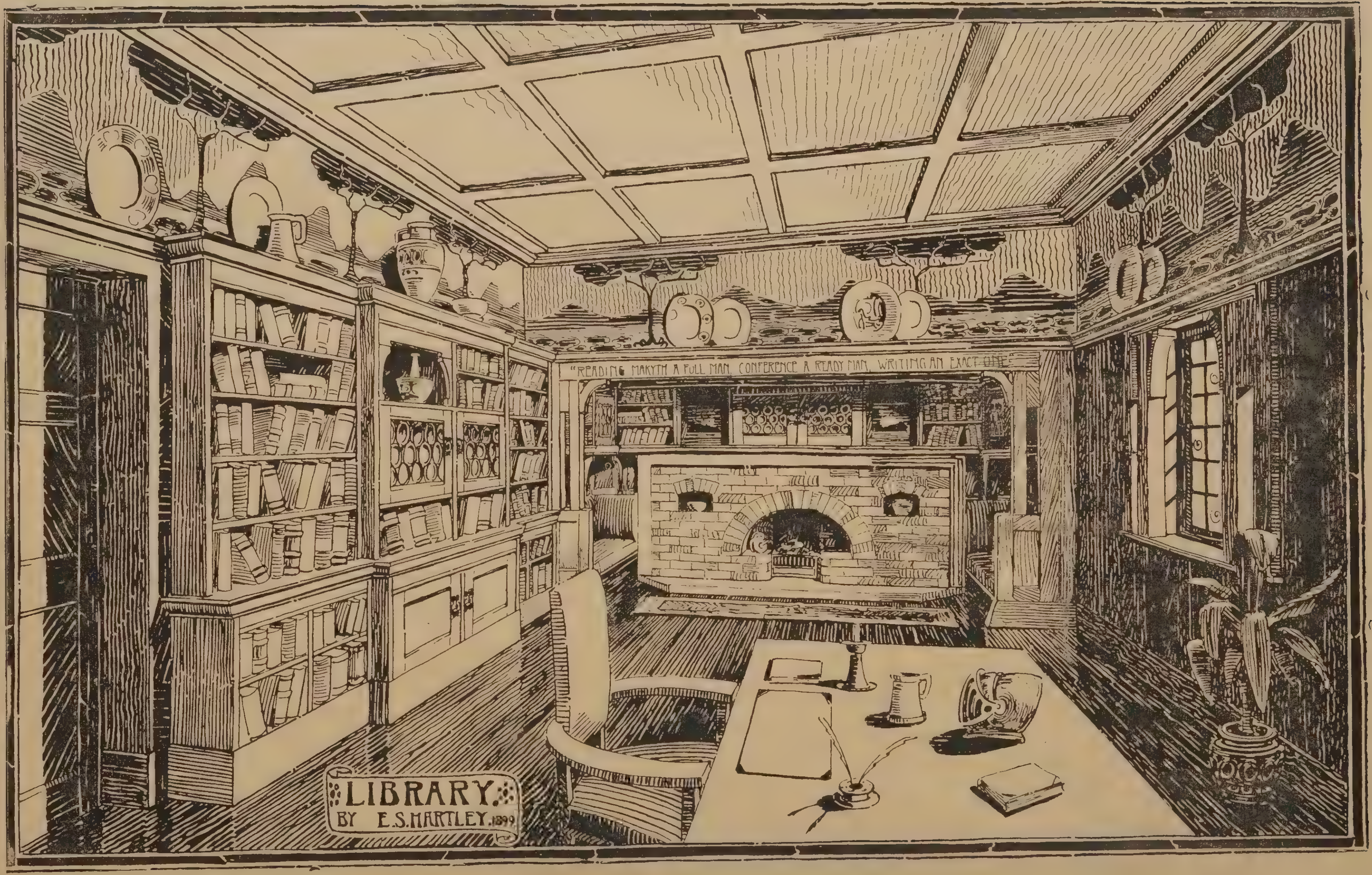
"READING MAKYTH A FULL MAN, CONFERENCE A READY MAN, WRITING AN EXACT ONE"
LIBRARY.
BY E.S.HARTLEY.1899

A MODERN FITTED LIBRARY. Designed by E. S. Hartley.

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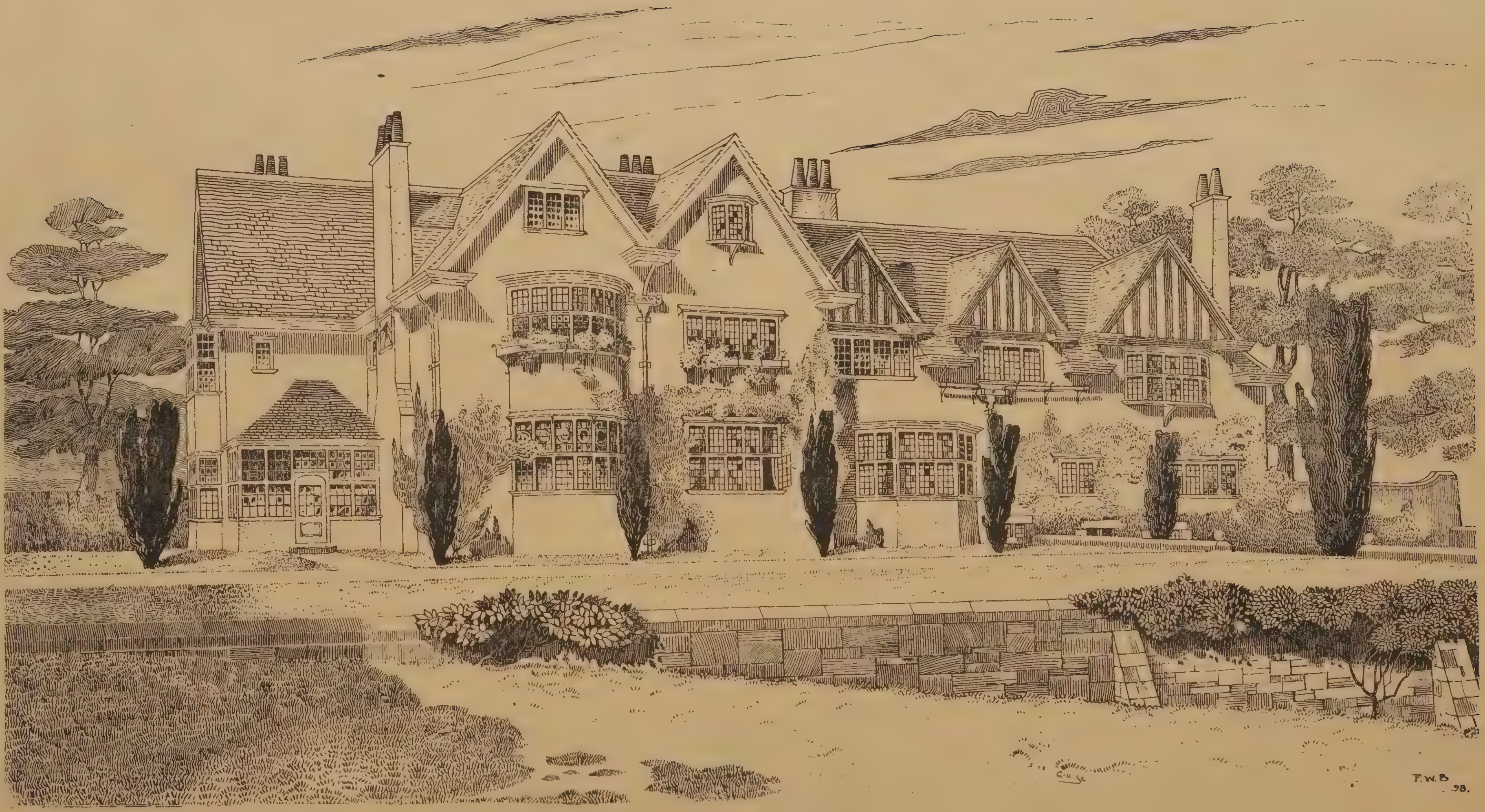
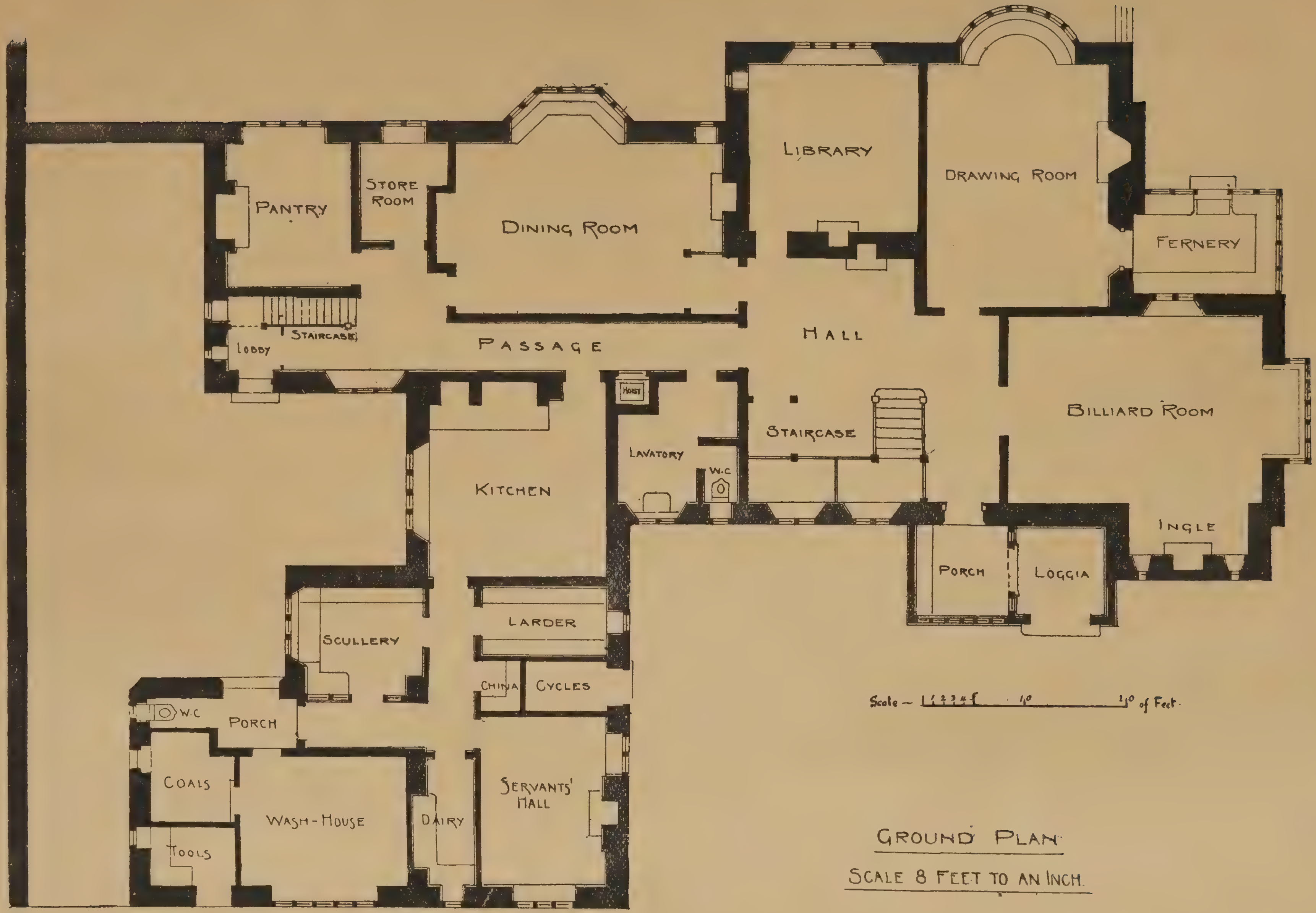
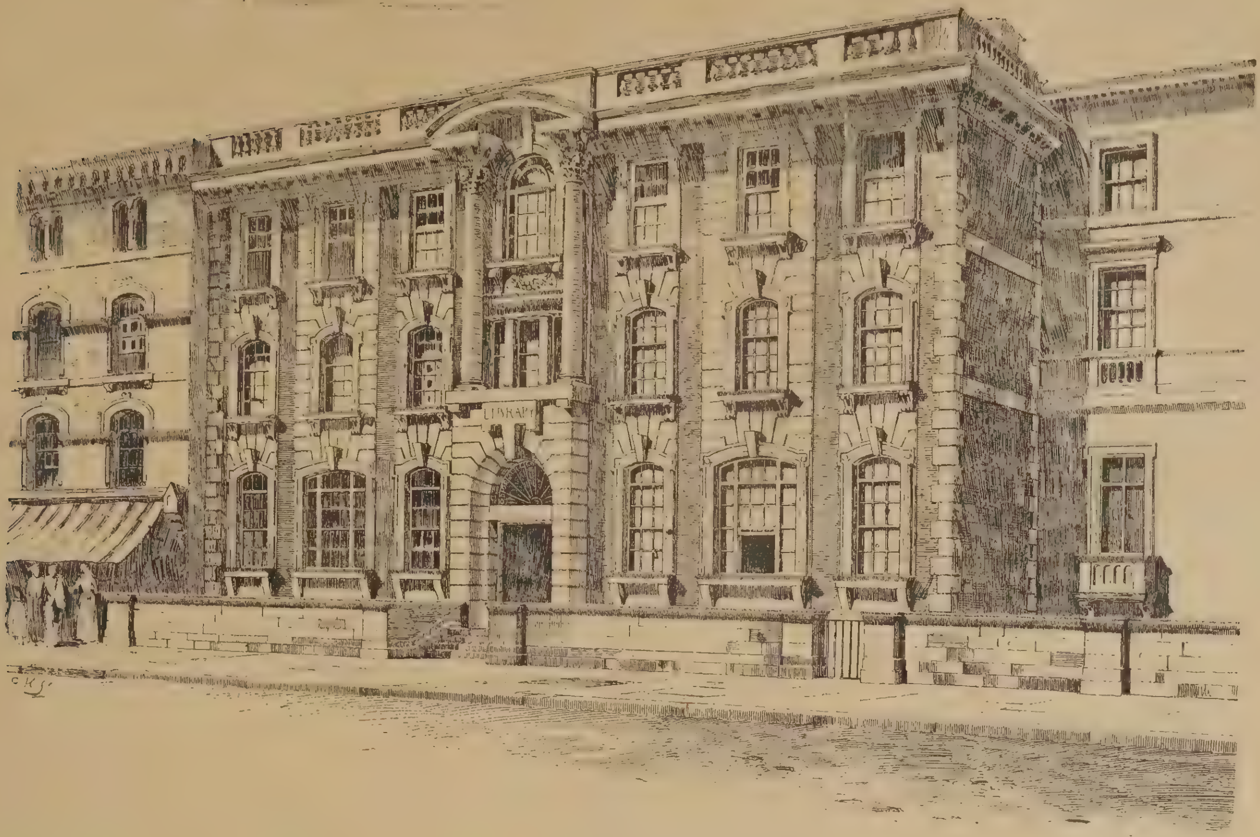


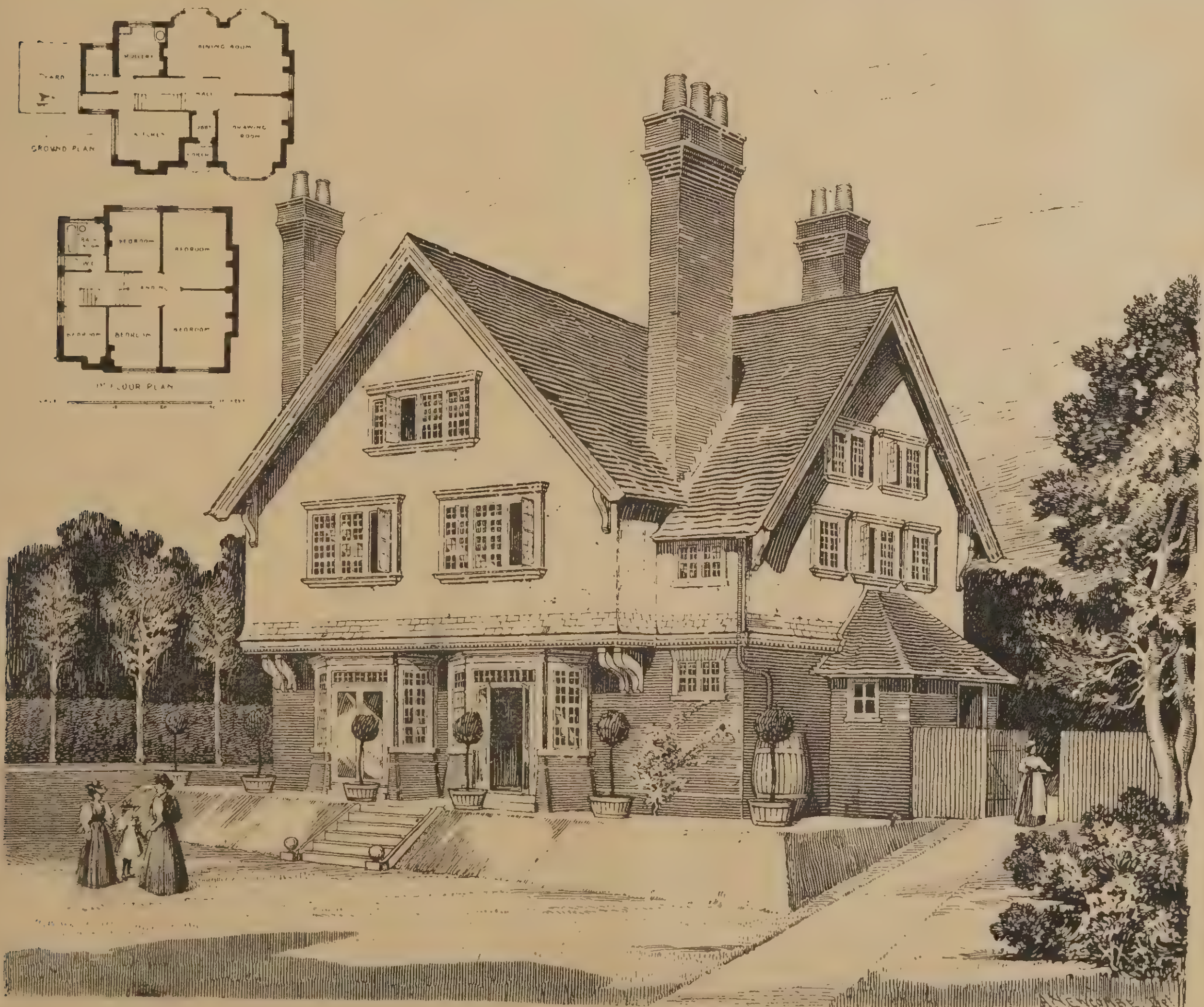
THE GARDEN FRONT "BRAHAN," PERTH. FRANCIS W. BEDFORD AND SIDNEY D. KITSON, ARCHITECTS.



"BRAHAN," PERTH: GROUND PLAN. FRANCIS W. BEDFORD AND SIDNEY D. KITSON, ARCHITECTS.



COMPETITION DESIGN FOR CENTRAL LIBRARY AT HULL. Francis W. Bedford and Sidney D. Kitson, Architects.



"THE GABLES," READING. W. Ravenscroft, Architect.

LIBRARY
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Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

BOOKS ON GOTHIC VAULTING.

GLASGOW. — A. G. writes: "Kindly inform me of any good work in which vaulting (especially Gothic) is treated."

The best books our correspondent can have are the three following: Willis's paper read before the R.I.B.A., on the "Vaults of the Middle Ages," now out of print, price 7s. 6d. nett, post free; "Rational Building," a translation of the article "Construction" in the "Dictionnaire raisonné de l'architecture" of M. Viollet-le-duc, by G. M. Huss, 12s. 6d. nett, post free; "European Architecture," an historical study, by Russell Sturgis, architect, 15s. nett, post free. The foregoing may be obtained from Mr. B. T. Batsford, 94, High Holborn, W.C.

PENCIL MARKS ON LATRINE WALLS.

ELGIN, N.B.—E. writes:—"The latrine walls of an academy here, which are plastered smooth on the masonry, are habitually defaced by pencil markings, and I am invited to suggest a remedy. To plaster with cement finished off the float would make the walls very gloomy, and to line with glass or encaustic tiling is very expensive. Can you suggest a wash or other means of combating scribblers?"

Possibly Messrs. Szerelmey and Co., Rotherhithe New Road, London, S.E., may be able to suggest one of their water glass washes, but glazed tiles form the best wall covering in a case of this sort. HENRY ADAMS.

ARCHITECTS' APPRENTICES.

BLACKPOOL. — Constant Reader writes:— "Wishing to become a competent man, what should bound apprentices do during office hours when he has no work. Lists of books, etc., will oblige?"

This question is vague because no particulars are given of the querist's present qualifications or experience or of the goal he is aiming at, other than to become "a competent man," which is an ambiguous description. Our correspondent will, however, find, by referring to recent back numbers of the BUILDERS' JOURNAL, several replies giving advice as to the best books to read. See also an article on page 268 of our issue for December 6th, 1899.

COMB-GRAINING.

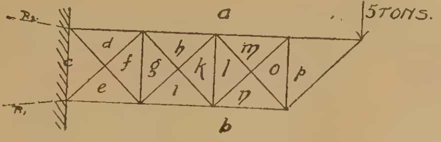
BRIXTON, S.W.—G. B. writes:—"Will you kindly inform me the meaning of the term 'comb-grain.' It was used in a specification of some work my firm recently did, of which I was the foreman, and our grainer interpreted it as meaning combing with a little figuring or graining. I had this done, and I am now told that I ought to have had the work plain combed. I see no mention in Laxton or Lockwood of comb-grain; each mentions plain combing or graining. I am told by a Manchester architect that comb-grain in the north of England is used to mean ordinary and inexpensive graining in distinction to plain combing and best graining. I see Lockwood mentions cheap graining?"

Although "plain combing" is the term in general use in the London district, the querist is entirely wrong in his interpretation of the term "comb-grain," the exact meaning of which is so self-evident—to me, at least. In cases where there is any doubt as to the precise meaning of any term, the old adage holds true: "Better ask the way than go a mile astray." H. E.

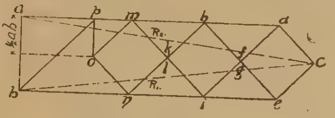
WORKING-OUT STRESSES.

TORQUAY.—A. B. C. writes:—"Will you kindly state how to ascertain the stresses in the various members of a framed wrought-iron cantilever (see accompanying illustration) by the graphic method? Middleton's "Stresses and Thrusts" only describes a simple crane or cantilever, and I do not know how to proceed beyond this."

The accompanying illustration shows the stress diagram required. The only difficulty lies in ascertaining the tension in the member between spaces *p* and *o*. The thrust in the member between *b* and *p* having been found, this must be resolved into vertical and horizontal components, when half of the vertical component will then be taken up by the bracing at bottom, and the other half transmitted by the member between *p* and *o* to the top. The other vertical members are not under stress. Or, by rule of thumb, as the spaces *o*, *l*, *k*, *g*, *f* and *c* lie half-way between the space *a* above and the space *b* below, so on diagram the points *o*, *l*, *k*, *g*, *f* and *c* will lie midway in verticality between *a* and *b*. Note, too, that the values and directions of the reactions are obtained by joining *c* to *a* and *c* to *b*. G. A. T. M.



WROUGHT-IRON CANTILEVER.



STRESS DIAGRAM.

CONCRETE WALLS FOR COUNTRY HOUSES.

EALING, W.—H. writes:—"Would you kindly tell me what are understood to be the advantages and disadvantages of these walls on a hill in a high chalky district. Will they stand wind and weather as well as brick, and is any special method of construction recommended? Are they liable to make a house cold, and will the resonance be sufficiently apparent to be inconvenient?"

In a chalky district, cement should be cheap, and cement concrete cheaper in proportion, than brickwork. If built with good foundations, concrete walls stand well and keep out the weather. The interior of the dwelling will be less liable to fluctuations of temperature than with brick walls, but a damp day after cold weather will be apt to set the inside walls streaming. Care should be taken to use the cement cool, and not to work at the face in wet or frosty weather. Ventilation must be specially attended to. The resonance is sometimes objectionable, but is less with porous material for the aggregate of the interior walls, such as pumice or coke breeze. HENRY ADAMS.

THE ERECTHEION.

MANCHESTER.—STUDENT writes: "I have read Mr. Marshall's interesting articles on Greek architecture in recent numbers of the BUILDERS' JOURNAL, and I would like to know what he considers the most correct work on the Erectheion."

Complete information respectnig the construction and details of this building is not, I believe, to be found in any single work on the subject. The most valuable contributions are the papers printed at various times in the journals of the societies established for the study of Greek archæology in Athens, England, and America. In the Athenian "Practica," the "Journal of Hellenic Studies," and the "Journal of the American School of Classical Studies," Boston, will be found material for complete drawings of the building as it now stands, with almost every joint correctly shown. These papers may well be supplemented by some diagrams in the last edition of Mr. Penrose's "Principles of Athenian Architecture," and by the more popular yet comprehensive account in Miss Harrison's "Mythology and Monuments of Ancient Athens." Stuart and Revett and Inwood are interesting and useful because they show portions of the building which have disappeared since their time; but Inwood's working details for the church of St. Pancras should have been kept out of his book, as they are apt to get mixed up with the Erectheion. For details "Student" should visit the British Museum. Some practical details will be found in Durm's "Die Baukunst der Griechen," and fragments of sculpture from the frieze are given in Schone's "Greek Reliefs." The inscriptions relating to the building will be found translated and explained in Wilkins' "Prolusiones Architectonicæ," Newton's "Greek Inscriptions in the British Museum," and also in the journals above referred to. Lastly, I may refer querist to a paper by Mr. Fergusson in the Transactions of the R.I.B.A., 1876. This by no means exhausts the bibliography of the subject, but a great deal has been written which need not be read. JOHN A. MARSHALL.

A QUESTION ABOUT DRAINS.

NORTHAMPTON. — BAYSWATER writes: "I shall be pleased if you will kindly reply to the following queries:—The drainage from house No. 1 is connected to that of house No. 2, and has been for many years. The owner of No. 2 had orders from the Vestry to put in a new drain to his house, and now the work is finished he asks me, as owner of No. 1, to pay £10 towards the cost of the drain. If I had been consulted before the work was done I could have so arranged that it would have cost much less than it has. (1) As the No. 1 drains have been passed as good, and time gives me an easement, can I be compelled to pay a portion of the cost? (2) Am I required to provide a storage cistern where there is a constant supply from the water company's main in London?"

(1) Where two or more houses belonging to different owners are connected with a public sewer by a single private drain, the local authority can, under section 19 of the Public Health Acts Amendment Act, 1890, compel the owners to contribute proportionately to the expense of repairing such single drain, the proportions to be settled by the local authorities' surveyor, or, in case of dispute, by a court of summary jurisdiction. When the necessary work has been done by one owner, the local authority will probably take no action; but it appears that the said owner has a valid claim against the other owner, provided that he himself was legally liable. In cases where the local authority has not adopted Part III. of the above-named Act, it appears, from several legal decisions, that a drain which receives the drainage of two or more houses is a "sewer" for all purposes of the Public Health Acts except the above. The Act of 1848 vested all "sewers" in the local authorities, who are liable for the expenses of repairing the same, except under the circumstances explained.

(2) It depends upon the provisions of the special Act under which the water is supplied. Under section 54 of the Waterworks Clauses Act, 1847, if by the special Act it be provided that the water need not be constantly laid on under pressure, every person supplied must, when required by the undertaking company, provide a proper cistern, with ball and stop-cock, etc. G. H. B.

BUILDING SOCIETIES AND PROPERTY BUYING.

GOLD COAST, BRITISH WEST AFRICA.—S. writes: "I shall feel much obliged if you will enlighten me on the following points:— (1) I wish to purchase land for building purposes. Would I do well to go to a building society? (2) Would it be safe to leave the title-deeds of such land in the hands of the society? (3) After once the land is bought, would there be any rent which I should have to pay, or would that land be wholly and absolutely my own? (4) Kindly oblige by giving me any other particulars you can, so that when purchasing I may feel satisfied that I am legally entitled to the lands I have bought, and that the documents transferring the land into my hands are legally correct."

(1) Whether you should go to a building society or not must depend on whether you require an advance for the purpose of your purchase or not. If you do, you will probably find it convenient to obtain it from a building society. (2) If you obtain an advance from a building society, you will have to give them a mortgage on the property, and they will be entitled to get up the title-deeds, and retain them until the mortgage debt has been paid off. The deeds will be as safe in the possession of a respectable building society as anywhere. (3) This would depend upon the nature of the estate in the land which you acquired. If you bought the fee-simple of the land, it would become yours absolutely free from the payment of any rent, but subject possibly to such outgoings as tithe rent charge. If the person from whom you bought the land held it on lease at a rent, you would take it for the term of the lease under which he held it, and subject to the rent reserved by, and the covenants contained in, the lease. Or, though the person from whom you acquired the land might be himself the owner in fee-simple, he might be unwilling to part with his entire interest, and would only agree to grant you a lease for building purposes for a term of years, at a rent. (4) It is quite impossible for us to give you the particulars you require. No one but a lawyer can possibly form an opinion on the question of title to landed property which it would be safe to act upon, and a lawyer can only do so when he has had before him the deeds and documents by which the title is deduced, and has made the necessary investigation and searches. Nothing should induce you to act as your own lawyer in so serious a matter, where you are going not merely to lay out money in the purchase of land, but to expend further sums in building upon it. If you so desire, we will, in a private letter, give you the name of a solicitor in whose hands your interests will be perfectly safe, and who will probably be able to find the class of property which will suit you. Further than this we cannot help you.

A. H.

PURIFYING WASTES.

Reigate, Surrey.—C. E. S. writes:—"Is there any simple means by which the wastes of bath and scullery may be so purified that they may be used to run into an artificial pond in the garden?

No method can be recommended which will provide a cheap and simple means of purifying the fouled waters from a bath and scullery sink, so that the effluent may be run directly into an artificial pond. For a simple and inexpensive method of bath and sink water *disposal*, a filter bed and filtration gutter, as suggested by Dr. G. V. Poore in his well-known work, "The Dwelling House," might be adopted provided the local circumstances are favourable.

T. E. C.

VALUATION OF REPAIRS.

Daventry.—Arson writes:—"Is it necessary for an architect to hold a valuer's licence to enable him to go on to premises where a fire has occurred, and to give to his client (who is a company) a written estimate of the cost of repairing the damage done to the premises by the fire? If architect's estimate is produced in court, could it be considered as a valuation?"

It is not necessary for the architect to hold a valuer's licence, because his valuation will be made for the information of one person only—the company, who are his clients—and is not obligatory as between parties. If the estimate made by the architect is produced in court, it could not be considered as a "valuation" within any enactment requiring a valuer to hold a licence. See 46 Geo. 3, c. 43 (Eng.); 5 and 6 Vic., c. 82, s. 19 (Ir.); and Stamp Act, 1891, s. 24, and Sch. 1.

A. H.

Bricks and Mortar.

Aphorism for the Week.

"*Architecture is thought behind form.*"—W. R. Lethaby.

Brahan, Perth: The Garden Front. One or two designs for this house for R. D. Pullar, Esq., were made, but that reproduced on one of our inset sheets this week shows the house as completed. The walls are built of stone, the whole being afterwards rough cast. The roofs are covered with green Westmorland slates. The hall is panelled in oak about 7ft. high, and has an oak staircase; above the panelling is a plaster frieze of roses and honeysuckle, modelled by Mr. G. P. Bankart. The dining-room is panelled in oak about 8ft. high, with panels inlaid with flowers; it has an oak-beamed ceiling and ingle nook, with copper *repoussé* panels by Mr. Edgar Simpson, of Nottingham. The library has bookcase fittings, chimney-piece, and dado of walnut inlaid and rosewood. The drawing-room has a panelled dado, chimney-piece, &c., of cedar, inlaid with mother-of-pearl, and has a plaster ceiling modelled by Mr. G. P. Bankart. The billiard-room has an oak-beamed ceiling resting on carved stone corbels, and an oak dado about 5ft. high. The ingle nook is in stone, and is carved with subjects representing Day and Night and the common flowers of the district. The interior of the nook is decorated with tilework by Messrs. C. W. Williams and Co., of Manchester. The two principal bedrooms are panelled in white painted woodwork, and the whole of the windows are in leaded lights, those of the principal staircase being by Mr. Stephen Adam, of Glasgow, and those of the drawing-room by Mr. Geo. Walton; the remainder of the ornamental glazing has been made from full-size cartoons by the architects (Messrs. Francis W. Bedford and Sidney D. Kitson, of Leeds), and carried out by Mr. W. Pape, of Leeds. The sanitary, heating, and electric-lighting arrangements have been carefully considered.

The design for the Central Library at Hull (which we also illustrate on one of the inset sheets) was submitted by Messrs. Bedford and Kitson in the recent competition. The materials intended to be used were brick and stone.

"The Gables," Reading. This house (see inset sheet), the residence of its architect, Mr. W. Ravenscroft, of 22, The Forbury, Reading, is situated on high ground in the west suburb of the town, and the site being a sloping one the house is placed on a terrace, beneath which is a tennis lawn and further down the hill a small orchard. The dining-room, as will be seen by the plan, is so arranged that it can be divided into two rooms, and the accommodation, in addition to that shown on plans, consists of two very large attics, with box rooms, &c., and ample cellarage, cycle house, &c. The materials chiefly used are old brick, brown tiles, and rough cast. Messrs. Collier and Catley were the contractors.

A Museum of Living History. Mr. Henry A. Spaulding, a well-known man in America, has evolved a scheme for building a "museum of living history," which is to become, it is hoped, the Parthenon of the United States. Plans and elevations have been prepared by Mr. George B. Post, which show a huge building in the classical style, with an immense dome. Part of the plan is to build a huge stone quay, from which a mighty stair, ornamented with statuary, will lead to the museum. It is proposed to acquire a site on the upper coast side of New York City. The material to be used is gray granite and marble, and the ground plan is that of a cross, superimposed on a circle. This circle is 800ft. in diameter, and it incloses five circular galleries—two concentric circular galleries on the main floor, having together a width of 125ft., two below these, and one above the outer gallery. The outer circular gallery thus has two stories above the ground; the inner circular gallery has one. These circular galleries are intersected diametrically on the ground floor by four wings at right angles to each other, each having a length of 800ft., a width of 200ft., and a height of 35ft. These four wings are to be known respectively as the Donors' Hall, the Hall of Literature, the Hall of Religion, and the Hall of Gifts. They will be surmounted, at their intersection, by a central and open dome, rising to a height of 404ft., and having at its base a diameter of 250ft. The interior of the building is carefully and elaborately planned to systematically and comprehensively represent every branch of art, science, and industry—every form of human endeavour. The provisional builder's estimates of the proportions of this building are for a structure to cover about nine and one-half acres of ground. The length and width of the building, 520ft.; floor surface of rotunda, 24,328 sq. ft.; four entrance halls, each 11,448 sq. ft.; four inner galleries, each 3,230 sq. ft.; four outer galleries, each 5,616 sq. ft.; one first floor, including stair halls, &c., 130,880 sq. ft.; second storey, 51,464 sq. ft.; in all, 182,344 sq. ft. Picture lines, rotunda, 496ft.; inner galleries, 944ft.; outer galleries, 1,164ft.; upper galleries, 4,056ft.; in all, 6,660ft. The cubic contents of the building are to be 17,736,355 cubic feet, of which 4,605,488 cubic feet are below the first floor.

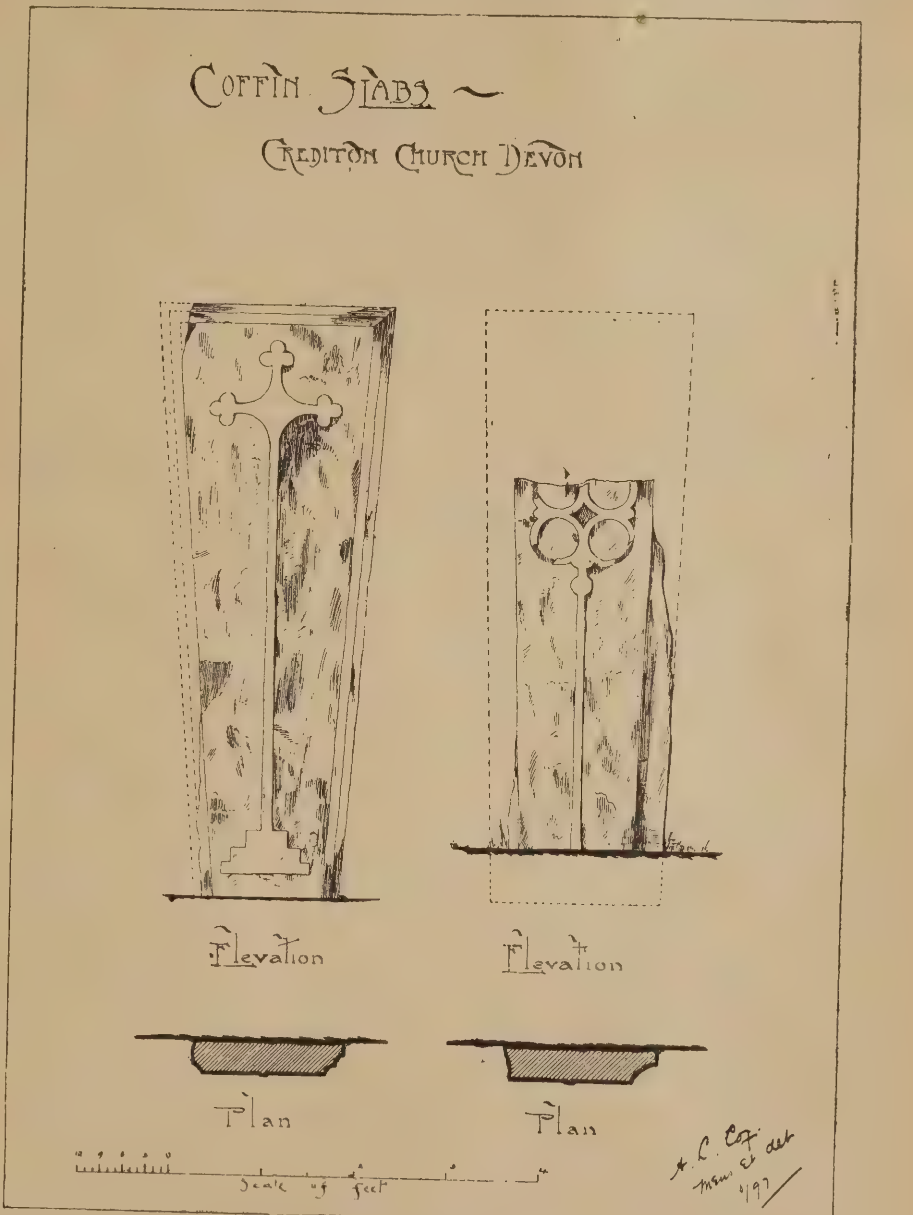
Monuments to Art and Industry. Mr. Spaulding has had a wide experience in art matters, and in explaining his plans he says:—"As man progresses and learns the steps by which he has climbed out of the past, surveying the rude ladders upon which he has mounted, a natural desire arises to mark off the heights he has gained by white monuments, carved with nicest cunning and reared not alone for his own satisfaction, but to point other more tardy climbers. Thus is born the exposition, the centennial, the world's fair of the nations. By these aggregations of art and industry the people of the whole earth come in touch with each other. Such was the first World's Exposition, the Crystal Palace of London; such was the International Exposition at Paris; such was the magnificent World's Columbian Exposition, and such must be all those to which the future is to give birth. Such a monument of progress is the South Kensington Museum, an outgrowth of the Crystal Palace. In this great school, founded by the late Prince Albert, one of the most enlightened minds of his time, with its means and adjuncts for education, we see a speaking illustration of what can be done by vital force. It is safe to say that its influence upon the minds of the British people is greater than all the inactive art collections of Great Britain put together. It is real eloquence; the rest are sermons delivered with folded arms and closed eyes. The Kensington Museum from its first foundation became at once a potent influence in the cause of art among the people of the British Isles. It has proven of inestimable value to them, and its influence is now felt in the remote corners of Her Majesty's dominions and of the world. America should have its Parthenon—a worthy abiding monument to its ever-accumulating evidences of the great part it is destined to play in the story of the nations."

English Influence on French Art. In a series of articles by Claire de Pratz on "Why we are not loved in France," now appearing in the "Westminster Gazette," it is stated that the French, seeing the effect of English training, make an earnest effort to assimulate what they judge to be the best of English life, customs, education and art. So great is this movement towards the comprehension of English methods in France that an apt word has been coined to express it—"l'Anglo-Saxonisme." In art its influence has been very important. The Pre-Raphaelite school in painting and Mr. Morris's teaching upon home decoration have had the best possible effects upon French Art. Some six or seven years ago the Sar Peladan inaugurated the Salon de la Rose-Croix, which in aim and effort rather resembled the defunct Grosvenor Gallery, allied to the better draughtsmanship and technique of the French school. The result was the discovery of such men as Armand, Point, Séon and Knopff. The works of Watts and Burne-Jones exhibited at the Paris Exhibition of 1889 also helped greatly this new art movement in France. Ruskin and Morris were read and translated, and a distinctly fresh movement took place among the decorative arts resulting in the creation of a new department devoted to decorative art exhibits in the two yearly salons. White enamelled and green ash furniture was imported from England, and became extremely fashionable in Paris. The art fabrics of Liberty became popular and were imitated by the Louvre and the Bon Marché, while such new French houses as Jeanselme's Modern Styles in the Rue Royale and Bing's Art Nouveau in the Rue de Provence cropped up everywhere.

Submerged Towns. TRADITION speaks of many submergences of populous places and history records the existence of towns which have long since been overwhelmed by the encroachment of the sea, notably Great Meols on the Cheshire coast and Dunwich the capital of East Anglia in the time of the Heptarchy. Modern necessities have led to the deliberate sinking of some hamlets. Seven years ago a village was hidden under the waters of Lake Vyrnwy, the great reservoir constructed by the Corporation of Liverpool to supply that city and its suburbs with pure water from a sequestered valley high up among the mountains of North Wales. The valley itself, which involved the creation of a most beautiful lake, and not simply taking possession of one, afforded a splendid site for a reservoir, since it was originally the bed of a lake cut out by a glazier, and filled up in after ages by accumulations of rock, washed down by the rains, until it became dry land. The conversion, however, necessitated the entire submersion of the village of Llanwddyn, with its parish church dating back to the Elizabethan period, a Wesleyan Chapel, and the Powis Arms Inn and two other public-houses, the dwellings of from forty to fifty inhabitants; also Eunant Hall, the seat of Sir Edmund Buckley, near the head of the lake, and a bridge or two over the River Vyrnwy. The Liverpool Corporation purchased 13,000 acres of land on the high ground in the neighbourhood, and there erected a new village, with parish church and chapel, for the ejected inhabitants, also reverently removing the dead to a new churchyard. A very similar undertaking is now in progress at Caban Coch, some twenty miles to the south, where a reservoir to hold 200 million gallons of water for the supply of Birmingham with pure Welsh water is being constructed. This reservoir has also necessitated the building of a new Baptist Chapel, to replace one which will be submerged higher up in the Elan Valley, and again bodies have had to be removed from an old churchyard and re-interred.

German Excavations in Greece. IMPORTANT excavations at Palatia, in Asia Minor, a village built on the site of the ancient Miletus, were commenced last October under the auspices of the Royal Museum of Berlin. Great things are expected by the German archæologists from this mission, though this ground is anything but virgin soil to the excavator; the British Museum holds a series of seated statues, of a very archaic type and of high importance in the study of early Greek art, which were discovered by the late Sir Charles Newton on the sacred way leading from the sea coast to the ancient shrine of the Didymæan Apollo, near Miletus; and the mission headed by Baron Edmond de Rothschild brought home many years ago the extensive and finely-preserved remains, now housed in the Louvre, of the later Ionic Temple of this divinity erected there, which almost rivalled in size, elaboration and splendour of decoration the second Temple of the Ephesian Artemis on the same coast—both these temples immeasurably surpassed the Doric Parthenon in extent and in profusion of decoration and sculptural adornment, though they could not compete with it in subtlety and rhythmic elegance of proportion or in sovereign beauty of style.

Coffin Slabs at Crediton Church, Devon. IN the south transept of Crediton Church, placed in an upright position against the south wall, is to be seen the large coffin slab shown in the accompanying illustration. It measures 6ft. 4½in. long and is 4½in. thick, its section being flat with a double hollow moulding at the side and ends. That on the right side is broken away. A raised simple floriated cross, standing on three steps of unequal height, occupies nearly the entire length of the slab. The other coffin slab illustrated is a fragment bearing traces of a raised floriated cross of more elaborate design and of the wide hollow moulding which enriched the edges of the complete stone. The fragment stands against the outside face of the east wall of the same transept, and is 4ft. long and 4½in. thick. The slabs removed from their original positions, by far the oldest monuments in and around the church, appear to date from the twelfth century, and doubtless marked the resting place of some distinguished ecclesiastic belonging to the early church. The dotted lines show the portions broken away. The drawings are by Mr. A. L. Cox.



MEASURED AND DRAWN BY A. L. COX.

Excavations in Rome. THE church of St. Maria Liberatrice in the Forum, which was wedged in between the roots of Caligula's palace and the temple of Castor, has been purchased for about 375,000 lire. The history and name of this church take us back to almost Pagan times, and in the mediæval days it was known as St. Maria dell' Inferno. This title originated in an early legend of a dragon whose pestilential breath killed all who came that way, but which was finally slain by St. Sylvestro. According to an ingenious and probable surmise of the late G. B. di Rossi, this dragon may merely have personified the Pagan fire-worship of the Vestals, which reluctantly succumbed to the powers of Christianity. The Vestal temple was situated within a stone's throw of the church. Whether this was the actual case or not is not provable. Nevertheless, the ancient springs of Juturna, which are situated almost beneath it, have at various periods caused pits and pools to form thereabouts by reason of subterraneous erosion of the tufo-rocks. Whether hot springs emitting vapour have made themselves temporarily aggressive on any of these occasions we are not told. One might almost venture to suggest a new idea, and question whether the pestilential breath of the dragon may not have been in reality that of the then lost-sight-of "Cloaca Maxima," which, unknown to the mediævals, was running below their feet hard by, though perhaps now and then choked with rubbish.

Correspondence.

CLERK OF WORKS EXAMINATION.

To the Editor of The Builders' Journal.

Bowes Park, N.

Sir,—In further reply to your correspondent, "King Frost" (see p. 340 of last week's issue), there is an examination for Clerks of Works, held annually in June, by the Worshipful Company of Carpenters, in which there is no age limit, but it is practically restricted to carpenters, as a day's work in that craft forms one of the items in the examination. All particulars can be obtained from the clerk to the company, Carpenters Hall, London Wall, E.C.—Yours truly,

G. ELLIS.

"QUANTITIES AND QUANTITY TAKING."

To the Editor of The Builders' Journal.

Tunbridge Wells.

Sir,—Your reviewer of this book by Mr. Davis suggests what he calls a very good plan of "taking off." I have not seen Mr. Davis' book, but may I suggest what is for many purposes an excellent method, namely, "taking off" floor by floor and clearing out every trade before going to the next floor. This may be a little longer than some methods, but it has many advantages, two of which are that the "taking off" can be done by two men (one begins at the roof the other at the basement) and that the dimensions for any particular item being *all together*, their omission, if necessary in adjusting variations, is most easy and complete.

It seems that there are a number of methods of "taking off" different parts of work that might be altered with much advantage. For instance, linings of whatever width (to doors, windows, &c.) should be measured run. This is much better than measuring super, and perhaps better than measuring bead and rebate and groove to frame, &c. This method obtains in the North and is a better one than used by many London surveyors.—Yours truly,

H. B. JOHN, P.A.S.I.

PRESIDENT KRUGER'S HOUSE.

Exeter.

Sir,—The description of the above house, given on page 341 in your issue for last week, is not strictly accurate from an architectural point of view. The lions at each side of the main entrance are not of stone but of marble, and are not at all bad copies of Landseer's well-known lions at the foot of Nelson's column in Trafalgar Square, though considerably under life-size (they are about 4ft. from out to out). They are fixed, facing each other, upon common wooden pedestals, which detract a good deal from their dignity.

The President's residence is situated on the outskirts of Pretoria, five or six minutes' walk at the outside, from the central square of the city. It stands nearly flush with the footway, which, immediately in front of the actual house, is paved with terra-cotta slabs. There is no other paving near, so that the sole approaches are either all mud or all dust, according to the season of the year.

Kruger's actual residence is a low one-storied stuccoed building painted white, covered in with the usual corrugated-iron roof, low in its central ridge, but rising and terminating with a slightly elevated gable at each end. There is a narrow and continuous varandah running the full length of the front. The garden is only a few yards wide, and is separated from the roadway by a low fencing of painted wood. It is pleasantly shaded by a row of tall eucalyptus and blue gum trees. It is under the verandah, or stœp, where the President (like all Boers) sits in his hours of leisure; and there I had coffee with him little more than a year ago. The look-out, from there, is very rough and ready; the roadway is much as nature left it. A few poor homesteads are built on either side of the Presidents' house, whilst in front all is a dreary waste, save that a particularly ugly chapel has been erected immediately in front of the presidential edifice. This chapel is of red brick with local stone dressings and is covered by an iron roof, the ridge of which is capped here and there by huge bulb-like ventilators of zinc, most ungainly and unsightly to the eye. Right in front, thrusting itself most obtrusively almost into the road, is an uncouth tower and spire of zinc. In the former is a clock with its face painted a particularly ugly blue. This clock has no hands. Telegraph and telephone wires galore run past Mr. Kruger's house attached to the iron telegraph poles (there are no wooden telegraph posts in South Africa); but I noticed his residence was not connected by either telegraph or telephone.

A few minute's walk past the President's house is the cemetery where our soldiers who died, or were killed, in the siege of Pretoria in 1880 are buried. Their memorials, like those of all our soldiers I saw in South Africa, are in a forlorn and neglected state.—Yours obediently,

HARRY HEMS.

SEWAGE PURIFICATION WITHOUT FILTRATION.

To the Editor of The Builders' Journal.

London, E.C.

Sir,—We have read with great interest the paper on the above subject in your issue of December 27th, by Mr. W. Kaye Parry, M.A., A.M.I.C.E., and with your permission should like to hear more in detail the arguments supporting the statements made by the author as to the superiority of the oxygenizing system by chemicals over that of intermittent filtration through biological beds, more particularly as regards the relative cost.

In our experience, we have found the latter system more effective and less costly, both at first and for maintenance, than any system where chemicals have been used.

For the last eight years we have been dealing with sewage purification in small installations, such as are required for country houses or villages, and have used chemical precipitants, the small amount of sludge and mineral detritus being easily separated and disposed of.

The first cost of these installations has been so heavy, owing to expensive apparatus required for raising sludge, and applying chemicals, that we have adopted the biological system on account of its lower initial cost and greater efficiency. This apparently has not been the experience of the author of the paper, who said, "that additional evidence was still needed to show which was the most economical method."

It is possible to put down a set of biological beds at about 25 per cent. less first cost than a chemical plant dealing with the same quantity of sewage; a better effluent is produced, and there are these additional advantages—the biological beds fill, stand, and empty automatically, the only attention required being the occasional removal of mineral deposit and paper from the catch-pit; there are no chemicals required; there is *no sludge*; and no perceptible fatigue has been found in the beds in four years.

As far as it is possible to judge from present experience, the beds may reasonably be expected to last for ten years; should they fail then, or even sooner, the cost of removing the material, washing and replacing it, is small when spread over the life of the beds.

As regards comparative cost, it may be taken that the land required is equal in both systems. The catch-pit for mineral deposit, the screen for removing paper, and the tanks are also necessary in both; leaving the cost of filling material in the biological system to set against sludge—pressing and removal, chemicals, and their application to the sewage.

At Sutton, the average working cost per million gallons treated by chemicals and broad irrigation, is £15 11s. 11d., as against £3 19s. 0d. by biological treatment; if interest on first cost be added to the latter, at the rate given for Manchester, namely, £1 11s. 7d., a balance of £10 1s. 4d. per million gallons still remains in favour of biological treatment.

The author states (presumably referring to the Adney system) that "the cost of purchasing and applying a suitable oxygen carrying compound would not amount to more than one-third of this sum," *i.e.*, £1 11s. 7d., divided by three, or, say, 10s. 6d. per million gallons!

If this system produces an effluent, that will be allowed to flow into the Thames or its tributaries, above the intake of the water companies. At a cost, including capital charges and maintenance, of 10s. 6d. per million gallons of sewage treated, we hope that Mr. Parry will make public in your columns some further particulars, for the benefit of those engaged in the solution of what may fairly be called the problem of the present.—Yours faithfully,

HENRY OUGH and SON,
A.M.I.C.E., A.R.I.B.A.

ALTERATION WORK.

To the Editor of The Builders' Journal.

London, W.C.

Sir,—I think the larger number of members of our profession will hardly agree with A. H.'s reply to the query of E. S. E. (Blackpool), published in your issue for December 27th, 1899. If the contractor has worked correctly to the architect's drawings, and the pilasters in execution appear comparatively insignificant, the client could in no way expect a concession in price, either from the builder or the architect, as it is quite a question of design and opinion, and as such is a matter entirely within the province of the architect to decide, more especially, as I take it, that the client has seen and approved of the drawings at or previous to the signing of the contract.—Yours faithfully,

C. ORLANDO [illegible]AW.

To the Editor of The Builders' Journal.

London, W.C.

Sir,—With reference to the above letter, the expression "comparatively insignificant" does not convey the point involved in E. S. E.'s question, which stated that the pilasters appeared insignificant, "compared with those adjoining." In our answer we replied that if the contractor worked to the drawings he was in no way responsible, and in this our correspondent agrees. We differ from him in thinking that the architect would not be responsible. The reason he gives is that it was a question of design and opinion, and entirely within the province of the architect to decide, adding, "more especially, as I take it, that the client has seen and approved of the drawings at or previous to the signing of the contract." This latter fact, if it be one, is not stated in the question, on which alone our opinion was asked and given. No doubt the matter was one of design and opinion, and entirely within the province of the architect; but if his design was so faulty that when it was carried out the result was so unsatisfactory that the work had to be done over again in a different way, does our correspondent really consider that the architect incurs no responsibility for having made so defective a design? Surely he ought to have known that the pilasters which he designed would, when executed, look insignificant compared with those adjoining. If he did not, he must either have failed when making his design to take account of the surroundings, and thus been guilty of grave neglect, or he must have been unable to foresee the effect of his design when carried out, and thus exhibited a serious want of skill. If he did know that the pilasters which he designed would, when executed, appear insignificant compared with those adjoining, does our correspondent think he ought to have so designed them? If so, we fear he has an erroneous conception of what a trader is entitled to expect from an architect whom he employs to design a new shop front. Certainly the last thing he either expects, or is entitled to expect, is that his new shop front is to look unnecessarily mean or insignificant beside his neighbour's on either side. It is the architect's business to bear this in mind, and reconcile it with the requirements of art. If he fails to do so the client has just right to complain. We do not think that even if the client saw and approved of the drawings it would make much difference. He could not be expected to foresee what the effect would be when finished. He had not the skill to translate, so to speak, the language of the design into the expression of the completed work, and while he approved of the design on paper, he was not necessarily estopped from disapproving of it when reproduced in stone or wood.

This discussion, however, is probably altogether beside the actual facts of the case. The question says:—"Contractor does not give sufficient projection in head, but *otherwise* works to drawings." It would appear, therefore, that according to the drawings the proper amount of projection was given, and that the contractor failed to give the proper amount of projection, because he neglected to work to the drawings. We have in our answer dealt with this alternative, and we adhere to our answer in this and in every other particular.

Yours faithfully, A. H.

LAST YEAR'S ART.

THE past year has shown a sudden and quite unexpected improvement in the general demand for artistic productions. At the Academy, where for some time past the record of sales had been steadily dropping until in 1898 it reached the insignificant total of £13,730, a marked advance was noted, and sales to the amount of £21,670 were announced. Other exhibitions, too, enjoyed a spell of acceptable prosperity and artists generally found the conditions of their profession distinctly more favourable. It was significant, however, that with very few exceptions the works sold were those comparatively low in price and that collectors showed no eagerness to become possessed of large and ambitious productions. At the same time, there has been no diminution in the willingness of picture buyers to pay heavily for the works of deceased masters; pictures by famous painters have sold readily, and have been keenly competed for.

The special exhibitions of the year have been numerous and important. The beginning of the year witnessed a veritable boom in Rembrandt. The collection of 208 of the master's pictures at Burlington House was closely followed by the display of his etchings at the British Museum. These were in every way two memorable events. Scarcely less so was the New Gallery Exhibition of Burne-Jones's pictures, in January. Every work of any note by the great English romanticist was included save the remarkable "Briar Rose" series, which could not conveniently be removed from the architectural setting for which it had been designed. In the spring Turner and a few of his contemporaries were adequately represented at the Guildhall; and at the Grafton Gallery a living painter who has made a reputation all over the world, M. Verestchagin, claimed attention. Abroad the most important shows were the Van Dyck Exhibition at Antwerp and the Velasquez Exhibition at Madrid.

Two events that will have in the future a marked effect upon the art progress of the country took place during the past twelvemonth. One was the final decision of the Government to proceed with the completion of the South Kensington Museum, and the laying, in May, of the foundation stone of the new buildings by the Queen. The other was the opening of the new rooms which two years before the late Sir Henry Tate had undertaken to build so as to make perfect his gift of the building at Millbank which is officially styled the National Gallery of British Art. Some years must elapse before the extension of the Victoria and Albert Museum, as the South Kensington Museum is henceforth to be called, is available, but the year 1899 will be memorable as having seen the commencement of an undertaking most necessary and yet inexcusably delayed.

Decorative art showed, to the encouragement of all concerned in its welfare, increased signs of vitality. The exhibition of American and French Applied Art at the Grafton Galleries in the summer served to introduce Mr. Louis Tiffany to his brethren on this side of the Atlantic. The Arts and Crafts Exhibition at the New Gallery, which came later, has by now passed into the company of hardy periodal shows that London brings forth. Together these exhibitions served to show the widespread renaissance in decorative design, and the mutual ties which bind the craftsmen of this country to America and to the Continent. One cannot avoid the conclusion, though it savours of insular partiality, that our designers are superior to their foreign contemporaries, and owe less to them than they give. The reflection of English ideas in Continental designs illustrates this fact. Round the St. Paul's Cathedral decorations a fierce controversy raged a few months ago. It led to a few minor alterations in the work in progress, but caused no radical change in the policy of the Decoration Committee. In all main essentials the decorative principle adopted at the outset by Sir W. B. Richmond remains unaffected, and his designs for the mosaics are being consistently carried out.

The Royal Academy has made several additions to its roll of members. Four new Associates were elected during the year: Mr. Alfred East, a landscape painter; Mr. A. S. Cope, a portrait painter; Mr. Goscombe John, a sculptor; and Mr. Aston Webb, the well known architect. An Honorary Foreign Academician was also added, M. Jules Breton. A serious loss, however, was sustained by the Academy in the death of two Associates, Sir Arthur Blomfield and Mr. Harry Bates. Several other deaths among artists have occurred, though happily the English school has suffered less than in recent years. Two men and one woman of European reputation have fallen out of the ranks of art—James Maris, Giovanni Segantini and Rosa Bonheur.

Professional Practice.

Acton.—The new Passmore Edwards library which has been erected from designs by Mr. Maurice B. Adams was opened last week by the American Ambassador (the Hon. Joseph H. Choate). The building is a rendering in red brick and stone of the English Renaissance, with large mullioned windows and pedimental projecting pavilions, emphasising the façade rising above them, with a gable having for its prominent feature a boldly-detailed circular window. All the public departments, including the book reading room, 50ft. by 30ft.; the lending library, 45ft. by 38ft., having a counter over 30ft. long, with bookstall, gallery and librarian's office; the book store; magazine room, 25ft. 9in. by 21ft.; and the reference room, about 28ft. by 24ft., are situated on the ground floor, and open out of a central hall. The first floor is utilised as the librarian's residence, comprising drawing-room, three bedrooms, kitchen and offices, with a house-yard in the basement, and cellar. The roof is covered in green slates and a wrought-iron finial rises above the canted bay of the magazine room. Sculptured figures flank the entrance and support the corbels which carry the columns above. These, and the carving on the exterior, were executed by Mr. Nathaniel Hitch. The wrought-iron fence and gates, which together form a conspicuous ornament round the library, were carried out from the architect's drawings by Messrs. Hart, Son, Peard and Co., whilst the oak fittings and furniture were made by Messrs. W. Johnson and Co., Wandsworth. Mr. Marcus Smith, Churchfield Road, Acton, supplied the gas fittings after the architect's details; the wiring for electric lighting has been carried out by Mr. George Cockburn, of Ealing, and the quarry glazing by Messrs. Aldam, Heaton and Co., of Bloomsbury. The builder is Mr. Sidney Powell, of Bedford Park. The cost has been £6,610, towards which Mr. Passmore Edwards contributed £4,000. There are at present nearly 10,000 books in the library, which, however, provides accommodation for double that number. The lending department comprises about 7,000 books, including a juvenile library of 900 volumes, and, in addition, a collection of musical works. The reference library contains about 3,000 volumes.

Burton-on-Trent.—The Burton-on-Trent Artisans' Dwellings Company, Ltd., are busy erecting houses on their estate at Horninglow, to fulfil the want of suitable dwellings for the working population of Burton-on-Trent. Sixty of these houses will shortly be ready for occupation. The accommodation consists of a living room 12ft. by 12ft., having a wooden floor and cooking range; a kitchen 11ft. by 9ft. 3in., with tile floor, copper, fireplace and sink, and a pantry leading therefrom; two bedrooms are provided, one 15ft. 6in. by 12ft., the other 11ft. by 9ft. 3in., each being properly ventilated and containing a fireplace. Complete privacy is secured for each tenant by a separate passage entrance for each pair of houses, the back yards being subdivided by brick division walls. The out-offices comprise w.c., coal-house and ashes-place. South Staffordshire water is laid on to each house, and the drainage system is well ventilated and disconnected from the main sewer. A garden 50ft. to 63ft. long is provided for each tenant. There are also in course of erection other houses having five rooms of somewhat larger proportions, the fifth room being an extra bedroom. Up to the present, estimates for 133 houses have been accepted, the contractor being Mr. Henry Edwards, of Blackpool Street. The architect for the work is Mr. Thomas Jenkins, of 35, High Street.

London.—Next to the "Palace of Henry the Eighth and Cardinal Wolsey," at the top of Fleet Street, a new bank has been built for Messrs. Barclay, Bevan and Co. The site was formerly occupied by Messrs. Gosling and Sharpe's bank premises, which were very old and covered the ground previously occupied by the Golden Dragon, the Crown, the Wheatsheaf, the Three Daggers, and Gun-in-Hand Alley. The sign which hung over the inner door of the old building is being carefully preserved in the new premises, which have been built of Portland stone in the Italian Renaissance style. Every modern convenience has been provided, and electric light has been installed throughout. The structure has been erected, at a cost of £25,000, from the designs and under the superintendence of Mr. Arthur C. Blomfield, M.A., the son of the late Sir Arthur Blomfield, A.R.A. The latter held for many years the post of architect to the Bank of England, and Mr. Blomfield has now suceeded him in that appointment.

A new block of buildings comprising four shops and nearly seventy offices has been built on the west side of Chancery Lane. It covers an area of 6,000ft. super. and is in the Tudor style, the façade being of Portland and Beer stones. Fireproof construction has been observed throughout, and much care has been bestowed on the lighting arrangements and the ventilation. The architects were Messrs. Waterman and Lewis, of 7, Cullum Street, Fenchurch Street, and the contractors were Messrs. Dolman and Co., of Poplar, E.

On January 4th the new St. George's Hall and schools which have just been built in the Old Kent Road, Southwark, by the South-East London Mission, were formally opened. The new hall, which is the outcome of about twenty-five years' missionary effort in one of the most densely-populated districts of the metropolis, has cost altogether considerably over £12,000. Of this sum about £11,000 has already been subscribed, the City Corporation having for the first time in the history of Primitive Methodism contributed 100 guineas. In order to raise the greater portion of the amount, however, the Rev. J. Flanagan, the minister in charge, has, during the past two years, travelled over 35,000 miles, conducted fifty-six special missions, and preached and lectured over 700 times. The late Professor Banister Fletcher was the architect of the building, the chapel of which seats over 800 persons, there being in addition five minor halls

Keystones.

The Central Hall of Varieties, North Shields, was destroyed by fire last week.

Pymme's Park is the latest suburban park. The Edmonton District Council acquired it for £36,000.

A new Town Hall at Tunbridge Wells is a scheme now receiving the consideration of the local authorities.

The Ancient Southern Wall of Chulmleigh Parish Church has been taken down and restored, as the foundations were found to be faulty.

Mr. G. L. Watson, D.L., J.P., of Rockingham Castle, Northamptonshire, died last week. He was an authority on Norman Architecture.

In the new Public Hall at Halifax, now approaching completion, an organ is to be erected at the expense of Miss Elizabeth Porter. The cost is £2,400.

Keighley Hospital is to have an additional pavilion for scarlet fever cases. Messrs. John Judson and Moore, the former architects, will be consulted about the work.

A Technical Institute and Public Hall at Colne is to be built in Albert Road at a cost of about £9,400. This sum is about £600 under the original estimate.

Woodcock Street Baths, Birmingham, are to be extended by the addition of a first-class swimming bath and private baths for men, at an estimated cost of £9,000.

New Market Hall, Leeds.—At their last meeting the Leeds City Council authorised the Markets Committee to proceed with this building, which is estimated to cost £80,000.

Wesleyan Church Building in London.—£100,000 has been expended during the past year on new Wesleyan churches in London, and £40,000 on mission premises. Thirty other churches are contemplated to be built.

A new Infirmary at Liskeard Workhouse has been built from the designs of Mr. Sansom, architect, by Messrs. Hobbs and Bartlett, contractors, of Linkinhorne. The cost, including furnishing, has been about £5,500.

Hexham Abbey Restoration. — Mr. Thomas Spencer, of the Newburn-on-Tyne steelworks, has promised to build the nave of the church at a cost of £15,000, and Mr. James Hall, of Dilston Castle, has promised to rebuild the old Lady Chapel at a cost of £10,000.

New Baths for Accrington.—The Baths and Library Committee of the Accrington Corporation have instructed the surveyor to prepare plans and estimate for the erection of baths, with stone front, adjoining the Salvation Army Barracks in St. James's Street, the swimming bath to be 70ft. long by about 30ft. wide.

A Tax on Hoardings.—The Works Committee of the Dundee Town Council has decided to levy charges on hoardings in public streets at the rate of from 4d. in the suburban to 1s. 6d. per superficial yard per month in the central district. It has also been agreed that no hoarding shall be used as an advertising medium except under special conditions.

Aberdeen Town Council.—At the Council meeting on January 3rd, it was resolved to obtain an additional 700 horse-power engine and dynamo for the electricity works, at an estimated cost of £6,325. The Workmen's Dwellings Committee reported that they had fixed the commission to be allowed to the architects in connection with the additional houses be erected under the Workmen's Dwellings Act at 3½ per cent. on the amount of the contracts accepted, with a further commission of 1½ per cent. being allowed for the preparation of the schedules of quantities. Plans for new workshops at the police stables, Poynernook Road, were approved, and it was remitted to the Cleansing Committee with powers to have the work carried out, at an estimated cost of £3,612.

Mr. Kidson Swales, a member of the firm of Messrs. Frederick Jackson and Co., decorators, Leeds, was buried on Friday last.

A French Poster Competition.—It is reported that the municipality of Paris is considering a proposal to offer prizes for wall posters.

Mr. Mortimer Menpes is leaving England immediately for South Africa, where he intends painting a series of pictures of incidents connected with the war.

St. Matthew's Church, Buckley, Flintshire.—For building a chancel to this church, in memory of the late Mr. Gladstone, Miss Helen Gladstone and Mrs. Drew have intimated their intention to give £1,000.

Gifts to Assuan Church.—The Queen has signified her intention to present a font to the new church at Assuan, Upper Egypt, which is to be consecrated on January 28th. A marble floor for the chancel and a lectern have also been promised.

Mr. Thomas Collins, J.P., who was five times mayor of Tewkesbury, died last week. He was widely known on account of his connection with the restoration of Tewkesbury Abbey, which was greatly improved by his generosity. The deceased, who was in his eighty-second year, was head of the firm of Collins and Godfrey, builders, Tewkesbury and Cheltenham.

The Art School at Bushey, which is carried on under the active supervision of Professor Hubert Herkomer, R.A., has recently amended its constitution, with the view of establishing itself on a more permanent basis, and has obtained powers to largely increase the number of its members. These amendments came into force on January 1st, when the new term commenced.

Cartwright Memorial Hall, Bradford.—We understand that tenders for the erection of the Cartwright Memorial Hall in Lister Park, Bradford, are about to be invited. Since the plans were accepted they have been in the hands of the quantity surveyors, who have now completed their part of the work. It is not likely that any further delays will occur to prevent the actual starting of building operations in the early part of the Spring.

New London Park.—On Wednesday last the Ilford District Council decided to spend £11,000 for laying out a new park at the Green Lane end of the district. This makes the fourth park the Council have decided on during the past year, but inasmuch as the growth of the district has been enormous, the Council think they are justified in their action. During the last ten years the assessable value of Ilford property has increased from £60,000 to £200,000.

Art Gallery for Bristol.—Sir William Henry Wills has offered to double the offer he made last summer of £10,000 towards the establishment of a municipal art gallery for Bristol, provided that the Corporation supplies the balance of £10,000 to make up the total expenditure—£30,000. A committee has been appointed to consider the best means for carrying out the proposal. The site of the Gallery would be that at present occupied by the Salisbury Club buildings.

Municipal Fire Insurance.—The committee of the Glasgow Corporation appointed to report on a system of municipal fire insurance propose that a fire fund shall be established as provided for by the Act, and into it shall be paid all premiums received from departments for the property covered, and out of it shall be paid all losses arising from fire and damages resulting therefrom, fire brigade charges, expenses of management, and all other expenses incidental to the department. Also, that a reserve fund shall be established to the amount of £30,000. On the occurrence of a fire the loss and damage shall be fixed and determined by a valuer to be appointed by the Corporation. A table of the suggested departmental contributions to the reserve fund shows the amounts covered by companies to be £1,453,116, the premiums paid £2,771, departmental contributions to reserve fund £30,000, and reserve fund on hand £7,433.

The new Church of St. David, Exeter, is now completed.

A Yiddish Theatre is proposed to be erected in the East End of London.

Ornamental Shelters at Leeds are proposed to be erected, at a cost of £253 each, on the Bramley, Stanningley, Rodley, and Wortley recreation grounds.

The new Underground Reservoir on Park Hill, Pontefract, has been tested and found to be watertight. The work will be completed very shortly.

Hull Town Hall Scheme.—At the monthly meeting of the Hull City Council held on Wednesday last, the report of the Property Committee recommending the extension of the town hall at an estimated cost of £120,000 was adopted. Some particulars of this scheme were given on page 334 of last week's issue.

R.I.B.A.—At a business meeting of the Royal Institute of British Architects held on Monday evening last the following gentlemen were elected Fellows:—Mr. Herbert Baker, Cape Town; Mr. Frank Gatley Briggs, of Blackburn and Liverpool; Mr. John Murray, of London; and Mr. Harry Vernon Wolstenholme, of Blackburn and Liverpool.

Explosions due to Heated Electric Cables. — A somewhat strange explosion occurred in Manchester on Friday last near the Royal Exchange due to a breakdown of an electricity main owing to a crowbar being driven into another main near. This created gases from the heated rubber which exploded. The city officials have lately been removing old underground rubber-covered cables, which are liable under some conditions to overheating, and it is expected that the new cables now being laid will be entirely free from danger.

Art Bequests to Liverpool.—The will of the late Mr. H. F. Hornby, of Liverpool, has been proved at nearly £159,320. He directed that his executors should in due time offer to the city authorities his art library and collection of engravings, autographs, etc., on condition that they shall be kept as a separate collection for the use and benefit of the art-loving public of Liverpool. In the event of the Corporation agreeing to this, he further bequeathed to the city a sum of £10,000 towards the cost of a building in which the collection could be housed.

Furness Abbey: A Discovery. — On Friday last the excavations in progress at Furness Abbey disclosed some important and interesting facts regarding the early settlement of Cistercian monks in Furness. Below the present sacristy, on the east side of the north transept, there were found the walls of an early Norman apsidal chapel, the first building erected by the Cistercian monks in Furness. Adjoining and east of the foundation was a solid mass of human bones 3ft. thick. The bones have lain in the present site for over 400 years, but are well preserved.

A Remarkable Discovery has been made by Dr. Peters, who has recently been excavatting at Nippur, an ancient city of Babylonia. While the workmen were clearing away the *débris* from the walls of the temple of Bel, they discovered in a hole which had been closed up with sun-dried bricks a large goose egg on a mat of reeds. Why the egg was placed there is a mystery, as it has no connection with any known Babylonian custom. The temple was built at a very remote time, probably in the reign of Akur-gal (B.C. 2,200) or even earlier, so that the egg is over 4,000 years old.

A Lesson to Jerry-Builders.—Exemplary punishment for jerry-building has been meted out by one of the parish correctional courts at Paris. A house in the Rue des Appenines collapsed some time ago during construction, killing eight workmen and injuring nine others. An inquiry showed that the disaster was due to the erection of the premises being faulty, and that inferior materials were used. The architect and masonry contractor have each been sentenced to eight months' imprisonment, and two ironworks contractors to two months' imprisonment each, and all four have, in addition, been ordered to pay damages to the relatives of the men who were killed.

A Wagner Theatre for Berlin is proposed to be built.

The Restoration of York Minster is to be proceeded with.

New Board Schools at Neath have been built at a cost of £10,700 from designs by Mr. J. Cook Rees. Mr. David Jenkins, of Swansea, was the contractor.

Manchester Housing.—At their meeting on Wednesday last, the Manchester City Council decided to purchase 237 acres of land at Blackley on which to erect workmen's cottages.

Bridge over the Tugela.—The Patent Shaft and Axletree Company have succeeded, after keen competition with American firms, in securing a Government order to send out immediately a new bridge to cross the Tugela at Colenso, evidently to replace the old one, which has now been finally destroyed by the naval guns. Seven spans are required, and, needless to say, the work has to be carried out with the utmost despatch.

New Patents.

These patents are open to opposition until February 13th.

1898.—Driving Gear.—26,600. J. SMITH and G. SCRUTON; both of London. In endless block tackle, pulleys are employed which have a half-round groove in the centre of their edge, in which are half-sunk holes at suitable intervals. The chain consists of a wire rope on which metal balls are fixed at corresponding distances apart. The balls may be fixed on by placing the rope in a chilled bullet mould and pouring in the metal.

Wood-working Machines.—27,049. T. SHURMER, Bolton. At the bottom of a vertical spindle driven by a belt is a rotary cutter; the vertical movement of the spindle can be controlled by means of a weighted lever. Below the cutter is a double table. The bottom portion may be fixed by a clamp or may be rotated by hand or power, and the upper part slides across the face. To this upper table the work is secured, and it will be understood that considerable range is obtainable by this arrangement. Different cutters are attached for different kinds of work. The machine can also be used for shaping metal.

1899.—Examining Tram Rails, &c. 2,714. F. J. EDGE and W. MANGNALL; both of Manchester. This is an apparatus for testing tram rails or other surfaces to see how they are wearing. It consists of a rectangular frame supported by feet which may be swivelled out of position when not required. This frame is filled with thin slides, which extend in a row from one side to the other, run in grooves, and are prevented from falling out by wires. The instrument is placed on the rail (the feet supporting the frame clear) and the slides naturally fall and indicate by their upper ends the shape of what is below. They can now be clamped in this position and a tracing taken from the contour which they present.

Electric Floats: Footlights.—2,742. E. W. BOWLES, London. Immediately behind the facia of the stage are secured angle irons which have, at their inner ends, hinged cover pieces. The reflector consists of bent sections secured to the angle pieces by thumb-screws, and being pierced with holes for the electric lamps or gas jets. The lampholders and connections are below. When the lights are on, the hinged cover pieces (which may be white enamelled on the underside) are lifted back and lie flat on the stage. When the lights are out, the covers are put back. By these means it is claimed that the reflector can be easily removed for cleaning, dust is kept out, the lamps are protected, and no light is lost in the socket.

Varnish Manufacture.—2,848. A. J. SMITH, London, S.E. A mixture of purified linseed or similar oil and gum, such as cowrie or copal, is heated to about 300deg. Fahr. in a closed vessel provided with a safety valve and pressure gauge. The heat and pressure are maintained for several hours, and the contents are then allowed to cool, the necessary quantity of turpentine and driers being added in due course. As the vessel is closed, there is no escape of vapour, causing loss or nuisance.

Sink, Bath, and other Discharge Valves.—3,066. J. SHANKS, Barrhead, N.B. The plug is disc-shaped, has a rubber rim, and is connected by a chain with the hinged, perforated cover of the overflow. This latter extends down the back of the sink or bath and empties into the outlet just below the plug. The overflow is integral with the body. A modification is included in the invention.

Plugs or Wedges for securing Flashings.—3,210. Mr. J. CURTIN, Victoria, Australia. The wedge consists of a piece of metal bent up to form an incomplete tapering tube, provided with a point at one end and a rounded head to receive the blows by which it is driven in between the joints. The wedge holds the flashing tightly beneath it, and may be filled in afterwards with cement or mortar.

Locks and Latches.—3,350. F. W. LOCKLEY, King's Norton, Worcs. In an upright lock a spring bears against the latch bolt, and below this is a guide (which slides up and down) carrying the follower, a spring being provided at the bottom. As the door is closed the latch is pushed back and slides on the top of the follower. When it is closed, however, the follower slips into a notch or recess in the latch bolt, and is held there by the bottom spring and guide until the lock handle is operated. Above the latch is a lock. The advantage claimed is, that the arrangement allows very narrow locks to be made, suitable for doors having narrow stiles.

Fireplaces.—19,658. R. W. BOYD, London, W. A hot closet or oven of iron or other metal is provided above the fuel, at the top of the fireplace, and is heated by the fire, or, when there is no fire, by a spirit lamp supported on a movable bracket. Plates, food, &c., can be kept in this oven.

Fire Extinguishing Appliances.—20,099. F. B. POWERS, Chicopee Falls, U.S.A. The hose is wound on a reel that works on a spiral stem of the water valve extension. On one side it has projecting lugs. When required, the hose is taken hold of and dragged to the fire outbreak, and, as it is unwound, the reel turns and travels on the screw towards the water valve until its lugs come in contact with the projections on a wheel, which opens the valve and lets in the water. There is thus no waste of time in obtaining a water supply. The whole apparatus is connected up and is supported on the wall.

The following specifications were published on Saturday last, and are open to opposition until February 20th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—26,558, MONTGOMERY-MOORE and PRESTON, apparatus for closing and opening bulkhead and other doors. 26,628, GOODWIN, acetylene generating apparatus. 26,713, WATSON, DURELL and MILLER, water-closet valves. 26,902, PARYCZKO and LITYNSKI, device for heating the contents of baths.

1899.—630, EDWARDS, pumps. 754, JACKSON and WITHINGTON, door fastenings. 982, GORRINGE, stoppering varnish, oil, paint cans and the like. 1,184, HITCHCOX, dust cover and shoot suitable for a cart or waggon to avoid dissemination in the removal of house and other refuse. 2,139, SQUIRE and SQUIRE, swing joint or movement for mirrors, windows, ventilators, &c. 2,411, BINNY, water distiller, feed water purifier, and make-up apparatus for hot water and steam supply and warming installations. 2,413, BINNY, swing radiators. 2,434, J. DUCKETT and SON, LTD, and DUCKETT, gulleys or traps for downspouts. 2,757, RESTALL, apparatus for jointing and repairing drain and other pipes. 2,930, MAY, means for consuming smoke. 3,096, CROMPTON and CHAMBERS, collapsible core bars for use in casting metal pipes, columns, cylinders, &c. 3,099, FISHER, heads of Venetian blinds. 3,219, SUCCIE, blind fixtures. 3,333, TATTERSALL, ventilating fans. 3,337, PURDY and HINDLEY and Co., LTD., road paving. 3,460, MORRIS, apparatus for cutting tiles and the like. 3,522, FREEMAN and OLD, attachment of sash and analogous lines to window and other frames. 3,903, PILKINGTON, machinery for rolling sheets of glass. 3,970, DETSINYI, method of heating and process of manufacturing a suitable preparation therefore. 4,054 BOULT (*de Lasserve*), acetylene gas generators. 5,408 GREEN, chimney tops for preventing down draught. 13,674, DE SCHODT, apparatus for use in incandescent gas lighting and heating. 13,911, STEVENSEN, combination latch and alarm lock. 14,816, BAYLEY, acetylene lamps. 14,948 SHAW, gas lamps and lanterns. 17,457, STURGIS, window blinds. 17,830, FAIRBAIRN, green-houses. 18,241, CERVENKA, incandescent gas lamps and burners. 18,262, FÖRSTER, method of and apparatus for the casting of tubes, pipes, and other articles of regular form and of considerable length. 18,381, MILLS (*A. B. Dick Company*), duplicating apparatus. 18,787, OWEN, manufacture of artificial stone. 18,945, GRUENDLER, tiled boards or blocks for floors, ceilings, frames and the like. 19,769, VON DE WEHL, fastening device. 20,255, GRISMER stage appliances. 20,423, MURINICK, incandescence gas burner. 20,930, DE BRUYN, artificial building stone. 21,401, SCHMIDT, joiners' clamps. 21,963, FINK, building blocks applicable for cavity walls. 22,415, STERKEL, brushes. 22,467, COHEN, manufacture and decoration of mouldings for picture frames 22,514, MURPHY, means for locking nuts. 22,626 EVANS (*Hopkins*), breakwaters, river bank facings, or protections, &c. 22,671, ADAMS, seat action closets. 22,678, STARK, nut locks. 22,722, KESSEL, gas stoves. 22,884, KEMNITZ, construction of ceilings and walls for buildings and other structures. 22,890, BARTH, collapsible or folding ladders.

New Companies.

Halton's Wood Brick Company, Limited.

This company was registered on December 22nd by Ashwell and Co., 79, Queen Street, E.C., with a capital of £5,000 in £1 shares, to acquire certain land forming part of Trafford Park, Davyhulme, near Manchester, and to carry on the business of brick, tile, pipe, pottery, earthenware, terra-cotta and ceramic ware manufacturers, &c. Registered without articles of association.

Forthgain Quarries, Limited.

This company was registered on December 23rd, by Drake, Driver and Leaver, Limited, Rosebery Avenue, E.C., with a capital of £25,000 in £1 shares, to search for quarry, work, make marketable and deal in stone, lime, cement, &c. The first directors (to number not less than two nor more than five) are to be appointed by the subscribers. Qualification, £200. Remuneration as fixed by the company.

Church Stretton Building Co., Ltd.

This company was registered on December 30th by Goddard and Aldridge, 6, Old Serjeants' Inn, E.C., with a capital of £20,000 in 1,960 £10 ordinary shares and 400 £1 deferred shares, to acquire houses and property in Salop, and to carry on the business of builders, timber merchants, sawyers, woodworkers, &c. The first directors (to number not less than three nor more than seven) are G. H. Dorrell (chairman), Hon. G. E. Hill-Trevor, T. F. Kynnersley and Robert H. Pitcairn. Qualification, £100 ordinary and £5 deferred shares. Remuneration, one guinea each per board meeting attended (12 guineas for the chairman). Registered office: 18, Adam Street, Adelphi.

The death is announced of Mr. Alfred J. Baker, of the firm of Baker and Sons, auctioneers, of 11, Queen Victoria Street, E.C. He was one of the pioneers of the system of building-plot sales.

COMING EVENTS.

Wednesday, January 10.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Paper by representative of Glasgow Architectural Association. 8 p.m.

SANITARY INSTITUTE.—Council Meeting at 5 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION. — Council Meeting at 7 p.m., and Students' Evening.

Thursday, January 11.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: The Upper Limb."

SOCIETY OF ANTIQUARIES OF LONDON.—Ballot for election of fellows. 8.30 p.m.

Friday, January 12.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. E. Guy Dawber, A.R.I.B.A., on "The Cotswold Country." 6.45 p.m.

INSTITUTION OF CIVIL ENGINEERS. (Students' Meeting).—Professor T. Claxton Fidler, M.I.C.E , on "The Theory of Structures and Strength of Materials." 8 p.m.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. H. F. Bladen on "Structural Work in Theatre Auditoriums." 8 p.m.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Lewis F. Day on "Ornamental Design.—II." 11.30 a.m.

ARCHITECTURAL ASSOCIATION.—Mr. Arthur Bolton on "The Dome as the Basis of an Architectural System." 7.30 p.m.

Saturday, January 13.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE AND ART.—Visit to Perth. 12.45 p.m.

Monday, January 15.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

Tuesday, January 16.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Annual Exhibition of Drawings at Alpine Club, Savile Row. Open till January 27th.

Wednesday, January 17.

SURVEYORS' INSTITUTION.—Students' Preliminary Examination—First Day.

BIRMINGHAM AND DISTRICT CLERK OF WORKS AND BUILDERS' FOREMAN'S ASSOCIATION. — Mr. H. Price, A.R.I.B.A., on "House Drainage." 8 p.m.

SOCIETY OF ARTS.—Ordinary Meeting at 8 p.m.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.—Annual Meeting of the members at 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. Algernon Barker, B.A., on "Legal Topics of Interest to Architects and Surveyors." 7.30 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

Thursday, January 18.

SURVEYORS' INSTITUTION.—Students' Preliminary Examination—Final Day.

SOCIETY OF ARTS.—Meeting of Indian Section.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson. M.A., M.B., on "The Anatomy of the Human Form : The Upper Limb."

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Hydraulic Installations as Somers Town Goods Depôt, and Kentish Town Locomotive Sheds, of the Midland Railway, where a new American Goods-Engine will be inspected. 2 p.m.

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Do., Russian ...	per gal.	0	0	6 1/8	0	0	6¼
Pitch	per barrel	0	8	6		—	
Tallow, Town	per cwt.	1	6	0	1	9	0
Tar, Stockholm	per barrel	1	5	0	1	5	6
Turpentine	per cwt.	1	18	3		—	
Lead, white, ground, carbonate	per cwt.	1	3	0	1	4	0
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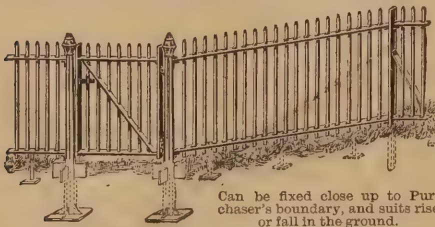
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	18	10	0	19	0	0
Do. pipe	do.	19	10	0		—	
Nails, cut clasp, 3in. to 6in.	do.	10	0	0	11	0	0
Do. floor brads	do.	9	15	0	10	15	0
Tin, Foreign	do.	111	10	0	112	0	0
Do. English ingots ...	do.	115	0	0		—	
Zinc, sheets, English ...	do.	27	10	0	28	10	0
Do. do. Veille Montaigne	do.	25	0	0		—	
Do. Spelter	do.	20	15	0	21	0	0



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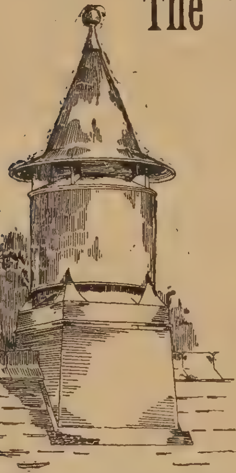

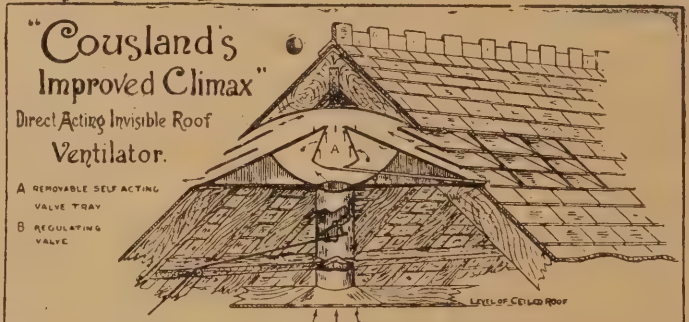

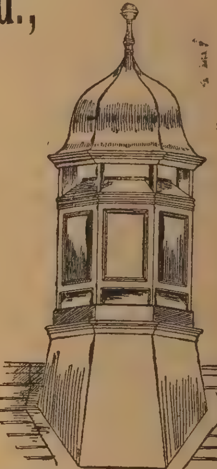

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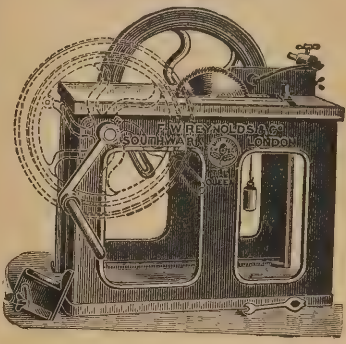

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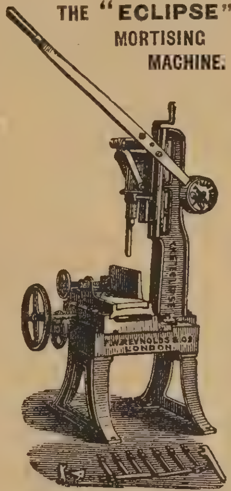

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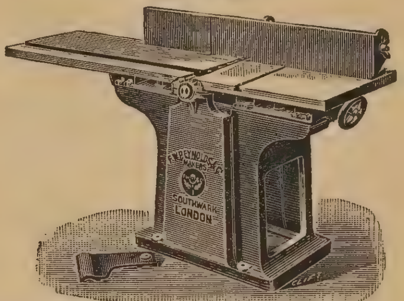

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Do. do. 2nd „	do.	10 10 0	12 0 0
Do. do. Unsorted „	do.	10 15 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	8 0 0	16 10 0
Do. White Sea	do.	17 10 0	18 0 0
Do. Quebec Pine, 1st...	do.	19 5 0	24 10 0
Do. do. 2nd	do.	16 10 0	—
Do. do. 3rd &c.	do.	9 5 0	9 15 0
Do. Canadian Spruce, 1st	per P. Std.	11 15 0	—
Do. do. 3rd & 2nd	do.	9 0 0	9 5 0
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Ash, Quebec...	per load	3 17 6	4 10 0
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Do. Tobasco	do.	0 0 4½	—
Elm, Quebec	per load	12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 1/8	—
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Do. St. Domingo ...	do.	0 0 3¾	—
Do. Tobasco ...	do.	0 0 6	0 0 7⅛
Do. Cuba ...	do.	0 0 7 29/32	—
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Do. Quebec	do.	4 12 6	5 0 0
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Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown...	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 9	0 3 5

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

ABINGDON.—For the erection of a hospital for the Joint Hospital Board. Mr. J. G. T. West, architect, Abingdon:—

Kingerlee and Son ...	£6,887	Walden and Cox	£5,821
Musselwhite and Son	6,298	Brasher and Sons ...	5,755
J. Grant	5,987	J. Buckle, Abingdon*	5,150

* Accepted.

BRIGHTLINGSEA (Essex).—For the supply and laying about 3,430 yards of water mains, for the Urban District Council. Mr. H. Goodyear, engineer, Colchester:—

W. Griffiths ...	£1,950 0 0	Lewellen and Co.	£1,540 19 11
Chandler and Sons	1,860 12 5	Manders, Leyton*	1,423 1 11
Stone Bros. ...	1,624 8 9	Blythe Bros. ...	1,411 15 0

* Accepted.

CROMER.—Accepted for alterations, &c., to east gangway, for the Urban District Council. Mr. A. F. Scott, surveyor, Church-street, Cromer:—

Cooke and Co., Westminster, S.W.... ... ... £577

Septic Tanks.

Cooke and Co., Westminster, S.W... ... £2,625

Auxiliary Sewer, Church-street.

Cooke and Co., Westminster, S.W... ... ... £265

CROYDON.—For rebuilding two shops, George-street, Croydon. Messrs. R. M. Chart and Son, architects, Croydon:—

Smith and Son ...	£1,987 0	E. Goulder	£1,890 0
E. J. Burnand... ...	1,910 0	H. Bacon...	1,789 10

CROYDON.—For laying about 12 miles 5 furlongs of pipe sewers with manholes, lampholes, ventilators and flushing tanks in the parishes of S nderstead and Coulsdon, for the Croydon Rural District Council. Messrs. R. M. Chart and Son, surveyors, Union Bank Chambers, Croydon. Quantities by Messrs. Franklin and Andrews, 25, Ludgate Hill, E.C.:—

	A	B	C	D
Free and Sons ..	£19,970	—	—	—
W. Langridge ...	19,970	—	£440	—
Ballard	15,847	—	449	—
G. Bell	13,661	—	334	—
G. Ossenton	—	£10,752	—	£4,324
J. and G. Binns ...	20,000	9,452	550	4,050
J. Adams	18,981	13,119	636	5,378
A. and A. Streeter	13,031	7,843	326	3,270
E. Iles	12,600*	8,121	320*	3,479

A Coulsdon, 1st portion C Sandestead, 1st portion.
B Do. 2nd „ D Do. 2nd „

* Accepted.

FARNBOROUGH.—For rebuilding the "Queen's Head" inn and stables, Greenstreet Green, Farnborough, Kent, for Messrs. Nalder and Collyer, Limited. Messrs. R. M. Chart and Son, architects, Croydon:—

J. Quittenton	£3,297	Somerford and Son ...	£2,748
W. Owen	2,980	Truett and Steel	2,644
Smith & Son, Bromley	2,930	Thos. Knight...	2,399
Smith & Son, Croydon	2,780		

LONDON.—For proposed alterations and additions to No. 59, Montague-square, W. Mr. Fred W. Foster, architect, 41, Bedford-row, W.C.:—

Simmonds	£2,678	A. Bush	£2,662
Whitehead and Co., Ltd.	2,675	Courtney and Fairbairn	2,495

LOWER GORNAL (near Sedgley).—For the extension of new girls' schools, Robert-street, Lower Gornal, for the Sedgley School Board. Mr. A. Ramsell, architect, Dudley:—

L. Jones	£3,370 0 0	Hilton and Caswell, Sedgley*	£2,966 14 3
Skett	3,090 0 0	Dorse and Co. ...	2,863 0 0
Case	3,070 0 0		
H. Gough	2,988 0 0		

*Accepted.

LOWER GORNAL (near Sedgley).—For the erection of new assembly hall, shops, dwelling house, stabling, &c., Red Hall-road, Lower Gornal, for the Dudley Co-operative Society, Limited. Mr. A. Ramsell, architect, Dudley:—

H. Gough	£2,630 0 0	Whittaker and Co.	£2,523 0 0
Jakehean and Round	2,555 6 8	W. Slatee, Upper Gornal*	2,325 10 0
Webb Bros. ...	2,550 0 0		

*Accepted.

MALVERN (Worcs.).—For the erection of new premises and shop, West Malvern. Mr. T. W. Holds, F.I.A.S., architect, 1, Promenade, Malvern:—

W. Hayes & Son	£1,985 10 0	W. James	£1,615 0 0
A. Holloway ...	1,733 12 3	J. Morgan	1,590 0 0
T. Broad	1,650 0 0	D. Smith *	1,229 0 0
A. G. Lewis ...	1,648 0 0		

* Accepted.

MERTON.—For the erection of a mineral water manufactory at Morden-road, Merton, for Messrs. H. Tomlin and Co. Messrs. R. M. Chart and Son, architects, Croydon. Quantities by the architects:—

Stewart and Sons ...	£2,530	Whitehead Bros.... ...	£2,225
E. Goulder	2,475	Parsons and Townsend	2,195
E. J. Burnand	2,445	J. Burges...	2,100

SOUTHEND-ON-SEA.—For the erection of the Nelson Hotel, North-road, for Mr. Joseph Berry. Messrs. Greenhalgh and Brockbank, architects, Bank-chambers, Southend-on-Sea:—

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Shelbourne and Co. ...	3,706	Whur...	3,190
Dupont	3,668	Davey and Son	3,147
Davis and Leaney ...	3,637		

WENDOVER.—For the erection of a convalescent home, Wendover, Bucks, for Miss Solomon, London. Mr. Guest Luckett, architect, Aylesbury:—

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WOODLAWN (Galway).—For the erection of house and out-offices, Tooreen, for Mr. C. O'Hara Trench. Mr. J. Smith, C.E., Ballinasloe:—

Thos. Egan	£1,600 0 0
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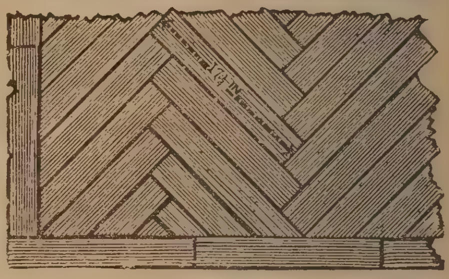

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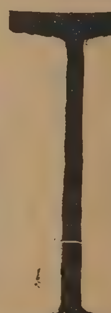

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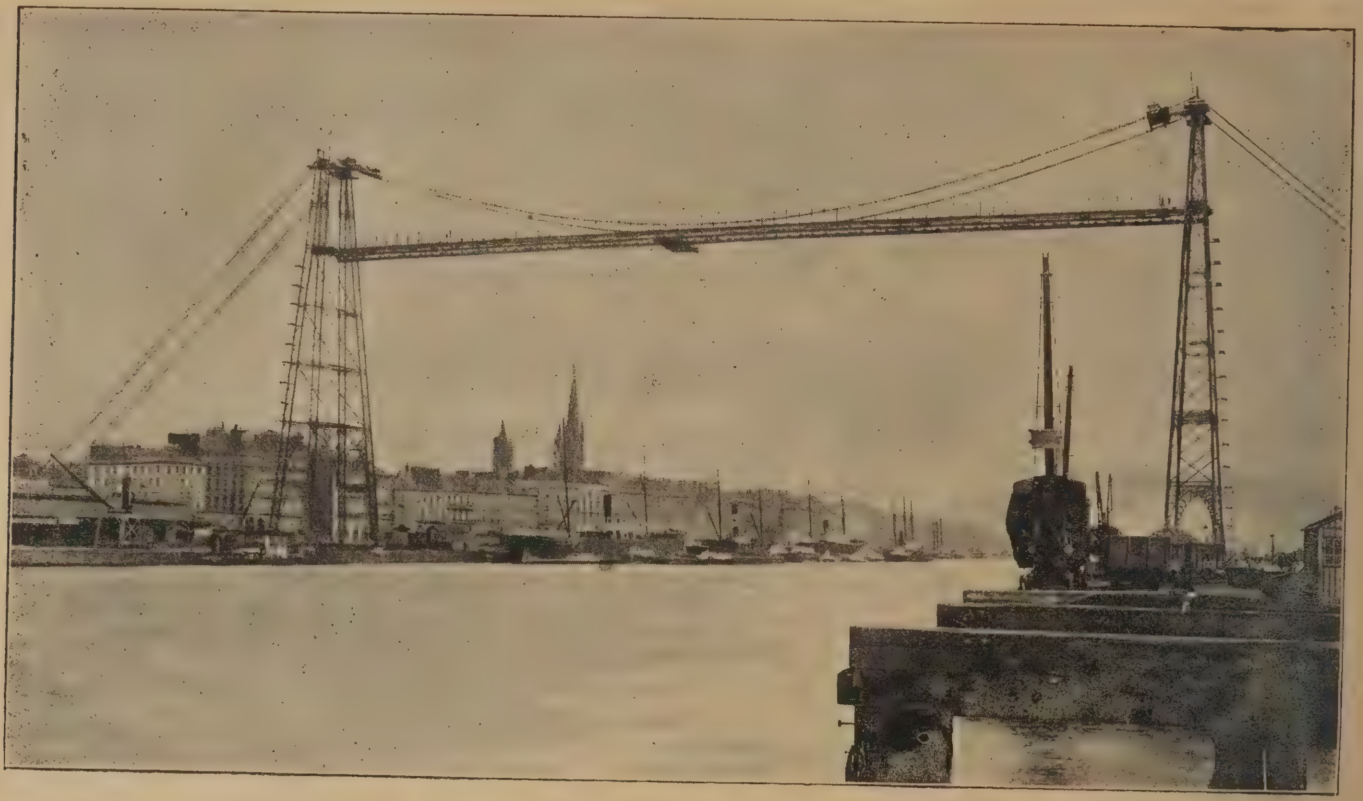


THE "TRANSBORDEUR" BRIDGE AT ROUEN.

CROSS-RIVER COMMUNICATION.

AN INGENIOUS SYSTEM.

On the eastern bank of the river Usk at Newport, Mon., there is a large tract of land which is about to be greatly developed by being divided by roads, provided with railways, and covered with buildings, and, in connection with the last, it may be stated that Messrs. John Lysaght, Ltd., the well-known firm of iron founders and engineers, have large works at present in course of construction on a portion of the area. In a comparatively few years, therefore, the east bank will have a large population. At present there is only one public means of crossing the Usk at Newport—the bridge near the Castle; but as this is a considerable distance from that part of the town which fringes the docks, it has become imperative to provide other means of crossing the river nearer its mouth.

With this object in view many schemes have been promulgated during the past thirty years—one was to erect a travelling carrier something like that at Brighton and Rottingdean; another was to have a steel arch carrying moving platforms on its haunches, the platforms being hauled over the arch by mechanical power; others were for a high level bridge (to be approached by a spiral roadway at each end), a bascule bridge like the Tower Bridge, a swing bridge, and a drawbridge with a central opening 200ft. wide. Finally, two schemes were left for consideration, a vehicular subway and a "transbordeur" bridge. When the cost of the former was ascertained (it worked out at £770,000) the proposal was hastily shelved, and the result is that the remaining one has been at last decided upon, and in the coming session of Parliament powers will be sought to enable the bridge to be erected—its cost is estimated at £65,000.

The "transbordeur" is the invention of a Frenchman named M. Arnodin, of Chateauneuf-sur-Loire, and possesses several peculiar features. Bridges of this description have been built at Bilbao, Rouen, and Bizerta (Tunis), and are in contemplation at Bordeaux, Nantes, Antwerp and Havre. At the present time there is no bridge of this kind in the United Kingdom. A general view of the Rouen bridge and an underview of the one at Bilbao are given as illustrations to this article.

The essential parts of this system are:—(*a*) A horizontal railway supported by a bridge spanning the channel or river to be crossed at such a height as will allow the tallest-masted vessels to pass underneath; (*b*) A car or frame mounted on rollers or wheels running on the railway previously mentioned, and so arranged that it may move freely in a longitudinal direction quite close to the bridge platform; (*c*) A carrier or platform of suitable dimensions suspended from the car or frame by steel rods or ropes, and hung at the level of the quays or banks, but above high-water mark. It will thus be seen that the bridge is nothing less than a gigantic travelling-crane.

The car or frame is arranged to run freely over the rails in both directions at pleasure, and, as the carrier or platform is suspended from it, the carrier can be hauled or drawn from end to end of the bridge or from side to side of the channel at the will of the person controlling its movement. The suspension rods carrying the platform are crossed or arranged in triangles so as to form an elementary kind of trussing, in order to prevent any swinging motion which might result from the pressure of the wind or from the longitudinal movement of the car or platform. The motive power may be obtained from cables driven by gas, steam or electricity. In the latter case it is preferable to place the motors on the movable car or frame. Whatever kind of power is employed it is essential that it should be under complete control, and capable of instantaneously reversing the motion of the car and working it in a backward or forward direction at will.

The use of electricity as a motive power dispenses with the necessity of employing men to drive a steam engine, and the working expenses are thus reduced to a minimum, as the conductor or attendant in charge of the suspended carrier can control its motion by means of suitable switch gear fixed on the platform itself. At Newport it is proposed to obtain the necessary electrical energy from the central supply.

The proposed structure consists of two steel towers on the eastern and western sides of the river, that on the west side being situate on portions of the Brithdir and Waterloo Wharves, a suspended girder spanning the river between the towers, and two anchorages. The towers are carried to a height of 250ft. above the river banks, and the suspended girder to a height of 170ft. above high-water mark, ordinary spring tides. The clear span between the centres of the saddles on the towers is 635ft. The suspension cables are carried a distance of 450ft. inshore to anchorages consisting of massive blocks of masonry, each about 40ft. square. The foundations of the towers are carried down to the marl underlying the alluvial deposit in the bed of the river by cylinders 20ft. in diameter filled with cement concrete, there being four cylinders to each tower or pier. A platform or deck 90ft. by 45ft. is formed at the base of each of the towers on the level of the river banks. The tower or pier on the west side projects 55ft. from the river bank. The wharves project 65ft. from the river bank. The tower or pier on the east side projects 70ft. into the river. The car will not project into the river, a special bay being provided in the bases of each tower to receive it while being loaded.

The carrier or travelling platform is 32$\frac{3}{4}$ft. long by 39$\frac{1}{8}$ft. wide, of which width two spaces of about 6$\frac{1}{2}$ft. on each side would be set apart for passengers, the remaining portion being available for vehicles. The weight of the car and its appliances would be about 39$\frac{1}{4}$ tons, and it would be capable of carrying as a constant load about 35 tons, or about 500 people of average weight. The test load would be about 19$\frac{1}{2}$ tons in addition, making a total rolling load of 94 tons. Under the influence of this load, coupled with the stress due to a wind pressure of 25lbs. to the superficial foot on all the exposed surfaces of the structure, and 12$\frac{1}{2}$lbs. on the portions at the back of those directly exposed, the stress set up in any part would not exceed one-fourth the ultimate resistance or breaking strain of the metal employed. This is within the limit allowed by the Board of Trade, 6$\frac{1}{2}$ tons per square inch for mild steel of good quality, though the wind pressure is less than that provided in the Board of Trade regulations for railway bridges. The allowances for wind pressure may, however, be modified in the final design for the "transbordeur."

The time occupied in crossing the river would be one minute.

The Rouen Bridge has a span of 467ft.

the height of the girder is 164ft., and of the towers 221ft., while there are twelve suspension cables. The car is 42ft. 6in. long and 36ft. wide, is suspended from thirty cables, and is driven by two 25-h.p. electric motors. It weighs 45 tons, and the load is 15 tons; but experimental loads of 100 tons have been carried across in safety. The car can be stopped and reversed in two seconds. The current is conveyed by an under-running trolley, not unlike that used on an electric car, and is carried through an insulated cable to a series parallel controller fixed in the pilot house on the car, and thence to the motors. The suspension cables and the bridge itself form the return circuit. The bases of the towers are electrically connected to the tram rails by copper cables, so as to form an efficient return. The bridge at Rouen was used to carry electric tram cars across the river, so that tramway passengers might cross from one side of the city to the other without changing their seats; but this practice has now been discontinued.

Besides the advantage of being able to convey vehicles across the river, a bridge erected on this principle affords a ready means of carrying workmen across at a quick rate; at Newport it is estimated that whereas they could be taken across in one minute on the "transbordeur," it would take them five or six minutes to walk through a subway. It might be mentioned that the River Usk at Newport varies from 400 yards to 150 yards. The width at the point of crossing is 240 yards.

In conclusion we must acknowledge our indebtedness to Mr. Robert H. Haynes, the borough engineer of Newport, through whose courtesy and kindness we have been able to give the above particulars and to publish the accompanying illustrations.

Workmen's Compensation in 1899.

DURING the past year the section in the Workmen's Compensation Act that applies to employment on, in, or about any building which exceeds 30ft. in height, &c., has given the Court of Appeal some trouble. The following points have been decided:—Where there is a roof, the height of the building is to be measured to the top of the roof, not to the top of the upright walls (*Hoddinot* v. *Newton*). The Act does not apply in the case of a building intended to exceed 30ft. in height that has not, at the time of the accident, reached that height (*Billings* v. *Holloway*). But the limitation as to 30ft. in height is to be read with the words which follow it in the section—"and is either being constructed or repaired by means of a scaffolding, or being demolished;" and consequently the Act applies to employment about a building on which machinery is being used for the purpose of construction, though the building is not 30ft. in height (*Miller* v. *Tompkinson*). The provision in the Act by which the accident to the workman must arise out of, and in the course of, his employment has been the subject of many decisions.

In *Holness* v. *Mackay* it was held by a majority of the Court of Appeal that where a workman engaged by a contractor to do work on a railway was killed on that railway in going to his work, the accident did not arise out of and in the course of his employment. But the case would be different where the accident happened on premises over which the employer had control. Compensation cannot be obtained for an injury attributable to "the serious and wilful misconduct of the workman." In order to estimate the average earnings of a workman for the purpose of assessing compensation payable to him, or, in case of his death, to his dependents, the period of employment must be continuous. If there is a break, the average earnings are to be calculated on the period subsequent to it (*Jones* v. *Ocean Canal Company*), and short absences do not always constitute a break (*Price* v. *Marsden*). In the case of a workman's death, only his dependents wholly or partly dependent on his earnings at the time of death, are entitled to compensation (*Simmons* v. *White*).

LONDON HOUSING PROBLEM.

MR. FRED KNEE, general secretary of the Workmen's Housing Council, recently wrote to the Marquis of Salisbury, Mr. Balfour, and Mr. Ritchie, in reference to the housing problem in the metropolis, pointing out that the London County Council was only too anxious to minimise the existing difficulty by providing cheap, sanitary, and suitable dwellings for the working classes, but that they found that any rebuilding scheme within its administrative area was foredoomed to failure on account of the gigantic expense involved, and that they had consequently turned their attention to the possibility of erecting suitable blocks of buildings on some of the open spaces which surround the county of London, with the result that they had been brought face to face with the grave question whether they possessed powers to acquire land outside the area under their control.

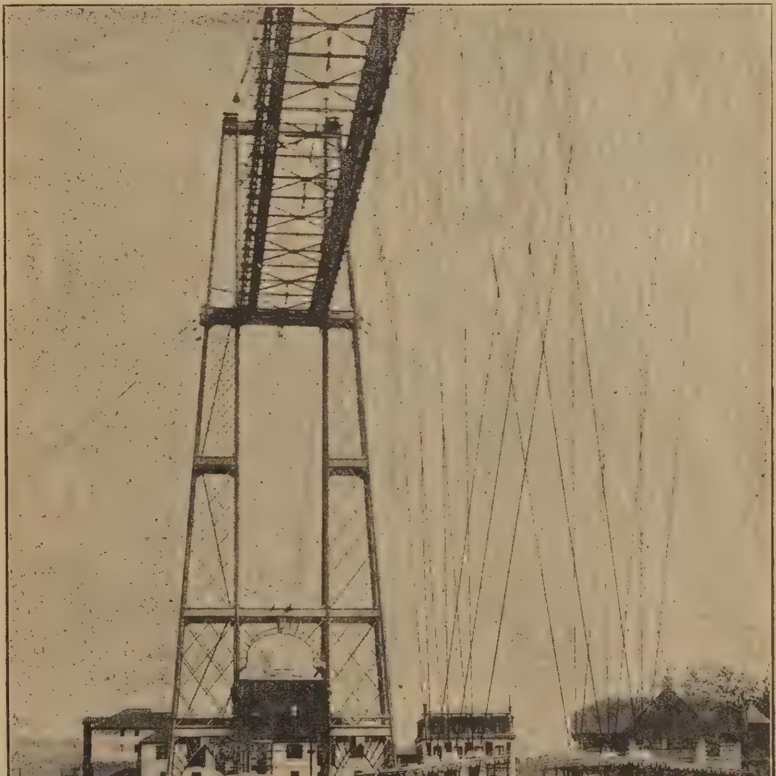
Lord Salisbury says he fully appreciates the grave importance of providing cheaper and better houses, and in far greater numbers than has hitherto been done, to meet the still rapidly growing demand of working men in London for suitable dwellings within a reasonable distance of the localities in which they are obliged to work. At the same time he has not yet satisfied himself as to the best means by which this provision can be made. He promises to give the matter his earnest attention, and should a feasible scheme present itself he sees no reason why it should not be carried out, to the great advantage of the community in general, and the working classes in particular.

Mr. Balfour says he is fully aware of the need for increased and improved housing accommodation for the working classes in our great towns. He has not yet, however, seen any scheme that would satisfactorily meet the requirements of the case. He is watching the present agitation on the question with great interest, and can promise to give any proposals that are made his personal attention.

Mr. Ritchie regrets that the various local governing authorities of the country have so far made little use of the powers conferred on them by Parliament by the Act passed in 1890. He is of opinion that, had such bodies utilised the powers then given to them to the best advantage, much more might have been done to obviate the present congestion of our great cities. At the same time he is prepared to watch the development of present proposals, and should any scheme arise which seems to promise an amelioration of the present evils he will support it.

The Workmen's Housing Council, while fully appreciating the advantage of ministerial co-operation in its campaign, has decided that, if necessary, an amendment calling attention to the housing problem shall be moved when the Address in Reply to the Queen's Speech at the opening of the next session of Parliament is under discussion. Several members of Parliament have already promised to take this step should it be necessary.

Purifying the River Avon.—A poll of the city of Bristol is proposed to be taken with regard to the scheme for taking the sewage out of the river Avon.



"TRANSBORDEUR" BRIDGE AT BILBAO, SHOWING CAR.

Builders' Notes.

A Bridge over the dangerous ford at Broom, near Alcester, is to be built at a total cost of £3,100. Towards this sum £1,250 has been voted by the Warwickshire County Council, while £700 has been promised by the Alcester Rural District Council.

Work Abroad.—In a circular which we have received from the Emigrant's Information Office, 31, Broadway, Westminster, S.W., it is stated that there is a demand for men engaged in the building trades in Western Australia, Tasmania, and New Zealand.

Workmen's Compensation: A Painting Case.—Some time ago David Bradley, a painter, was standing on a scaffold painting some steel bars, at a height of about 50ft., when he fell and sustained such injuries that he died. On December 27th Sheriff Spens, in the Glasgow Sheriff Court, found compensation for the widow for £235. The defendants were the deceased's employers, Messrs. Hobbs and Samuels, of Glasgow.—His Lordship, in a note, said that the question was whether painting fell under the employments covered by the Act—a question of fact, not of law. The work in which deceased was engaged was constructive, and in no sense decorative work. The paint deceased was putting on the steel bars was to prevent the moisture of the atmosphere from affecting them, and it was more necessary in the case of steel than in the case of iron. The defendants, in his opinion, were "undertakers" in the sense of the Act, being persons engaged in undertaking construction repairs or demolition, and he therefore decerned as above.

A Street Case under the London Building Act.—In the case of Armstrong v. London County Council (a special case stated by the magistrates and heard before the Lord Chief Justice and Justices Bigham and Darling) the appellant appealed against the decision of the magistrates convicting him for having commenced to form and lay out a street for carriage traffic without having first obtained the sanction of the Council, pursuant to Section 7 of the London Building Act, 1894. The question was whether the carriage-way proposed to be formed by the appellant would, when formed, be a street within the meaning of Section 7, and the magistrates found that it would. The facts are as follows:—The appellant owns some land adjoining a public carriage-way called the Grove, which communicates by a carriage-way 15ft. wide with the Highgate Road. Appellant intended that the street should run from the Grove through the site to, and to communicate with a footway upon, Parliament Hill; but the respondents refused their sanction because the proposed street would not afford direct communication between two streets formed and laid out for carriage traffic. The appellant then proceeded with the work (which included the pulling down of some old houses and the erection of twenty new ones, approached by a carriage-way from the Grove) without seeking the sanction of the respondents. Drainage plans for the buildings were submitted to the vestry of St. Pancras. It was for the occupants of the buildings only and for tradesmen and others visiting them that the carriage-way was to be used. The question in this case turned upon the true construction of Section 7. Would the way which the appellant had commenced to lay out and form be, when formed, a "street" within the meaning of that section? The justices thought that it would, and the fact that, after proceeding straight for a certain distance, it continued inside or around the proposed square, did not make it any the less a street. It seemed clear that it was not less a street because it was intended to be used as a private way, for the interpretation section (5) in no way so limited "street." They were clearly of opinion that the appellant had commenced to form and lay out a street within the meaning of Section 7, and as he did so without having obtained the sanction of the respondents he committed the offence of which he has been convicted. The appeal would, therefore, be dismissed with costs.

British Institute of Certified Carpenters.—In the report for session 1899, it is stated that it has been decided to print an annual journal giving items of interest relating to the Institute and papers read at its meetings. There is at present a balance in hand of £27 12s. 5d. The present president is Professor T. Roger Smith, F.R.I.B.A., who succeeds the late Professor Banister Fletcher. The Institute was founded in 1890, and its address is, Carpenters' Hall, London Wall, E.C.

Messrs. Julius Sax and Co., Ltd., electrical engineers, of 119, Coldharbour Lane, Camberwell, S.E., send us a copy of their new calendar, which represents an electric bell. Messrs. Sax claim to be the oldest and best manufacturers of the English variety of these instruments. They have lately been reorganising their business, and are now adding further machinery to cope with the increasing amount of Government work which they have been fortunate enough to obtain. They inform us that they will be glad to send a copy of their calendar to any of our readers who will communicate with them.

Masters and Men.

The Plasterers of Bradford, it has been agreed, shall receive 9½d. per hour. They had asked for 10d. per hour, and the masters offered 9d., a compromise being ultimately agreed to.

Grave Building Crisis at Edinburgh.—A very grave crisis has arisen in the building trade at Edinburgh, and two firms have had to suspend payment. One of these is probably the largest firm of speculative builders in the city, and liabilities are understood to be of very large amount.

Wages in Switzerland, Italy, and Austria.—In Switzerland the rates of wages vary greatly. In the iron, steel, and other metal trades, wages vary from 2s. 4½d. to 4s. 9½d.; a few reach 5s. 7d.; the major portion vary from 3s. 2d. to 4s. per day. Woodworkers, 2s. 4d. to 4s.; building operatives, 2s. 4d. to 4s.; a few 4s. 9d. per day. In Italy wages are low—building operatives, 2s. 6d. to 3s.; engineers, all under 3s. In Austria, ironworkers, from 1s. 5d. to 4s. 1¾d., according to the district. Engineers of various branches range from 2d. per hour to 1s., inclusive of overtime, but only 44 reach that limit, 37 reach 8d. per hour, and 127 only 7d. per hour; all others are under 6d. per hour.

Parliamentary Labour Representation.—A conference of representatives of the Trade Union Congress, the Social Democratic Federation, the Independent Labour party, the Fabian Society and co-operative societies will take place at the Memorial Hall, London, next month to consider how the cause of labour representation in the House of Commons may be most effectually promoted. The first resolution to be submitted will be in the nature of a preamble, declaring the desirability of working-class opinion being represented in the House of Commons by men sympathetic with the aims and demands of the labour movement. To this end it is proposed to organise the different agencies which have hitherto pursued the same object on independent lines. A resolution will be moved that an executive committee be appointed, consisting of ten or twelve representatives from trade unions, four from the co-operative societies, two from the Fabian Society, two from the Independent Labour party and two from the Social Democratic Federation. The units of this body are to be elected by their respective organizations. The functions of this committee, so far as they have been outlined, will be to keep in touch with trade unions and other organisations, local and national, which are running labour candidates, so that there may be no overlapping, and that united effort may be concentrated to the best advantage. The administration of funds will also fall to the responsibility of this executive. It is intended that the representatives on the committee should hold themselves responsible to the Trade Union Congress and other bodies by whom they are nominated.

A Leeds Building Dispute.—At the meeting of the Leeds City Council last week on the presentation of the minutes of the Lighting Committee the question of a dispute between the building labourers and a firm to whom it was proposed to let a contract arose. The question was dealt with at the December meeting of the Council, when it was referred back to the Committee; since this meeting the Committee has had an interview with the Labourers' Union, but had not been able to quite understand the bearings of the question as between the men and the masters. They therefore again asked that the minutes recommending the acceptance of the tender of the firm to whom objection had been made should be confirmed. They had invited the Masters' Association to meet them, in order to try and clear up the point that had arisen.—Mr. Connellan, in renewing his amendment of a month ago, that the matter should be referred back, said that the firm in question claimed to pay one section of the labourers below the standard rate of wages for excavating work, and he was of opinion that by the settlement of 1896 no distinction could be drawn between one class of work and another. The rate of payment was 6½d. per hour, and there was an endeavour to use the Corporation as a lever to lower the rate of wages.—Mr. Wilson could not agree with Mr. Connellan's definition; there were two classes of labourers in this particular trade—the bricklayer's labourer and the navvy.—The amendment was eventually withdrawn on it being pointed out that the Committee were pledged to inquire into the matter and would see there was no shirking of the fair contract clause.

Trade and Craft.

BRUSHES.

That articles of the best quality are the cheapest in the end is a truism that has proved its value to many who would otherwise desire to employ second-quality goods. This will be found especially the case with brushes, for it is false economy to buy cheap brushes, meaning of course by the word "cheap," brushes that are not of the best quality. Messrs. G. B. Kent and Sons, of 75, Farringdon Road, London, E.C., have a reputation as manufacturers of good brushes for all kinds of painting and similar work. In the preface to their new catalogue they state that every pattern has been very carefully calculated, and, considering the standard quality of their brushes, they feel confident that no better value is obtainable. The prices given are this time subject to alteration without notice, as there is reason to fear that the top prices for bristles have not been reached. It is hardly necessary to say that Messrs. Kent make brushes for all kinds of work, both large and small. In the red sable hair varieties prices have dropped materially owing to an alteration in the fashion for furs, and this is a good example of the relation that exists, sometimes most subtly, between fashion and trade. In addition to brushes, Messrs. Kent supply blow lamps, knives, and all painters' requisites. It is a fitting compliment (showing in what estimation it is held) that they have reprinted from that excellent publication "Specification," at the front of their catalogue, a number of hints on the selection, care, and treatment of brushes for painting and decorative work.

Chatham Town Hall will be opened by Lord Rosebery on January 23rd. The building has just been completed at a cost of £30,000.

Surveying and Sanitary Notes.

Two Lady Sanitary Inspectors for West Ham are to be appointed.

High Street, Kensington, is proposed to be widened to about 60ft. to the east of Church Street.

The Chicago Drainage Canal, which was described in our issue for December 27th, has now been opened.

Duns Lane, Leicester, is to be widened to 50ft. for a considerable distance (though it will still be 43ft. in one portion) at an estimated total cost of about £11,000.

A Manchester Improvement.—The Local Government Board have sanctioned the borrowing of £26,000 for the purchase of land in Whitworth Street and Sackville Street, near the Manchester Technical School, for an open space.

Leeds Street Improvements.—It has been decided to purchase property at a cost of about £15,000 to enable the following streets to be widened and improved:—Meadow Road, Jack Lane, Nile Street, Millshaw, Beeston, South Accommodation Road, Cross Lane, Farnley, and Town Street, Beeston.

New Streets at Coventry.—A new street is to be made to relieve High Street and Hertford Street. Little Park Street will be pierced just above the Mayor's house, the road will be crossed to a new thoroughfare to be made through the park, and exit will be in Eaton Road, near the railway station. A new street is also to be made from Gosforth Street, through Whitefriars, and to finish also in Eaton Road.

New Sewage Works at Keith are now completed, so far as the contractor, Mr. Roderick Mackay, of Aberdeen, is concerned, and will shortly be opened. Messrs. Jenkins and Marr were called in about three years ago, and formulated a scheme; the outfall disposal of the sewage has presented many difficulties. The sewer is carried along the banks of the Isla, and at several places, the ground being of a very soft nature, has had to be supported by concrete walls and piping.

Sanitary Inspectors' Association.—In the course of his New Year's address on Saturday last, Sir Hugh Gilzean Reid, the president, condemned the arrangement by which there was a Board of Examination for Sanitary Inspectors which did not include one of their order. They were prudently promoting a Bill in Parliament to define the technical qualifications and to fix definitely the tenure of office of sanitary inspectors, objects which he held were vital to their professional position.

Sanitary Inspectors.—The following have been elected as the Executive Council of the South Wales and Monmouthshire Sanitary Inspectors' Association for the ensuing year:—Messrs. Llewellyn Davies, Swansea; W. Fraser, Llandaff and Dinas Powis; W. J. Hopkins, Barry (Port); W. J. Hughes, Rhondda; J. Preece James, Tenby; David Jenkins, Cardiff (Port); James Jones, Gelligaer and Rhigos; Spencer E. Jones, Newport; W. Lloyd Marks, Rhymney; John T. Owen, Merthyr; J. Towy Thomas, Rhondda; David Vaughan, Cardiff; T. W. Warren, Cardiff; and W. Williams, Rhondda.

Open Spaces.—At the monthly meeting of the Metropolitan Public Gardens Association held last week, Lord Teynham in the chair, it was stated that the City Corporation were introducing a Bill next session to enable Finsbury Circus Garden to be opened to the public. Progress was reported with regard to schemes for securing the churchyards of Christ Church, Blackfriars, and of St. Giles's, Camberwell, Marion Square, Bethnal Green, Albert Square, Commercial Road, and vacant sites at Shadwell and at Sumner Road, Camberwell. It was reported that the committee for securing an addition of forty-two acres to Brockwell Park upon which the association was represented, had now secured promises of £15,000 from the Lambeth Vestry, £6,000 from the Camberwell Vestry, and £1,500 from the Newington Vestry; the total sum required is £72,000.

The Public Health during 1899.—The following table shows the death rate during the past year for the thirty-three great towns:—

Birkenhead	19·2	Liverpoo	26·4
Birmingham	20·8	London	19·8
Blackburn	18·9	Manchester	24·6
Bolton	19·9	Newcastle	20·6
Bradford	18·4	Norwich	17·3
Brighton	19·0	Nottingham	20·2
Bristol	18·2	Oldham	20·5
Burnley	19·6	Plymouth	21·7
Cardiff	15·5	Portsmouth	19·7
Croydon	15·0	Preston	22·8
Derby	16·9	Salford	23·8
Gateshead	18·8	Sheffield	22·2
Halifax	18·3	Sunderland	21·5
Huddersfield	16·3	Swansea	18·2
Hull	19·3	West Ham	16·7
Leeds	19·2	Wolverhampton	21·9
Leicester	17·8	All	20·2

The Northwich Sewerage Scheme.—At the last meeting of the Northwich Urban Council a letter was read from the Local Government Board stating that, subject to the conditions that the pipe sewers would be surrounded with concrete where they were laid at a greater depth than 15ft., the Board would consent to the borrowing by the Urban Council of £25,000 for purposes of sewerage and sewage disposal in the Castle Ward. They, however, referred to the evidence given at the inquiry as to the urgent necessity for a proper system of sewerage and sewage disposal in the remaining portions of the urban district, and they urged the Council to take into immediate consideration, in consultation with their engineer, the question of dealing with these areas. The letter was referred to a committee.

The new London Improvement Bill, which the Council will promote in Parliament next session, includes the following expenditures:—The Thames Embankment extension and improvements at Westminster, £1,319,000; Mare Street, Hackney, widening, £660,750; Goswell Road widening, £227,800; St. John Street (Clerkenwell) widening, £92,400; Blackstock Road (Islington) widening, £5,200; Archway Road (Islington) widening, £6,000; Kentish Town Road widening, £10,450; Nine Elms Lane widening, £171,300; Camberwell New Road widening, £53,000; Harleyford Street (Lambeth) widening, £16,900; Streatham High Road widening, £194,200; widenings at Battersea Rise, Wandsworth Common, and Westhill, Wandsworth, £60,800; widenings at Blackheath Road, Blackheath Hill, Shooter's Hill Road, and New Road, £41,200; widenings at Lewisham High Road, Loampit Hill, Loampit Vale, Lee High Road, and Eltham Road, £86,500; High Street and Gardener's Lane, Putney, widening, £45,030; Maclise Road (extension to Hammersmith Road), £4,560; total, £2,995,090.

The Repair of Canal Bridges.—At the Stafford County Court last week Messrs. John Joule and Sons, Ltd., brewers, Stone, brought an action against the Staffordshire and Worcestershire Canal Company to recover £19 12s. as damages in consequence of the bad condition of a road, for the repair of which, it was alleged, the defendants were responsible. On August 5th a man in the employ of the plaintiffs was driving a brake down the slope from the canal bridge at Tixall, when the horse fell and was injured. The fall was due to the roadway giving way owing to the burrowing of rabbits. It was admitted that the accident occurred within 57ft. from the centre of the bridge; therefore the question for the judge was whether the Act of Parliament passed during the reign of George the Third made the canal company liable to repair the roadway on each side of the bridge from the points where the diversion had originally been made from the original road, the defendants disclaiming all liability except as to the repair of the structure of the bridge.—His Honour (Judge Mulholland) decided in favour of the plaintiffs' contention that the canal company were bound to repair the approaches to the bridge. Defendants' counsel then took the objection that an action for special damages would not lie against the canal company, and that they could only be proceeded against by indictment for the non-repair of the road. Plaintiffs' counsel while admitting that an action could not be brought against a highway authority for the non-repair of a road, contended that there was a distinction between a public body and a company which was established for the profit of the shareholders.—His Honour upheld the objection, and dismissed the action, but as the company had neglected to repair the road he did not give costs.

Engineering Notes.

Mr. Thomas Trewhitt, of Hutton House, West Hartlepool, died on Wednesday last at the age of seventy. He was the secretary of the Hartlepool Gas and Water Company.

Panama Canal.—It is reported than an American company has been formed, with a capital of thirty million dollars, to take over the Panama Canal works and complete them.

Mr. Richard Boyse Osborne, one of the most eminent civil engineers in America, died last week. He designed and built the first Howe truss-roof and bridges ever erected in Great Britain.

Proposed Damming of Niagara River.—A dam across the Niagara river to regulate the levels of the Great Lakes and their connecting waterways is provided for in a Bill which will be introduced in Congress.

Three Millions for Light Railways in Middlesex.—Sir F. Dixon-Hartland, M.P., chairman of the Finance Committee of the Middlesex County Council, estimates the cost of the Council's schemes for the construction of light railways within the county at £3,000,000.

Bolton Electric Tramways.—The electric tramway system at Bolton was inaugurated last week, cars running for the first time on seven of the ten routes constituting the system. There are about thirty-one miles of track, covering twenty-eight miles of street, and the system is one of the largest of its kind in England.

The Lighting of New York.—The Consolidated Gas Light Company announced last week that it had absorbed the New York Electric Lighting and Heating Company. This will make the Consolidated the most powerful illuminating company in New York, and will put it in a position to make a strenuous attempt to unite all the gas and electric light companies in the city.

Electric Lighting at Leigh.—Leigh is the latest municipality to adopt electric lighting. The installation has cost over £10,000, and is on the three-wire system, at a pressure of 440 volts. The charges are 7d. per unit for the first hour, and 2½d. per unit afterwards. A committee of Town Councillors have also under consideration the question of electric traction.

Successful Municipal Trading.—At the meeting of the Dover Corporation last week, it was stated that the municipal waterworks had yielded a profit of £3,500 on the year. This, together with a profit of over £2,000 on the municipal electric trams, is equal to a reduction of 1s. in the pound on the town's rates. The water is supplied at the rate of 10s. per annum per house of £20 rateable value, and so on in proportion. This is said to be the lowest water rate in the kingdom.

Electric Expresses between Manchester and Liverpool.—The Manchester and Liverpool Electric Express Railway Company seek powers, in a Parliamentary Bill, to construct a railway about 34½ miles long, commencing on the west side of Deansgate, Manchester, passing thence via Salford, Pendleton, Eccles, Widnes, Halewood, Garston, and Toxteth Park to its termination in Liverpool, near the entrance gate of the Bluecoat Hospital in School Lane. The capital required for the construction of this railway is £2,000,000, and electrical power is to be taken from a generating station in the parish of Great Sankey; the line will be constructed on the monorail system.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—		
Jan. 12	Aberavon—Chapel	Primitive Methodist Trustees	F. B. Smith, Architect, Port Talbot.
,, 13	Kilkeel, Ireland—Masonic Hall	....	R. B. Wray, Kilmorey Arms Hotel, Kilkeel.
,, 13	Bawtry, Yorks.—Church Restoration	....	Boreham and Morton, 24, John-street, Sunderland.
,, 13	Guildford—Schools	School Board	A. J. Sturgess, 25, High-street, Guildford
,, 13	Huddersfield—Homes	Guardians	J. W. Cocking, Cloth Hall-street, Huddersfield.
,, 13	Llanrhaiadr-yn-Mochnant, Wales—Hall	Parish Council	D. Evans, Clerk, Oswestry.
,, 15	Grimsby—Workhouse Extension	Guardians	H. C. Scaping, Court Chambers, Great Grimsby.
,, 15	Drumshemuck (Ireland)—Farm Outoffices	....	R. Scott, 15, Willoughby-place, Enniskillen.
,, 15	Tunbridge Wells—Enlargement	Corporation	W. C. Cripps, Town Hall, Tunbridge Wells.
,, 15	Chiswick—Generating Station	Aberystwyth and Chiswick Electricity Supply Corporation Limited	Kincaird, Waller, and Manville, 29, Great George-street, Westminster.
,, 15	Oxford—School	School Board	F. P. Morrell, 1, St. Giles, Oxford.
,, 15	London, W.—Warehouse	S. Goff and Co.	S. Goff and Co., 83, Long-acre, W.
,, 15	Bradford—Warehouse	....	Milnes and France, Architects, Bradford.
,, 15	Clonmel, Ireland—Works	....	W. H. Byrne, Architect, 20, Suffolk-street, Dublin.
,, 15	Kingsclere and East Woodhay, Hants.—Alterations	County Council	W. J. Taylor, The Castle, Winchester.
,, 15	Limavady, Ireland—Masonic Hall	St. Alban's Lodge	W. J. and M. Given, Architects, Diamond, Coleraine.
,, 15	Oldham—Baths	Corporation	C. T. Taylor, Architect, 10, Clegg-street, Ireland.
,, 15	Penygroes, Wales—Residence	Wesleyan Methodists	Rev. H. Carry, Penygroes.
,, 16	Birkenhead—Electricity Generating Station	County Borough	C. Brownridge, Engineer, Town Hall.
,, 16	Chadderton, near Oldham—Police Station	Standing Joint Committee	H. Littler, Architect, County Offices, Preston.
,, 16	Malton, Yorks.—Court House	....	County Surveyor, Northallerton.
,, 17	London, N.W.—Foundations, &c.	Willesden Guardians	A. Saxton Snell, 22, Southampton-buildings, Chancery-lane, London, W.C.
,, 17	Blackburn—Greenhouse	Parks Committee	W. Stubbs, Engineer, Municipal Office, Blackburn.
,, 17	Portsmouth—Bakers' Ovens	Guardians	Rake and Cogswell, Prudential-buildings, Landport.
,, 17	Scunthorpe, Lincs.—Buildings	Urban District Council	Stevenson and Burstal, 38, Parliament-street, Westminster.
,, 19	Brighton—Conveniences	Corporation	F. J. C. May, Town Hall, Brighton.
,, 19	Halesowen—Hospital	Hospital Committee	A. T. Butler, Architect, High-street, Cradley Heath.
,, 19	Leeds—Wall	Corporation	City Engineer's Office, Municipal-buildings, Leeds.
,, 20	Sheffield—Nurses' Home	Guardians	Union Offices, Westbar, Sheffield.
,, 20	Ardara, Ireland—Manse	....	J. M. Robinson, 7, James street, Omagh.
,, 20	Hull—Public Library	Corporation	J. S. Gibson, 4, Gray's Inn-square, W.C.
,, 22	Blackburn—Hospital Extension	Health Committee	W. Stubbs, Engineer, Municipal Offices, Blackburn.
,, 23	Lewisham—Public Lavatories, &c.	Board of Works	Surveyor, Lewisham Town Hall, Catford, S.E.
,, 23	Manchester—Urinals	Sanitary Committee	City Surveyor, Town Hall, Manchester.
,, 25	Knutsford—Chapel	Urban District Council	R. J. Macbeath, Architect, Birnham House, Sale.
,, 26	St. Pancras—Baths and Washhouses	Vestry	T. W. Aldwinckle, 1, Victoria-street, S.W.
,, 27	Brambridge, Hants.—Bridges	Hursley Rural District Council	Lemon and Blizard, Lansdowne House, Castle-lane, Southampton.
,, 27	Marazion, Cornwall—Additions	....	A. C. Jenkin, 3, Parade passage, Penzance.
,, 29	Sunderland—School	School Board	Office of Board, 15, John-street, Sunderland.
,, 29	Stratford-on-Avon—Wall	Town Council	Roden Dixon, Municipal Offices, Stratford-on-Avon.
,, 31	Sheffield—Works	Health Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
eb. 1	Belfast—Hospital	Hospital Building Committee	W. H. Stephens & Son, 13, Donegall-square North, Belfast.
	ENGINEERING—		
Jan. 12	Ruabon, Wales—Pipelaying	....	Dennis and Son, Ruabon.
,, 12	Rotherham—Pipes and Pipelaying	Rural District Council	J. Gregory, Brampton House, West Melton, nr Rotherham.
,, 13	London, S.E.—Dust Destructor	Bermondsey Vestry	Town Hall, Spa-road, Bermondsey.
,, 13	Hemsworth, near Wakefield—Waterworks	Rural District Council	S. H. Richardson, Engineer, Hemsworth.
,, 13	Ruskington, Lincs.—Waterworks	Urban District Council	J. Clare, Engineer, Sleaford.
,, 15	Carmarthen—Bridge	Rural District Council	Rowland Browne, 7, Hall-street, Carmarthen.
,, 15	Inverness—Harbour Works	....	J. Fraser, Civil Engineer, Inverness.
,, 15	Tunbridge Wells—Condensing Plant	Corporation	Electrical Engineer's Office, Tunbridge Wells.
,, 15	Elie St. Monans, Scotland—Reservoir	Local Authorities	Belfrage and Carfrae, 1, Erskine-place, Edinburgh.
,, 16	Newcastle-on-Tyne—Generator	New Tramways Committee	C. Hopkinson, 29, Princess-street, Manchester.
,, 16	Gomersal, Yorks.—Sewers	Urban District Council	J. Waugh, C.E., Engineer, Sunbridge-chambers, Bradford.
,, 18	Handcross, Sussex—Water Tower	Cuckfield Rural District Council	J. Mansergh, 5, Victoria street, Westminster.
,, 19	Pluck's Gutter, near Ramsgate—Bridge	....	W. A. Valon, Hardres-street, Ramsgate.
,, 20	Ilford—Electric Lighting Plant	Urban District Council	J. W. Benton, Council Offices, Ilford.
,, 20	Oban—Extension of Railway Quay	Callander and Oban Railway Co.	T. M. Barr, Engineer, Northern Division, Caledonian Railway, Perth.
,, 20	Manchester—Reconstruction of Culvert	Paving Committee	City Surveyor, Town Hall, Manchester.
,, 22	Glasgow—Machinery	Corporation	D. Home-Morton, 95, Bath-street, Glasgow.
,, 23	Barking—Electric Lighting Plant	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
,, 23	London, N.—Laundry Machinery	Holborn Union	J. Buley, Engineer, Suffolk House, Lawrence Pountney Hill, E.C.
,, 25	Hastings—Boilers	Guardians	Jeffrey and Skiller, 5, Havelock-road, Hastings.
,, 26	Valetta, Malta—Waterway in Tunnel at Sea-level	....	Superintendent of Public Works, Valetta.
,, 31	Ayr—Pumping Plant	Magistrates and Council	J. Young, Town Buildings, Ayr.
Mar. 1	Melbourne—Electric Lighting Plant	Corporation	Agent-General for Victoria, 15, Victoria-street, Westminster.
	IRON AND STEEL—		
Jan. 18	London, S.W.—Iron Gates	Metropolitan Asylums Board	Office of Board, Norfolk House, Norfolk-st., Strand, W.C.
,, 18	London, N.W.—Iron Balcony Railways, &c.	Metropolitan Asylums Board	Office of Board, Norfolk House, Norfolk-st., Strand, W.C.
,, 19	Leeds—Railings	Corporation	City Engineer's Office, Municipal-buildings, Leeds.
,, 30	Great Yarmouth—Rails	Town Council	J. W. Cockrill, Borough Surveyor, Town Hall, Gt. Yarmouth.
Feb. 1	Cork—Soleplates	Cork, Bandon, and South Coast Rly.	J. R. Kerr, Railway Station, Bandon.
	PAINTING AND PLUMBING—		
Feb. 5	Manchester—Painting	Lancashire and Yorkshire Railway Co.	Engineer, Hunts Bank, Manchester.
	ROADS AND CARTAGE—		
Jan. 12	Durham—Private Street Works	Rural District Council	G. Gregson, Eastwood, Western Hill, Durham.
,, 12	Preston, Lancs.—Paving, &c.	Corporation	Borough Surveyor, Town Hall, Preston, Lancs.
,, 15	London, W.—Materials	Paddington Vestry	Surveyor, Vestry Hall, Harrow-road, W.
,, 15	Wimbledon—Making-up Road	Urban District Council	Surveyor, The Broadway, Wimbledon.
,, 16	Fleetwood, Lancs.—Flagging, &c.	Urban District Council	E. Frobisher, Surveyor's Office, Town Hall, Fleetwood.
,, 17	Birkenhead—Street-making	Corporation	C. Brownridge, Surveyor, Town Hall, Birkenhead.
,, 17	Hemel Hempstead—Street Works	....	W. R. Locke, Surveyor, Town Hall, Hemel Hempstead.
,, 18	Axbridge—Materials	Rural District Council	G. Cook, Surveyor, Axbridge, Weston-super-Mare.
,, 19	Monkton and Stourmouth, Ramsgate—Road	....	L. W. Hogbin, Surveyor, Birchington.
,, 22	Plymouth—Making-up	....	J. Paton, Borough Engineer and Surveyor.
,, 27	St. Annes-on-the-Sea—Making-up	Urban District Council	The Surveyor, Park-road.
Feb. 5	Midhurst, Sussex—Various	Rural District Council	A. G. Gibbs, Council Offices, Midhurst.
	SANITARY—		
Jan. 13	Darlington—Sewers	Rural District Council	H. T. Neilson, 7, Horse Market, Darlington.
,, 15	Paddington—Sewers	Vestry	Surveyor, Vestry Hall, Harrow-road, W.
,, 15	Hull—Drainage	Guardians	T. Beecroft Atkinson, 11, Trinity House Lane, Hull.
,, 18	Kirkby-in-Ashfield—Sewerage Works	Urban District Council	H. Silcock, 14, Westgate, Mansfield.
,, 18	Valetta, Malta—Pipes	....	Crown Agent for Colonies, Downing-street, London.
,, 18	Isle of Thanet—Sewerage Works	Rural District Council	A. Latham, Municipal-buildings, Margate.
,, 22	Uxbridge—Sewers	Rural District Council	J. Anstie, 10, Marchwood-crescent, Ealing.
,, 23	Tottenham—Sewers	Urban District Council	P. E. Murphy, 712, High-road, Tottenham.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan. 31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.
Feb. 12	Barnsley, Yorks.—Church and Vicarage	£52 10s., £31 10s., £21	Lancaster and Sons, Church-street, Lancaster.
,, 28	Doncaster—Isolation Hospital	£25, £15	F. E. Nicholson, Solicitor, Union Offices, Doncaster.
Mar. 12	Belfast—Assembly Hall	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast.
,, 31	Walsall—Municipal Buildings	£100 awarded to each selected competr.	J. R. Cooper, Town Clerk, Borough Offices.
,, 31	Springfield, Essex—Constabulary Headquarters	£100, £50, £25	H. W. Gibson, Shire Hall, Chelmsford.

Property and Land Sales.

FREEHOLD BUILDING LAND to be LET on LEASE, or SOLD in PLOTS; fronting on main road, and close to golf links and Highgate Woods; near Muswell Hill and East Finchley Stations. Liberal advances if required to responsible Builders.—For plans and particulars apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington Road, N. 6

HARROW-ON-THE-HILL.—Three acres of eligible Lands abutting on main road, laid out for small villa or cottage residences, five minutes from town and schools and proposed railway station, TO BE LET on Building Lease, or FREEHOLD will be sold. —For terms and particulars apply to BENTWICH WATKIN WILLIAMS and GRAY, Solicitors, Corporation-chambers, Guildhall-yard, E.C.

Sales by Auction for the Year 1900.—Messrs.

DEBENHAM, TEWSON, FARMER, and BRIDGEWATER beg to announce that their SALES for 1900 of ESTATES, Investments, Town, Suburban, and Country Houses, Business Premises, Building Land, Ground-rents, Advowsons, Reversions, Stocks Shares, and other Properties will be held at the Auction Mart, Tokenhouse-yard, near the Bank of England, in the City of London, as follows:—

Tuesday, January 16th
Tuesday, January 30th
Tuesday, February 13th
Tuesday, February 20th
Tuesday, February 27th
Tuesday, March 6th
Tuesday, March 13th
Tuesday, March 20th
Tuesday, March 27th
Tuesday, April 3rd
Tuesday, April 10th
Tuesday, April 24th
Tuesday, May 1st
Tuesday, May 8th
Tuesday, May 15th
Tuesday, May 22nd
Tuesday, May 29th
Tuesday, June 12th
Tuesday, June 19th
Thursday, June 21th
Tuesday, June 26th
Thursday, June 28th
Tuesday, July 3rd
Thursday, July 5th
Tuesday, July 10th
Thursday, July 12th
Tuesday, July 17th
Thursday, July 19th
Tuesday, July 24th
Thursday, July 26th
Tuesday, July 31st
Tuesday, August 14th
Tuesday, October 9th
Tuesday, October 23rd
Tuesday, October 30th
Tuesday, November 13th
Tuesday, November 20th
Tuesday, December 4th

By arrangement, Auctions can also be held on other days in town or country. Messrs. Debenham, Tewson, Farmer, and Bridgewater undertake Sales and Valuations for Probate and other purposes of Furniture, Pictures, Farming Stock, Timber, &c.

Detailed Lists of Investments, Estates, Sporting Quarters, Residences, Shops, and Business Premises to be Let or Sold by private contract are published on the 1st of each month, and can be obtained of Messrs. DEBENHAM, TEWSON, FARMER, and BRIDGEWATER, Estate Agents, Surveyors, and Valuers, 80, Cheapside, London, E.C. Telephone No. 503, Bank.

SALE DAYS for the Year 1900.
Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, January 11th
Thursday, January 25th
Thursday, February 8th
Thursday, February 22nd
Thursday, March 8th
Thursday, March 22nd
Thursday, April 5th
Thursday, April 26th
Thursday, May 10th
Thursday, May 24th
Thursday, June 7th
Thursday, June 21st
Thursday, June 28th
Thursday, July 5th
Thursday, July 12th
Thursday, July 19th
Thursday, July 26th
Thursday, August 2nd
Thursday, August 9th
Thursday, September 27th
Thursday, October 11th
Thursday, October 25th
Thursday, November 8th
Thursday, November 22nd
Thursday, December 6th
Thursday, December 13th

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

HAMMERSMITH-ROAD, W.—Important Building Site.—Preliminary Notice of Sale by Auction.—
Messrs.

CHESTERTON and SONS are instructed to SELL by AUCTION at the Mart, E.C., on THURSDAY, JANUARY 25th, 1900, at TWO o'clock, the valuable FREEHOLD PROPERTIES, Nos. 92, 98, 100, 102, 104, 106, 108, Hammersmith-road, together with Forty-seven Cottages and the Black Horse Beerhouse, in Brook Green-place at the rear, the whole forming an excellent building site of over 1½ acres. Also the valuable FREEHOLD INVESTMENT, No. 46, Brook-green.

Particulars of Solicitors, Messrs. MILLER, SMITH, and BELL, 3, Salter's Hall-court, Cannon-street, E.C.; Messrs. HASTIES, 65, Lincoln's Inn-fields, W.C; H. P. SMALLPIECE, Esq., Guildford; Messrs. SHORE and KING, Birmingham; E. F. DAY, Esq., Nos. 5 and 6, Clement's-inn, W.C.; and Messrs. CROWDERS and VIZARD, 55, Lincoln's Inn-fields, W.C. Auctioneers' Offices, 51, Cheapside, E.C., and 140, Kensington High-street, W.

SEASIDE LAND. — A FEW PLOTS remain on Seaside Estate to be LET on perpetual lease for erection of semi-detached houses. All hitherto erected have sold prior to completion. Finances arranged for Builders, if desired.—Address H. E. MOORE, Esq., Surveyor, 41, Bedford-row, London, W.C.

SOUTHALL, MIDDLESEX.—A very desirable Freehold Building Estate, comprising about 8¼ acres of land, now ready for development for the erecting of working men's residences, which are in great demand in the locality; this estate is only a short distance from the station, and frequent trains are run by the G. W. Railway Company to London at practically nominal rates to workmen, which has created a great demand for workmen's residences, for which this land is admirably suited.

MESSRS. GLASIER and SONS will SELL by AUCTION the above valuable FREEHOLD BUILDING ESTATE, at the Mart, Tokenhouse-yard, E.C., early in February, 1900, in One Lot.

Particulars and plan may shortly be had of Messrs. BURTON, YEATES, and HART, Solicitors, 23, Surrey-street, London, W.C.; and of the AUCTIONEERS, 7, St. James'-street, London, S.W.

To Land Companies, Builders, Speculators and others.

RAMSGATE.—Valuable Freehold Building Estate (a large portion of which has been already developed), extending from the High-road to Margate to the main road to Broadstairs, and having considerable frontages to numerous roads which are made, some kerbed, channelled, and taken over by the town, and comprise in all about thirty-one acres.

MESSRS. GLASIER and SONS will SELL by Auction, at the Mart, City, on Thursday, Feb. 1, 1900, at Two o'clock, in One or more Lots, the above very valuable FREEHOLD PROPERTY, known as the Dane Park Estate.

Particulars and conditions of sale, with plan, may be had of Messrs. KING and M'MILLIN, Solicitors, 39, Bloomsbury-square, W.C.; at the Mart, and of the AUCTIONEERS, 7, St. James'-street, S.W.

R.I.B.A. EXAMS. PREPARATION, personally or by correspondence, in three, six, nine, or twelve months' courses. Architectural Lending Library. Special three months' finishing courses. — For full particulars apply to Messrs. HOWGATE and BOND, Associates R.I.B.A., Perchard House, 70, Gower-street, W.C. (close to the British Museum

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For Exhibitions or Law Cases.
Illustrations sent of Work Executed.
JOHN B. THORP, 98, Gray's Inn-road, W.C.

R.I.B.A., Society of Architects, and Civil Service Technical Examinations. Personal, correspondence, or resident preparation. Seventeen first places.—MIDDLETON and CARDEN, Associates R.I.B.A., 19, Craven-street, W.C.

APPOINTMENTS VACANT.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two.

WANTED. — Two good PLASTERERS, well up in "Situ" Staircases and Artificial Stone dressings; permanency for good reliable men.—Apply, Box 1263, BUILDERS' JOURNAL. 3

CLERK of WORKS WANTED in the South of London. Salary three guineas per week.—Apply by letter only, with particulars of previous appointments, but without original testimonials, to Messrs. CUBITT and COLLINSON, 2, Broad-street Buildings, E.C.

FOREMAN of JOINERS WANTED IMMEDIATELY. Must be a good manager of men, accurate setter-out, and accustomed to modern machinery.—Apply C. PEERLESS DENNIS and Co., Builders, Eastbourne.

A VACANCY will occur during the next two months for a thoroughly competent GENERAL CLERK, who must be a good draughtsman, very accurate in taking off quantities, and accustomed to estimate for all work in a large builder's and contractor's business.—Apply C. PEERLESS DENNIS and Co., Builders, Eastbourne.

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DESIGNS, PERSPECTIVES, TRACINGS.
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DIFFICULTIES of PRACTICE advised upon.
F. BRENT, 34, Great James-street, W.C. 26

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AND
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(*The Average is Seven Words to a Line.*)

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Four Lines or under (about 30 words)	1	6
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Three Insertions for the price of Two.
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(Post Free.)

Advertisement and Publishing Offices:
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Important to Architects.

It often happens that in addition to preparing plans for the erection of a public building or private house, an architect is called upon to carry out a scheme of interior decoration and furnishing.

In order that this may be done satisfactorily it is necessary to take into consideration the style to be adopted in relation to the architecture of the building treated, and also the schemes of colour and materials to be used in the decoration of surfaces.

Formerly the difficulty has been to find an authoritative publication which would be a reliable guide to those engaged in this branch of the profession, and one which would introduce new ideas for interior decoration in addition to keeping a record of all the novelties introduced by the manufacturers of furniture and fittings.

The proprietors of the "Builders' Journal" have therefore pleasure in directing the attention of the profession to their new monthly publication **THE FURNISHER,** *which deals exhaustively with all branches of the furnishing trades. This publication is divided into sections dealing with "Furniture and Upholstery," "Decoration," "Metal Work," "Lighting and Heating," "Pottery, China and Glass," and "Silver and Electro-plate." Each issue contains original designs and suggestions by well-known modern designers, and plates are given from time to time, with examples of the best work of some of the older schools. The journal is printed on superior paper, and illustrated in first-class style, and is worthy of the attention of all who have in any way to deal with the furnishing and decorating of public buildings or private dwellings.*

PUBLISHED ON THE 15th OF EACH MONTH.

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS.

JANUARY 17, 1900.
No. CCLVIII.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

THE BUILDING TRADES GIFT AND OURSELVES.

WE START A "B. J." FUND WITH 1000 SHILLINGS.

A SCHEME has been set on foot, and is already being prosecuted with vigour, for the erection at Bisley of a Home of Rest for discharged soldiers as a gift to the nation from the building trades. From the details of the scheme, which are set forth on page 364, it will be seen that contributions in kind are invited, and that many offers of building materials of one kind and another have already been received.

Obviously, however, there are many thousands connected with the building trades whose gifts could not possibly take that form, and it has been suggested to us by the promoters of the scheme that the starting of **a Shilling Fund**, in connection with this journal, would probably provide an opportunity for sharing in the national gift to many who are not in a position to offer building materials or to send a substantial cheque.

We gladly fall in with this suggestion and invite subscriptions ranging from 1s. upwards, which will be acknowledged in our columns, and forwarded in due course to the Treasurer of the general fund.

By this means all who are in any way connected with the building trades—architects, architects' assistants, draughtsmen, students, builders, clerks of works, foremen, workmen and apprentices—will be afforded an opportunity of taking their share in the national gift. The Proprietors of the BUILDERS' JOURNAL AND ARCHITECTURAL RECORD will start the list with a donation of **One Thousand Shillings** (£50).

Many of our readers have no doubt already contributed to one or other of the funds that have been organised for the benefit of our soldiers or their families, but we venture to hope that, if only by sending us a shilling postal order, they will take some share in this special and distinctive gift, and thus help to make it thoroughly representative of the building industries of this country.

Contributions for our Shilling Fund should be addressed to

SOLDIERS' HOMES FUND,
BUILDERS' JOURNAL,
Effingham House,
Arundel Street,
London, W.C.

Further details will be announced next week; meanwhile we invite correspondence on the subject from our readers.

Art in the Painters' Guilds.

SINCE in point of date they come earlier, the Flemish paintings at the New Gallery should be seen before the Van Dycks at Burlington House. To many they will be more interesting, and it would be a pity indeed if a collection made and arranged with such care should be overlooked. The South Room containing some rare and unique examples of English art at its best must be left for others to notice, while we talk of what painting there was in Belgium when painters, without exception, were guildsmen. A compact and scholarly paper by Mr. J. H. Weale on "Early Art in the Netherlands," introduces the subject and makes the catalogue itself of some value.

If the paintings, the critic must see, were reckoned in miles, there would then be some thousands on record; if in numbers, as many millions; and the consequence is that he feels every day less inclined to elaborate a description of any particular painting. If anyone were to give me such a thing as a little panel (No. 2 in this gallery) so that I could be alone with it during some part of each day, that would indeed be a different matter, but here with hundreds of paintings to talk of, and as many more to be seen, I can only say briefly and generally what attracts me to the arts of this period. It may seem that much of the work is mechanical, *naïf* to the point of absurdity, too assiduously laboured, and too realistic to approximate to one's ideal; all this may be said, and some more, while yet it remains most wonderful. A little knowledge of the conditions under which such things were produced, although nothing to boast of, is in fact indispensable, and thanks in this case are due to Sir Martin Conway for the chapter on the "Guild system" in his book on these artists. "The provinces of Flanders and Brabant were famous for their wealth throughout Europe." In the fifteenth century buyers and sellers from every land reverted to Bruges for their trade. "The representatives of twenty foreign princes dwelt within the walls of this capital of the rulers of Burgundy, at the cross-roads of the highways of the earth. Ghent, Louvain, Mechlin, Ypres, and other neighbouring towns were vast manufac-

DETAIL OF CHURCH OF ST. TROPHIME, ARLES. (*See p. 365.*)

turing centres. Louvain could muster 150,000 men, and at Ghent the weavers' guild alone numbered 40,000 men." The mind is prepared by such pictures of opulent cities for what remains to be said of the institutions they fostered, and amongst them the painters' guilds. One joins such a body to learn what its traditions are, what standard of work is maintained, and how much of oneself is *de trop*. The note of this guild-craft is thoroughness as to the work, and conformity with current ideas of fitness in the manner of treating the subject. It is known, though possibly not by all, that there were rules for the guidance of painters which, as early, at least, as the twelfth century, were embodied in a work called "Hermenia," consisting of two parts, the first merely technical, a digest of recipes; the second of regulations regarding the manner in which a story should be represented. [*E.g.*, one of some hundreds, *Elijah raises the widow's son.* "A high house. On the top a bed in which the child is laid. The prophet holds the child by its hand, and breathes into its mouth, the mother standing behind."] Given any such story, it may be taken for granted that the manner of treating it was settled at a comparatively early date, or a book such as this embodying the rules of the church in such matters would not have appeared when it did. [The latter part of this work is contained in Didron's "Christian Iconography," which, translated by Margaret Stokes and published in 1886, should be known to the English reader.]

So much for the subject. Then as to the manner of painting, there was but one way—the best. A great deal of the earlier art of the Miniaturists can be discerned in the smaller works, the panel presenting a somewhat parchment-like surface. With the substitution of canvas for wood a new epoch commences. The term of apprenticeship to this craft of picture-making was hardly less than twelve years as a rule, so if at the end of that time the master and pupil seemed somewhat like parts of one whole, it is only what might be expected to result from such a close partnership. From generation to generation these traditions of craft descended, and remembering that all the art of the age was sacred, at least in its main characteristics, the fact that so many pictures are so much alike no longer seems hard to explain.

The craftsman's *Alma Mater*, the Guild, has been overwhelmed, it is true, but has only gone under, perhaps, and may turn up lower down. (By what signs shall we know it, and what name shall we give it then?) There are, at any rate, many who hope to see something like it again, and since the capitalists have revived the idea it seems to me that we shall. That the guild, like its modern successor the "Union," was a frightfully exclusive body, and that the independent worker lived in fear of his life, is not so well known as it should be. Although nothing from this point of view but an ordinary trade protection society, and particularly savage at that, it concerns us to know that it protected the craftsman so as to leave him free of his soul, and created conditions under which the best possible work could be done. If such was the "Guild," what, then, is the "Trust," the latest device of the capitalists, but an invention whereby the assumption of stability in a competitive system of trade is shown to be baseless.

"Combine" is the word on all sides; in this particular case Capitalists *versus* Consumers. It remains to be seen whether a capitalistic, *i.e.*, guild system will be as popular, and whether, like that, it will be abolished by statute. It may be remarked in conclusion, without intentional reference to the financial affairs of South Africa, that the Chartered Guilds were the richest, and, as a matter of course, the most tempting.

ERNEST RADFORD.

On Reflection.

The Building Trades and the War.

Amidst all the disagreements and discussions to which the South African war has given rise, there is happily one point upon which Englishmen of all parties are in complete accord, namely, the duty that rests upon us all of ministering to the needs of our wounded soldiers and of the families of those who have fallen in battle. There has hitherto, however, been a little danger lest the money generously and willingly provided may be expended in relief which affords a merely temporary benefit. The pitiful case of the permanently disabled soldier discharged from the army with a pension inadequate to supply even the barest necessaries of life has been overlooked. Yet there will be many such cases before the war is ended. We are glad to announce that to the Building Trades of England is to belong the honour of repairing this serious omission. A strong committee, with Mr. Edwin O. Sachs, the well-known architect, as chairman, has been formed to secure the erection of Homes of Rest for discharged soldiers on a freehold site at Bisley generously given by Lord Pirbright. An interesting feature of the scheme is that contributions in kind are specially asked for; those of our readers, therefore, who are in a position to offer gifts of building materials, finished joinery, fittings and appliances likely to be suitable for the purpose will, we hope, lose no time in making their intentions known to the organisers of the scheme.

Details of the Scheme.

It is proposed that the gift shall take the form of the erection and equipment of six cottage homes, comprising in all one hundred beds, together with the necessary offices and a large recreation room and workshop. These six homes will be known as the Building Trades Gift to the Nation. Much of the work in connection with the buildings will be carried out gratuitously, so that donors may be assured that their gifts will be devoted with the smallest possible deductions to the object for which they are intended. The management and maintenance of the homes will be in the hands of a special sub-committee of the Sailors' and Soldiers' Help Society — an excellent institution of which H.M. the Queen is patron. The administrative work, together with the construction of the homes, will be in the hands of a small executive, comprising the originator of the gift, Mr. Edwin O. Sachs, acting as chairman, Mr. Fred. R. Farrow, F.R.I.B.A., Mr. F. Hammond, F.R.I.B.A., and Mr. Ellis Marsland (District Surveyor), with Sir John Taylor, K.C.B. (H.M. Office of Works), Mr. Thos. Blashill, F.R.I.B.A. (late Architect of the L.C.C.), and Mr. Arthur Cates, vice-president R.I.B.A. (late Crown Surveyor), as advisers. An influential body of stewards representing the donors includes such well-known names as Mr. J. Randall, President, Institute of Builders, Mr. J. Howard Colls, Mr. George Jennings, and Mr. Sam. Waring. The correspondence in connection with the gift will be dealt with by the executive at the offices of the British Fire Prevention Committee, who have lent their reading-room for this purpose, and all offers of contributions, &c., should be addressed to "The Executive of the Building Trades' Gift, 1, Waterloo Place, Pall Mall." As we announce on the previous page, we have started a shilling fund in connection with this scheme, and are prepared to receive and to acknowedge in these columns money contributions from one shilling upwards. One interesting feature which will specially appeal to the building trades is the fact that when a selection has to be made for a place in the homes, preference will be given to men who have been engaged in the building trades prior to service with the colours, or who have been connected with these trades while in the reserve forces. We feel sure that no words are needed to commend the object of the scheme to all our readers, but it often happens that schemes admirable in their objects are marred in the carrying out. In the present instance we have no such fears; the names of those who are lending their assistance to the scheme, and the common sense, business-like principles on which its details have been devised are sufficient assurance that if the members of the building trades respond, as we feel sure they will, with alacrity and generosity, we shall soon have a valuable permanent addition to the benevolent institutions of this country, and a noble memorial of the greatest of British industries.

"The National Trust."

We have frequently had occasion to refer to the good work that is being done by "The National Trust for Places of Historic Interest or Natural Beauty." There have been times in our history when many buildings of architectural beauty or historic interest have been destroyed or spoiled by the accidents of war or the deliberate assaults of ruthless iconoclasts. But it may be doubted whether any period—even the most stormy—has witnessed so great a destruction as has been going on in these last fifty years of peace and progress. And if within the last two or three years there has grown up a new regard for historic buildings and scenes of natural beauty, and a juster sense of their value to the nation, it is largely due to the educative work that has been carried on by the National Trust. For a clear account of the origin of the Trust, the objects for which it exists, and the means by which it seeks to carry out those objects, we refer our readers to an admirably written article by Mr. Hugh Blakiston in the January number of the "Home Counties Magazine." Our forgetfulness or indifference in the past has sadly marred many of our cities and villages, and—as Mr. Blakiston suggests in a striking passage—it has left its mark upon the citizens themselves. "We see the lava stream of bricks and mortar obliterating the pleasant woods and fields; we see the smoke-laden fog replace the white morning mist, and dull the quick colours of life to the dismal hues of death. The gin-palace swallows up the ancient hostelry, plate-glass windows and facia signs take the room of latticed casements and over-hanging eaves; monstrosities in terra-cotta flaunt their meritricious charms in exchange for the dignity and repose of manor house and castle. And we ourselves grow daily into the likeness of the work of our hands, until a stroll through the suburbs of a great town becomes a night-mare of meaningless design and purposeless faces, complementary the one to the other." To restore the waste places and bring back the vanished sweetness and beauty may be impossible, but to preserve the beauty that yet remains is the worthy task in which the National Trust is engaged, and it is one which must command the sympathy of all but the most hopelessly mercenary spirits.

The Study of the Human Form and its Influence on Architecture.—II.

BY A. R. JEMMETT.

(Continued from page 334, No. CCLVI.)

ALTHOUGH great importance has been attached to drawing as a method of study, it is not the intention to assume that nothing can be learnt from the human form by other means. To be conscious of the presence of a beautiful object affects the taste. To let the beauty of nature sink into our hearts purifies the emotions and idealises the mind. Inspiration may be derived from a sunset, although the precise forms and values of the colours are not noticed; so, too, from the human form. But this unconscious, unthinking enjoyment is not sufficient for the artist. If he wishes to produce creations that will awaken like emotions, he must do more—he must observe accurately. By recording on paper the results of his observations, he is able to compare them with the original, and to correct them till he gets them accurate.

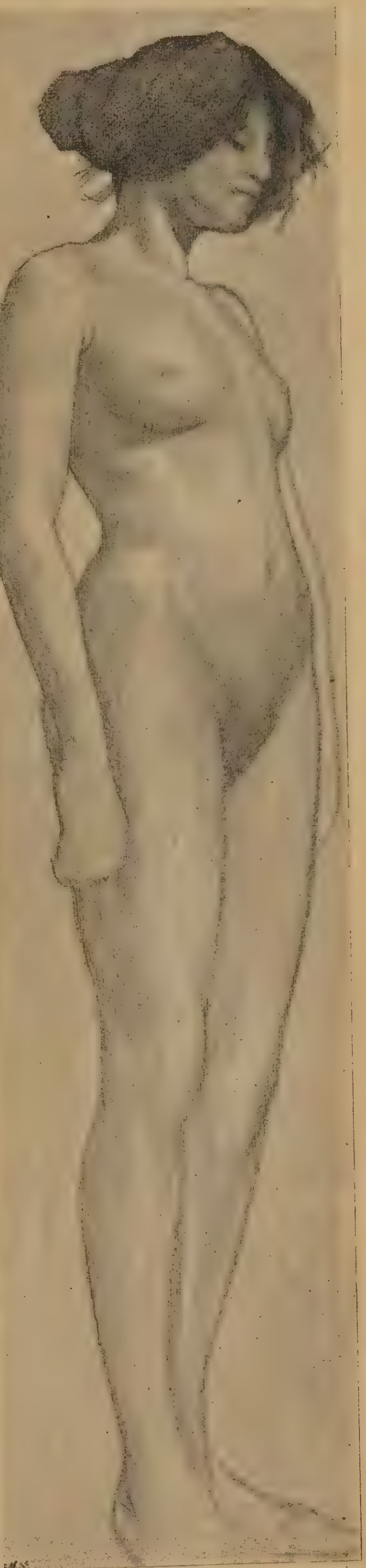
A THREE HOURS IMPRESSION OF THE GENERAL EFFECT. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

We often hear figure drawing spoken of as a special sort of drawing, a separate art in itself, which the architect cannot be expected to practise. It seems to be assumed that he draws well enough in his own way, but he does not happen to draw the figure; like a man who plays the piano, but does not happen to play the violin. This is hardly the right way to look at it. There is only one process of drawing, whatever subject it may be applied to—simply the process of putting things in their right places, whatever they may be. The differences in drawing different objects are really differences of method in recording our observations, differences of technique, of manual dexterity, which may vary according to the materials employed and the object to be drawn; but the real mental process is the same for all.

Again, it is often said that the man who can draw the figure can draw anything, *i.e.*, everything. If we state this proposition inversely we express the wider truth, that the man who can draw anything can draw the figure. This does not seem to be so generally realised. If figure painters are, as a rule, better draughtsmen than other artists, it is because a higher standard is required for practical success; there is a higher standard of popular criticism. To draw a head to pass muster requires a greater power of draughtsmanship than to do the same for a tree. The width of a line makes all the difference in a face, but it is not so noticeable in a piece of drapery. Few people have any enthusiasm for drawing for its own sake—as an intellectual exercise. Most of us are content to draw as badly as public opinion will allow, as well as is necessary for practical success, and no better; so that unless a man has a practical necessity to draw figures, the chances are he will never take the trouble to learn to draw well enough. So that it might be said that the man who cannot draw the figure shows thereby that he cannot draw anything else of equal difficulty, and there are things of equal or possibly greater difficulty.

Take as an example certain architectural details of the finest Greek period. A group of horses from the frieze of the Parthenon, a Doric or an Ionic capital of the same period, these are probably as difficult to draw as any figure, if we would give them style. The man who traced the capital of the Parthenon was a consummate draughtsman, as great as he who drew the Madonna di San Sisto, or he who painted Philip IV. We are led therefore to this conclusion that, if we can draw architecture as it has been drawn, and as it should be drawn, we can draw well enough to draw the figure; conversely, if we cannot draw the figure, we cannot draw well enough to draw architecture as it has been and as it should be drawn. Until we can draw as well as the designers of such buildings as the Parthenon, we shall never be in a position to produce works of equal merit.

The movement that has grown up of late years for a more direct return to nature, questions the value of the study of the antique. This attitude has its dangers for the architect, if not for the realistic painter. The architect is not simply concerned with the types and individual characteristics of the men and women he sees around him, careless whether they be good or bad. It is not his ultimate business to represent them. He has in his mind, as well, the perfect form as nature intended it, and as it is sometimes possible to obtain it when the conditions of life are favourable. The conditions of modern town life are not favourable, but the life of ancient Greece was, in its Golden Age, and the sculptors of that time observed it with incomparable intelligence, and rendered it with incomparable art. Therefore the study of their works widens our view and helps us to realise what Nature intended by a man, not merely what civilization has made of him.



A THREE HOURS STUDY. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

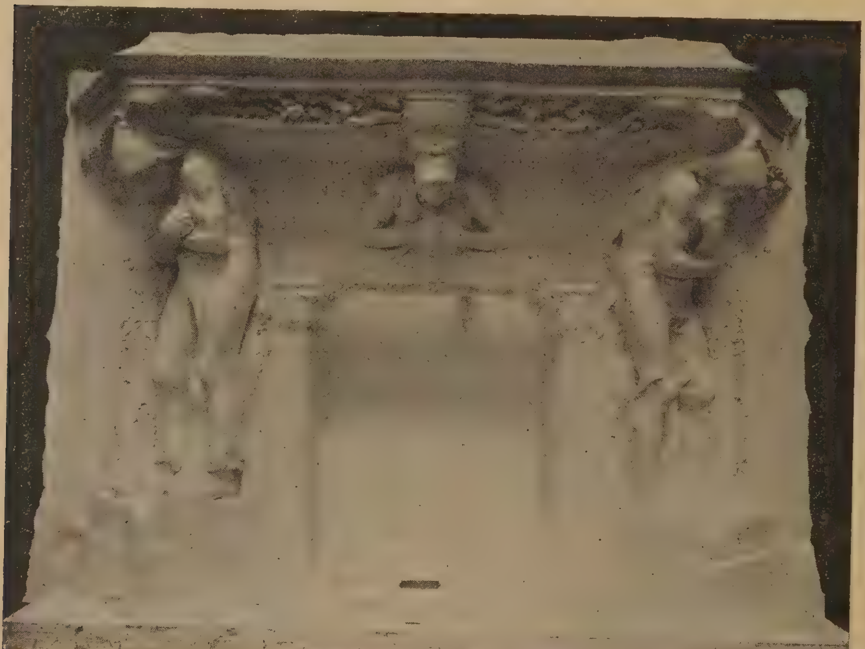
SILHOUETTE OF NOTRE DAME, PARIS. FROM A WASH DRAWING.

And, besides this, the Greeks evolved a type, a magnificent type. They, in a way, perfected nature; so that there is, for the architect, a special value in studying the ideals of so marvellously gifted a nation of artists.

For purposes of drawing, the antique presents many facilities to the beginner. A statue stands still, and for as long as may be desired, and so is of great assistance in overcoming the elementary difficulties of drawing and in acquiring a rudimentary knowledge of proportion and construction. The antique should, then, be studied first, so that we can go to the life with some knowledge and a greater power of draughtsmanship. For a living man is a different thing to a statue. He presents a different and far more difficult problem. Theoretically his form is always changing, either ripening or decaying. He varies from day to day, and hour to hour, influenced by health, fatigue, and temperature. He cannot remain absolutely still; he must breathe. Few are the poses in which his movement is unnoticeable, into which he can return again when once he has moved, or keep for more than an hour at a time. It is necessary, then, to be able to set up the complete figure correctly before it changes; to seize the leading lines that characterise the pose, that give the equilibrium, the action, and proportions. This power is more easily and quickly acquired from the antique, and, until it has been acquired, it is, perhaps, a waste of time, as far as drawing is concerned, to work from the life. For every single pose of the figure is a complete design in itself, of which no part can be altered without affecting the whole. If, then, it is not seen as a whole, and the essential points grasped and recorded at once, the drawing will never possess organic structure or coherence, and will never seem to live. It must be remembered, also, that no individual figure is perfect, and that it is very rare to find one equally and harmoniously developed. For this reason it is not good to draw too often from the same figure, or from the same type of figure; on the contrary, it is well to draw from as many different figures as possible, and to be always comparing and generalising. To be possessed by one type of face and figure, as some painters seem to be, suggests a limited outlook and imperfect sympathy.

For the same reason it is well to draw figures of both sexes and all ages, men, women, and children, to try and understand humanity as a whole. The male form in its perfection is, perhaps, the finest study, the grandest in construction. But, though "the noblest study of mankind is man," the most fascinating study is woman.

Every individual living figure has a distinct character and sentiment of its own—that is what we want to feel and express; for if we can feel the natural and individual sentiment of every figure, we shall more easily give the natural sentiment to every building. It is necessary, once and for all, to avoid false and affected sentiment. It is fatal. It is no use to try and draw the model with any particular sentiment that we may chance to admire. We do not want to try and draw like Raphael or Rossetti, or anyone else; we simply want to draw the model as it is, and to give it its true and characteristic sentiment. The architect has two things to do, first to study nature, and then to re-create on the same principles. When we are drawing from the life, we are studying nature, not designing; we have therefore express nature, not ourselves; when we design is the time to do that. There is so much more in every figure than any of us is ever likely fully to grasp and express, that if we consciously draw in any affected manner, other than that naturally suggested by the figure, we prevent ourselves from seeing so much we might otherwise have noticed. The more we express ourselves, the less we express nature.



BAFFIER-CHEMINÉE.

SILHOUETTE OF NOTRE DAME, PARIS. FROM A WASH DRAWING.

Conscious efforts to draw artistically defeat themselves. It is better to think more of the beauty of nature than the cleverness of our own drawings. If we really do feel the individual character, the natural poetry of the figure before us, and set ourselves with absolute sincerity and self forgetfulness to draw it as in itself it really is, the style will grow out of the subject in hand, and its natural sentiment will unconsciously appear in our drawings. All other sentiment in a life study is false, and therefore inartistic. The important thing for us is not what we think we feel or see in the figure, but what the figure really is; for we cannot reason from fancies, we can only reason from facts. If we do not see a figure as it really is, we do not see it right; we must train our eyes and brains till we do. For though colour may be a matter of feeling, form is a matter of fact.

It cannot be too often repeated that an architect studies Nature, not only to be unconsciously influenced, but also to understand it, to see into it as far as he can, to try and discover its principles. The drawings he makes for this purpose are simply records of his observations, and beyond that have no permanent value. They may, incidentally, betray artistic feeling and insight, but that is not the purpose for which they are made.

If, then, the architect's ultimate aim is not to paint like Velasquez, nor model like Donatello, neither is it to draw decoratively, with an exalted sentiment, like Raphael.

Within the scope of these articles it is not possible to more than indicate why, in one's own opinion, this subject is worthy of the architect's special attention, and in what spirit, what attitude of mind, he should approach it. It is impossible to discuss with any fullness many points in the human form of particular interest to the architect, and from which he can draw important inferences. The construction of the figure, its equilibrium, its silhouette—of peculiar interest in our misty climate—the various methods of study, such as modelling and painting, the application of descriptive geometry, and the scientific projection of shadows; true elevations of the figure, as distinct from the ordinary life study, which is a perspective view; the value of the Röntgen rays, as showing us the living skeleton; the question of drapery and its proper use and application, from an architect's point of view. Such subjects as these would require an article to themselves; here they can be no more than referred to in a general way.

Neither is it easy to say how far this study should be carried. It is a question for every man to settle for himself. So long as he feels that he is widening his sympathies and his ideas, so long may he pursue it with advantage. An architect can never know too much, provided he has the strength to carry his knowledge; neither can he ever draw too well; and as far as the subject is concerned, he need have no fear that he will ever exhaust its possibilities or interest.

But however far each man may elect to follow it, for the sake of its influence over his mind and taste, there is, for practical purposes, a great value in acquiring the power to set up broadly a possible figure from knowledge, in any required position. For, when figures are introduced into a building, they become as much a part of the general composition as any other detail, and their scale and arrangement require to be studied in relation to every other part, by the designer of the whole conception. As a consequence, all other details have to be studied in their due relation to the figures, which is not possible unless the figures can be put on the drawings precisely in the same way and with the same ease as any other feature. It does not seem conducive to harmony of effect to design part of a composition, leaving blanks here and there to be filled in by another man, who probably does not enter into the spirit of the thing; neither is it easy to leave spaces of the right shape and size unless we know how they are going to be filled; nor does it seem possible to foresee and realise the precise effect of the whole conception to make sure that the ultimate result will be harmonious; and where there is no harmony there is no art.

Owing to the fact that there is no one living school of thought in the plastic arts, but rather a thousand different cliques of sentiment, we do not find architects and sculptors educated together, holding the same ideas and breathing a common atmosphere. It is therefore most difficult to find a sculptor who can appreciate an architect's point of view, and who has been educated to understand the relative value of a figure in an architectural composition, or who is willing to sink his own personality to contribute to the general effect. This puts the architect in a difficult position. Either he must model the figures himself, which is not practicable—for if he can do this he must have neglected other things of greater importance—or he must be content with sculpture that does not exactly express his feeling and ideals, which, therefore, is out of character with the rest of the work—which does—or else he must do without it altogether, and this is, perhaps, the wisest course in the present unsatisfactory state of affairs, however much it may be regretted.

A TWO HOURS STUDY. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

In some other countries things are different. In France the architects study the figure as a matter of course. In the Beaux Arts the painters and sculptors have to know something of architecture, and the architects have to draw the figure and make designs into which the figure is introduced. This system has a tendency to foster a complete understanding between the architects, sculptors, and decorative painters. A notable example of this mutual sympathy is to be seen in the well-known group by Carpeaux in front of the Opera House. In this the sculptor has caught, in so happy a manner, the sentiment of the design, so entered into the spirit of the thing, that it is as if the same hand had drawn the architecture and modelled the figures.

But though the sculpture on this building varies greatly in quality, as is inevitable where so many different sculptors of different degrees of strength have been employed, the point to notice here is, that it is all of the same school, all more or less imbued with the same sentiment, and that the general result is harmonious. One shudders to think what would be the result of a similar undertaking in this country on so large a scale.

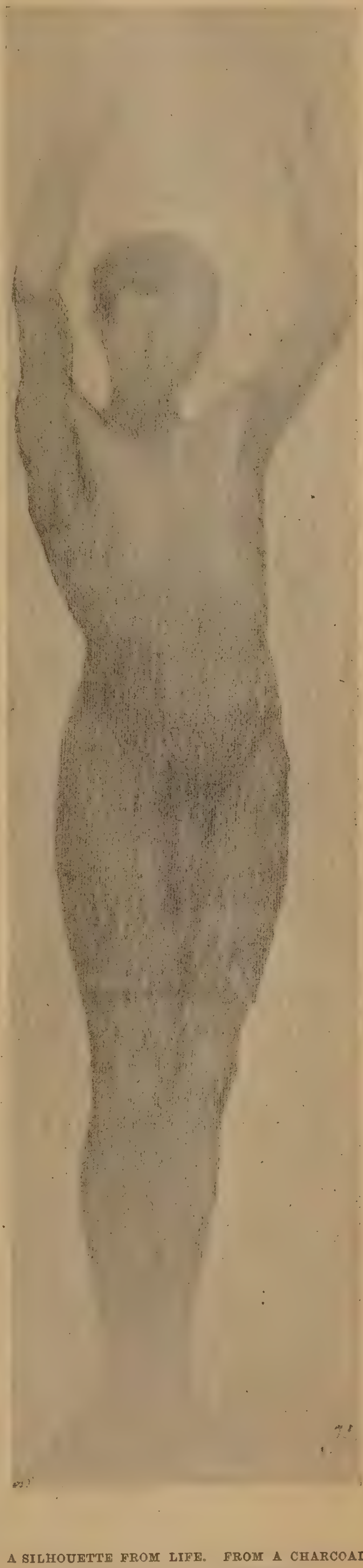
The study of this building, and of such works as the charming chimney-piece by M. Baffier, and the detail from St. Trophime, Arles, here illustrated, suggests how difficult it is to say where the architect's work ends and the sculptor's begins.

We shape the stone to whatever form we will, consistent with its nature; there comes a time when, from the intricacy or special character of the features desired, it becomes difficult to express ourselves by a drawing, easier to do so by a model; both methods are only means of expression; why should the architect be limited to either one? Again, there comes a time when features change from forms which are more easily developed geometrically, to those which are more easily developed by eye and hand; when plane surfaces and mouldings melt into foliage, and foliage into figure; when the figure becomes a part of the construction, and grows out of the foliage or purely conventional forms, in such a way as to render it impossible to say where one begins and the other ends. How is it possible to conceive such features without a knowledge of the figure, or to realise them unless the architect can draw or model? And why should it be considered advisable to draw such features as foliated capitals and other ornament, and out of the question to draw figures?

Although it is impossible, perhaps, for the architect in these exacting days to design and execute his own figure sculpture, yet it does seem necessary that he should at least possess sufficient knowledge to make him actually, as well as formally, the creator and director of the whole design; and sufficient facility of expression, to enable him so completely to convey his ideas to the sculptor, that the two men may work together as one.

(To be concluded.)

New Buildings in Leeds.—A large café is proposed to be built immediately above Wood Street, Briggate, from designs by Mr. Frank Matcham, London. The building is surmounted by a lantern tower, and the dining room is about 66ft. by 69ft. Two new Board schools are about to be built, one in Wintoun Street, the other in Lovell Road, plans of which have already been submitted to the Corporation. On the site of the old East Parade Chapel a block of buildings is to be erected for the North British and Mercantile Assurance Company.



A SILHOUETTE FROM LIFE. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"An architect must recollect that those who are to be moved by his buildings are not Greeks, Romans, Mediævals, nor Italians of bygone ages, but the people of his own time."—PROF. G. AITCHISON.

Our Inset Sheets. THE tower screen at Llantwit Major Parish Church, Glamorgan, is designed to separate the eastern (formerly the conventual church, now used for Divine worship) from the western church, which was formerly the parochial church, and is now in course of reparation. Llantwit Major with its surroundings is well-known throughout the archæological world, and the church is certainly one of the most interesting buildings in South Wales. The screen was designed by Mr. George E. Halliday, F.R.I.B.A., under whose care the work of reparation is being carried out. Mr. Halliday is also the architect of the church of St. George, Cwm Park, Rhondda Valley, South Wales, which was recently built by Mrs. Llewellyn, of Baglan Hall, at a cost of about £4,000, and will form the parish church of a new ecclesiastical district. The church contains a baptistry for total immersion, and seats 400 worshippers. The walls are built of blue pennant stone, with hard Doulting stone dressings, and the building is lighted by electricity. There is a handsome pink alabaster reredos, also the gift of Mrs. Llewellyn. "Ceannacroc," Glenmoristen, Inverness-shire, has been erected on Ceannacroc Forest for Mr. C. L. Orr Ewing, M.P. It is situated at the confluence of two rivers, at the head of a beautiful strath, and commands fine views. The house has been built of local stone, quarried on the spot, and finished with cream-coloured harling, with a few red sandstone dressings very sparingly used. The roofs are covered with red tiles and the half-timber work is painted dark green. Besides the erection of the lodge itself there has been a great deal of work in connection with stables and other offices, which have been carried out on a large scale. The house and all the offices are lighted by electricity. There is an ample water supply, and fire hydrants are provided without and within the lodge. The difficulties met with in carrying out the work were principally due to the distance of the lodge from the nearest steamboat pier—sixteen miles over a road not too good at the best. All the materials, except the rubble stone and sand, had to be carted this distance. The architect was Mr. J. K. Hunter, of 51, Sandgate, Ayr, and the contractors were as follows:—Mason and joiner work, Messrs. J. and G. Findlay, Glasgow; roofing tiles, Messrs. Woolliscroft and Son, Ltd., Hanley (sub-contractor, Mr. John Reid, Inverness); plumber work, Mr. W. Anderson, Glasgow; plaster work, Messrs. A. Calder and Sons, Glasgow; harling, Mr. C. Highet, Ayr; electric lighting, Messrs. Reid and Co., Ayr (sub-contractor, Mr. John Gordon, Glasgow); painter work, Messrs. J. B. Bennett and Sons, Ayr; grates and tiles, Mr. Thomas Main, Glasgow. Mr. James Watson acted as clerk of works for the greater part of the time. The architects for the new banking premises of the Yorkshire Banking Company, Ltd., in Thirsk, were Messrs. Francis W. Bedford and Sidney D. Kitson, of Greek Street Chambers, Leeds. The materials used are Farndale stone for the front, with red tiles for the roof. There are offices on the first floor and caretaker's rooms over. The fittings are of walnut. The contractors are: Messrs. Nicholson and Sons, of Leeds, masons and bricklayers; Mr. R. D. Ruecroft, Thirsk, joiner; Mr. J. Lindley, Leeds, plumber: Mr. T. Moore, plasterer; Messrs. Watson and Worsnop, Leeds, tilers; and Mr. A. E. Lister, Bradford, painter.

St. James's Theatre. ABOUT the end of this month, Mr. George Alexander hopes to open the "new" St. James's Theatre, for the interior has been entirely remodelled, and many features have been introduced to add to the comfort and convenience of the audience. By lowering the stage and the stall flooring some 3ft. it has been possible to provide both with a "rake" sufficient to give a good view of the stage from every part. There are now only two boxes, the Royal box and its companion on the other side of the proscenium. The gallery has been greatly increased by the addition of about a dozen rows of seats, providing additional accommodation for 400 persons, and a similar improvement has been made in the other parts of the theatre. For the convenience of the artists eighteen capital dressing rooms have been furnished, and the stage has now a depth of 60ft. The roof has been raised to a height of 74ft., the distance from stage to gridiron being 52ft., so that the scenery can be easily and expeditiously manipulated. Another feature of the front of the house is that separate cloakroom and bar accommodation is provided for every part of the theatre. The system of heating and ventilation is complete, fresh air being driven into the building and the vitiated air extracted by fans worked by electric motors. Along the entire frontage of the house a new glass awning has been erected for the protection of those waiting outside in wet weather The general scheme of the decorations, designed by Mr. Percy Macquoid, is based upon that of the transitional period between the reigns of Louis XII. and François I. of France. Red, green, and gold are the colours chiefly in evidence, and particularly prominent on the proscenium, upon the arch of which figure, in striking relief, the coats of arms respectively of Shakespeare and Arden on the right, and St. James and Dante on the left. A new act drop has been painted by Mr. William Telbin. The work of alteration and reconstruction has been carried out under the direction of Mr. Arthur Blomfield Jackson, successor to the well-known architect, the late Mr. C. J. Phipps.

Vandalism in Cyprus. THE following letter has been addressed to the Secretary of State for the Colonies on behalf of the Royal Institute of British Architects:—"Sir,—The President and Council of the Royal Institute of British Architects have had their attention drawn to two letters in 'The Times,' dated December 16th and 26th, 1899, and respectively headed 'Ruined Cities in Cyprus' and 'Vandalism in Cyprus.'" They are also informed that plans have been accepted by Her Majesty's Government for certain harbour works at Famagusta in connection with a tramway to Nicosia, in which the destruction of portions of the curtain wall of the fortified city is contemplated. The president and council respectfully beg that in the carrying out of any such works the fortifications and surroundings of this remarkable and almost unique example of an old walled city should remain intact. They venture to urge the great value of the place to the historian, the artist, and the antiquarian, as a picturesque monument associated with some of the most stirring events of the Middle Ages. In requesting Her Majesty's Government to reconsider their decision, the president and council would most respectfully suggest that the Custom sheds and railway works, to make room for which it is intended to destroy the portions of the curtain wall facing the old port, might be placed in the large tract of almost vacant land, nearly a mile in width, lying to the south of the town."

Polytechnic Successes. THE annual conversazione and distribution of prizes and certificates to students of the architectural and mechanical engineering classes took place at the Regent Street Polytechnic on Friday evening last. The past session has been a very successful one. In the building construction examination, South Kensington, out of 9136 students the first and second places with bronze medals in the Honours Stage, part 2, were gained by Polytechnic students. In the Honours, part 1, twenty-nine students obtained certificates in the Advanced Stage; one of the students was awarded the Queen's prize. In architectural design two excellents and two first class certificates, and in architecture six first class certificates were obtained by Polytechnic students. The architectural work is receiving additional attention each year. In carpentry and joinery the first Honours National Silver Medal, offered by the City and Guilds' Institute, and six out of the thirteen medals offered in the June and December examinations of the Carpenters' Company were awarded to students at the Polytechnic; as were also the first Honours National Silver Medal, the second Ordinary Bronze Medal, and the third prize, with Bronze Medal, in brickwork, and the third prizes and bronze medals in ordinary stages for the plumbing and plasterer's work classes. The School of Engineering has also been very successful. After the prizes had been distributed by his daughter, Colonel Robert W. Edis, J.P., F.S.A., congratulated the school on the success it had achieved. He emphasised the importance of planning in the construction of buildings, and mentioned that, though it was perfectly possible to fit the elevation to the plan, the reverse was very difficult and undesirable. An architect should always maintain his self-respect, and stand up for that which he felt was right, but he ought also to cultivate common sense and tact, and, while opposing faddists or those who had little knowledge of the subject they were speaking of, he should not forget that it was his duty to comply with his client's wishes, and not to build according to his own views. The great curse of the moment he felt was trade-unionism; he could remember the days when the architect and the builder, and the builder and his men, worked together harmoniously, and he knew the work was better done then than at the present time. Let those who were taking up architecture remember that they were writing a history; let it be well done. It may be mentioned that the annual subscription to the Polytechnic Architectural and Engineering Society (in connection with which meetings and visits are arranged) is half-a-crown.

An Old Well. A CORRESPONDENT writes to the "Standard" as follows:—"I saw it stated recently in one of the daily papers that in digging the foundations the Central London Railway in front of the for Bank of England, the workmen had discovered a disused well. This must surely be the same well that was curiously enough discovered exactly one hundred years ago. I have in my possession a small engraving by Rawle, taken from the 'European Magazine,' published by J. Sewell, Cornhill, June 1, 1800, of 'The Pump in Cornhill,' on the front of which is the following inscription:—"On this spot a well was first made and a House of Correction built theron by Henry Wallis, Mayor of London, in the year 1282.' Hughson, in his History of London, says:—'Near the entrance of the Exchange there is a cast iron pump of excellent spring water, erected by the patriotic contributions of the the Bank of England, the East India Company, the neighbouring fire offices, together with the bankers and traders of the Ward of Cornhill. The well over which it stands was accidentally discovered in 1799.' History repeats itself."

Explorations at Caerwent. SOME time ago we referred to the formation of the Caerwent Exploration Fund. The Executive Committee have just issued a statement of the work done during last summer. The excavations began on August 17th on a plot of three acres of meadow land in the south-west corner of the city. On the west side of this plot the city wall is continuous, but on the south side the wall is much decayed. This has, however, been traced by trenches. The rounded angle between the west and south walls was found to be comparatively well preserved, and the excavations here were extremely interesting. Trenches driven from the west wall revealed at least three buildings, one consisting of two rooms and, some 70ft. away, a large house consisting of a centre area or court surrounded by rooms on all four sides. Here two columns and a capital with good early mouldings of the Roman Doric order were found. The third house, having a hypocaust and a room with an apsidal end, was discovered to the north of the first-mentioned house. While these excavations were going on, Mr. Morgan, the village wheelwright and smith, and his two sons excavated the interior of the north gate, and revealed the two piers of the gate, the tops of which were only a few inches below the surface. The gateway itself had been blocked up later by regular courses of masonry resting on massive blocks of stone, one of which was a very fine capital. All the excavations have been fruitful in finds of the usual character, which are now arranged in a temporary museum in the village. Work will be resumed this spring, when the central area of the large house and the house on the north wall will be thoroughly explored. More funds are required, and donations should be sent to Mr. A. E. Hudd, 94, Pembroke-road, Clifton, Bristol.

RIGHTS OF LIGHT AND AIR.*

BY T. WALTER L. EMDEN.

(President of the Society of Architects.)

FOR some time I have endeavoured to bring about some amendment in the law dealing with questions of light and air, and the subject has been seriously taken in hand by the Society of which I am President. It is my desire, in the course of this paper, to show how great the necessity for alteration in the law is; and I trust also to show the remedy, and that it would not affect the rights of property.

It is the desire of my society to prevent or to do away with the opportunity of bringing freely (as can be done at the present moment) blackmail and improper actions, and also to prevent building owners running up buildings injurious to owners of adjoining property, without notice of any kind.

There has been considerable attention drawn at the present time to the want of High Court Judges to dispose of the actions brought during the current sittings, so that there shall not be arrears left over to the next. I am of opinion that not only could technical cases, such as cases of light and air, &c., be settled more speedily and equitably but with a small portion of the present expense by a Technical Court; and if the High Courts were relieved of this class of case (of which there are considerable numbers every sitting), the necessity for strengthening the Bench would probably be done away with.

One of the first difficulties is the question of the rights of property. A right to light and air or any other easement under English law is acquired by having had an uninterrupted use for a certain number of years, and becomes a right of the property. Now, in Scotland, and on the Continent where Roman law prevails, these questions cannot be made the means of blackmailing as they are in England. Now, I do not intend to propose any interference with the acquisition of rights such as are obtained under English law. No right would be lost by the remedy I have suggested. In many, and in fact a very large number of cases, it would be much better to describe many of these acquired rights as a theft of that which rightfully did not belong to the property which acquires it.

The present state of the law assumes that everybody knows it, and understands that if a gutter is overhung on to the adjoining premises, if a floor is supported on a wall belonging to an adjoining owner (even though he may never have seen or known that the floor was so supported) for a certain number of years, a right will have been acquired which will have to be reckoned with, often enough to the tune of very serious amounts when an owner wishes to deal with or rebuild his property. I have known cases where, through a party wall, and in more than one case through a wall belonging entirely to an adjoining owner, windows have been cut through above the roof, not only entirely unknown to the freeholder, who had let the property for a long period of years, but without the consent as also without the knowledge of the occupier or leaseholder. A law which allows all this to be done necessarily cannot be very perfect, and it hardly seems to me like a protection of the rights of property; but it is the law, hence its power for evil must be curtailed as far as the law has to be reckoned with.

To follow one of my illustrations a little further—A person who I will call "A" owned a house at the corner of the esplanade and a side street in a large seaside town. Some period after, a person whom I will call "B" erected a house in a side street adjoining "A's" property. It was desired many years after by the owner of the corner property to re-erect his premises, carrying them a floor or more higher than they originally were. Provision was made for the light and air of the adjoining owners of the esplanade, but as there was an independent wall belonging to "A" between "A" and "B's" premises, and the lights in the side street look out only to the back and front, no provision was deemed necessary. On pulling down the property it was discovered that a window had been cut through and put in by "B" between the two hips of "A," the building owner's roof; that is, through the independent wall of "A." When "A" proceeded to pull the independent wall down, it was found further, that although "B" had erected a wall from basement to ceiling of the ground floor, that above that height the wall was omitted, and support taken off the existing independent wall of "A." There was no record of any right having been given for either window or support, and so far as an examination of those who owned the property formerly was concerned, no information could be obtained of any notice having been given. The solicitors, in whose hands the property had been for a great number of years, had no information either that any right or permission had ever been asked or given, or notice received. Yet I take it that the side street owner, "B," was within his right to claim and to prevent the corner owner, "A," raising his building, and he did so, and also claimed and obtained the right to use the independent wall more or less as a party wall.

Now I would ask any common-sense man upon which side, taking these facts as correct, should the right of property lie? Upon which side had the rights of property been protected?

This is not a single case; there are scores of similar cases. I think while this case goes to illustrate my point, their numbers will prove the waste there must be by expensive actions, while the delays there must be when owners attempt to build are almost unlimited. There is hardly a building commenced in which some difficulty as to light and air does not crop up.

I do not in the remedy suggest alteration in the manner in which such rights are built up under the law. I hope that the remedy by preventing wasteful expenditure in lawsuits, if once brought about, would go a long way to prevent not only many of these infringements being sought after, but their being made a source of blackmail where they exist, and also preventing serious delays to the building owner (which delay is after all, the main reason why large sums were paid); to be stayed by an action for injunction is in many cases not only serious but often ruinous. I do not by my argument or this illustration, put it forward that there are no legitimate claims of light and air, because there are many; and equally on this side, the interference with rights of owners would be prevented and no one would be prevented from protecting their rights by the fear that the building owner (who possibly a wealthy man), will put them to all the expense he can, and at least to the expense of a heavy action.

The fact that notice must be given before building is commenced and that the case would be brought at once before the Technical Court, would in my opinion, and I think in the opinion of most people go a long way to prevent illegitimate claims on both sides of the question.

I will give you an instance with which I have become acquainted, and which will still further show the trivial nature of some claims set up, and also the delay and expense which they can cause.

In this case considerable improvement had been made to the surrounding property by the building owners, and a claim was made by the owner of a small property, which a year or two before the improvements would have sold for about £1,000 freehold. The claim of the plaintiff was no doubt right to the extent that his building would be affected as to light, and had he in the first instance put forward his claim he would have enabled the building owners to arrange the buildings in conformity with any line which had been settled. But the course taken was to allow the building owners to commit themselves thoroughly to the building operation and to wait until the full height at which any claim for light must be made was attained. Then the claim was made, and all the work done above the height, even before the injunction was obtained was eventually decided by the judge to be pulled down. I suppose the costs and expences were not less than £2,500 and the time occupied by the action eighteen months; but in this case the buildings were pulled down rather than buy the claimant's premises at an exorbitant price, which I am of opinion was the real object in view. That the building owners were allowed to proceed in front of the windows of the plaintiff with their work until the last moment and to do so in such a manner as showed conclusively the intention was to erect a high building, without a complaint which if made would have stayed the building owners, seems to leave but one obvious conclusion to be drawn. When building owners are thoroughly committed to a building such as this was, it is of course highly probable they will pay and pay high rather than be stayed in their work; but in this case if such was the object it failed, but as I have stated with a waste of £2,500 and eighteen months of time. This case is not singular, there are undoubtedly hundreds of them, and the waste and delay and uncertainty would total up to an enormous sum of money every year.

There being no means such as I have suggested there should be means under a Technical Court, by which notice can be given to all adjoining owners, as it is usual for these claims to be made only when building operations are observed to be proceeding, at all events where it has not been brought to the knowledge of the adjoining owners by a party wall notice or some other means required under the Acts dealing with building operations.

When notice is received from the claimant it is possible it is followed up by some little time being spent in negotiations, then if these fail, by an application for an injunction, all this probably occurring after the building owner is committed to his contract. Necessarily, in claims such as these, complicated by many drawings and technical questions, the judges cannot give a decision on the application for an interim injunction, and the case goes for trial, sometimes with and sometimes without the grant of the interim injunction; and from the date at which notice was first given for an injunction the trial will probably not be less than twelve months, and may not infrequently extend to eighteen months or two years.

Building owners and professional men will understand what such a delay means in the midst of a building operation, the difficulty with the contract and contractor, and the loss of rentals and of business, and will be able to estimate pretty accurately what pressure such delay bring to bear on the building owner to come to a settlement even upon terms which may be absolutely outrageous. Another and strong incentive to acquiescence in heavy claims, to avoid actions at law, is, that in order to try these cases it is necessary to bring a considerable amount of evidence before the judge and jury, all of which is expensive, and all of which must be met on the other side by experts and witnesses equally expensive, and both may fall on one of the litigants. I have known cases in which for the proof of one angle of light (which was only considered a minor portion of the case) something like eight or ten drawings had to be prepared with all the necessary copies, and what is even still more expensive, models of the building in question prepared also. In cases, the decisions of which are so uncertain as these decisions are, it is absolutely necessary to put in evidence of the most minute character, so that it shall be most thoroughly brought home to the jury as well the judge (the jury too, composed of men who have no technical knowledge) the exact value of each claim made. Now, on the other hand, this evidence, of course, would be entirely unnecessary in the event of the case coming before the Technical Court, where the true nature of the claims would be easily and speedily ascertained and dealt with.

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* Summary of a paper read at a meeting of the Sheffield Society of Architects on January 9th, 1900.

I think what I have said goes a long way to prove what the expense, difficulty, delays and uncertainties are in dealing with cases of light and air, and I think also sufficiently prove the necessity there is for some radical alteration in the law, while the advantage to be gained by determining these cases expeditiously and economically, are, I think, evident to all.

It is not a question of taking away any rights of property, but of protecting those who have rights from having them taken away, and those who desire to build from paying blackmail. The suggestion which is made for a remedy, is the constitution of a Technical Court, under the London County Council, in London, and under the Corporation in provincial towns and cities.

[Mr. Emden then gave the same details of the scheme as he gave before a meeting of the Society of Architects, reported in our issue for August 9th, 1899.]

THE DISCUSSION.

Mr. Holmes, in proposing a vote of thanks to Mr. Emden, said that they all agreed with the serious condition of affairs that arose in consequence of the delay that the law entailed. Sometimes, in endeavouring to protect the lights of surrounding property by writing to adjoining owners, they invited frivolous actions. He was in favour of such questions being brought before a local tribunal; but he was rather jealous about giving more power to municipal Corporations. He thought the difficulty might be got over by the establishment of a court consisting of legal and professional men.

Mr. E. M. Gibbs, in seconding the motion, was also of opinion that it would be a mistake to put the matter in the hands of the Corporation, who had probably quite as much as they could undertake.

Mr. Arthur Wightman said he would adopt a more drastic method of dealing with the question. Never, in the whole of his experience, had he known a case where a right to light and air had not been stolen or secured without the knowledge of the owner. He had never seen a grant of light and air by deed. His idea was that the law should be altered so that every man should have the right to build as high as he chose on his own land, subject, of course, to the usual municipal regulations.

Mr. Joseph Binney remarked that he would not have much confidence in the tribunal suggested by Mr. Emden. They would not get the collective wisdom of the Corporation, but the matter would be delegated to a committee or sub-committee.

The Chairman, Mr. J. Smith, did not see why they should not have a technical court, constituted of representative architects, surveyors and solicitors, having the right to call upon the Corporation for the use of the plans deposited for municipal purposes.

The vote of thanks was then carried, and

Mr. Emden, in reply, said his suggestion was that the Corporation should appoint the officers to deal with questions as they arose. They might have a solicitor or barrister, a surveyor and an architect to form a tribunal, the three being local men. They would work independently of the Corporation. He referred to the work of the Dean of Guild in settling building disputes in Scotland. He said those courts had worked well there, and he hoped to see such courts as he had referred to established in this country.

Correspondence.

PRICE OF BRICKS.

To the Editor of THE BUILDERS' JOURNAL.

BALHAM, S.W.

SIR,—Your expert "R. W. C.," on p. 340 of your issue for January 3rd, gives the price of stock bricks in London at per M of 1,200. I should like to know who has ever bought or sold bricks in that way. Also, what does prices "in London" mean. Is it (1) at merchants, wharves, (2) on the job, or (3) alongside in barges in London? Had his annual averages been those of the last mentioned, his list would have been intelligible and useful, and the more constant charges for wharfage, cartage, &c., could be easily added; as it is, the information given is not very valuable, and if your expert proposes to explain that he has averaged the above-mentioned three, the list will be of even less service.—Yours faithfully,

J. D.

CLEANING & PAINTING WINDOWS.

To the Editor of THE BUILDERS' JOURNAL.

BEDFORD PARK, W.

SIR,—I have read with much interest and pleasure the proposals of the London County Council in respect to the recommendations of the Local Government and Taxation Committee to make a series of regulations for the better protection of persons (especially female domestics) employed in cleaning and painting windows.

This is a subject which has attracted my attention for many years past, and being very much interested in the proposals above mentioned, venture to draw your attention to a detail in connection with the recommendations which, in my opinion, should be amended if the working of the regulation is to prove effective. The detail in question refers to the height from the level of the ground at which it shall be an offence to permit a person to stand on the window sill for the purpose of cleaning or painting the window. An examination of the newspaper reports of window cleaning accidents shows beyond all question that about three-fourths are due to persons overbalancing themselves whilst in a sitting posture, and with great respect, therefore, I suggest that the regulation should be amended as necessary in order to prohibit any person standing or sitting on the sill of any window for the purpose of cleaning or painting such window or otherwise for such purpose exposing themselves to unnecessary risk. I would further suggest, in order to avoid any misunderstanding of the meaning of the words in the proposed regulation "without sufficient support," that no support should be deemed by the authorities "satisfactory" unless the use of the means of such support be formally authorised by the London County Council by the issue of a special certificate to makers of special appliances.

I see it has been stated in the Press that regulations of a somewhat similar kind to those proposed by the London County Council have been in force for some time both at Glasgow and Edinburgh. Permit me, though, to state that although it is true that such regulations have been made in these cities they have never been enforced, and I fear that unless special measures are taken by the London County Council to rigidly enforce any regulations of the kind for London that, as in Glasgow and Edinburgh, the regulation will prove a "dead-letter."—Yours faithfully,

A. E. GODDARD.

SEWAGE PURIFICATION.

To the Editor of THE BUILDERS' JOURNAL.

DUBLIN.

SIR,—My attention has been drawn to a letter in your issue for January 10th from Messrs. Henry Ough and Sons, criticising statements made in a paper which I wrote for the Congress of the Sanitary Institute at Southampton last September, entitled "Sewage Purification without Filtration," which was published in your issue for December 27th.

The subject is such a wide one that it would be impossible to deal adequately with the observations of Messrs. Ough and Sons within the limits of a letter. If they would refer to an address which I delivered at the opening meeting of the Dublin University Engineering Students' Society, which was published in "The Surveyor" for December 15th last, I think they will see the way in which some of my figures have been made up.

Evidently the experience of your correspondents has been principally confined to country houses and villages, whereas my observations were primarily addressed to the purification of the sewage of large centres of population.

As regards country houses and villages, it is true that the cost of suitable installations involving precipitation and sludge removal is often heavy, but in this connection it must not be forgotten that, when the sewage is of a purely domestic character, biological treatment by filtration does not present the same difficulties as it does with town sewage.

I have had a great deal of experience in dealing with the sewage of country houses and institutions, and in these cases I think perhaps a simple system of surface or subsoil irrigation after preliminary straining is one of the best methods of disposal where the circumstances are favourable. In other cases, I have no doubt that biological filters would give good results, but my views on the subject of sludge have been fully expressed elsewhere.

I have had also a considerable amount of experience in dealing with the sewage of towns, more especially in the north of England, and it is in this connection that my calculations have been made. In all these cases the sewage is of a very mixed character, containing trade liquids of all descriptions. This class of sewage is far less amenable to biological treatment by filtration owing to the large percentage of inorganic suspended matter.

Messrs. Ough and Sons appear to think that a sum of 10s. 6d. per million gallons is a ridiculous figure to give for the cost of a chemical to take the place of a bacterial filter, but it must not be overlooked that this figure is given in comparison with the cost of filtering sewage which has been previously clarified by precipitation, as compared with the cost of purification of the same liquid by the addition of an oxygen carrying compound, such as nitrate of soda.

At Halifax, when we were dealing with 100,000 gallons a day for a period of four or five months as a demonstration, the actual quantity of nitrate of soda which we added to the liquid was half a grain to the gallon, and, at the rate at which we were purchasing the nitrate of soda, the actual cost was only at the rate of 6s. per million gallons treated.

At Northallerton, in Yorkshire, where we are dealing with the whole of the sewage of the town, amounting to over 150,000 gallons a day, the quantity of nitrate of soda required is greater, because the sewage is more domestic, and contains more organic matter. But even at Northallerton the necessary quantity does not usually exceed one grain to the gallon treated, which is equal to 12s. per million gallons. Taking an average of these two figures, you get about 9s. or 10s. as the cost of the nitrate of soda.

As regards the cost at Sutton, the figures given for the cost of precipitation and land irrigation, namely, £15 11s. 11d. per million gallons, is obviously inflated in some way, and cannot, I believe, represent the real cost. If the purification did cost any such sum, there must have been some great extravagance. Every civil engineer who has had experience of sewage purification ought to know that such figures as these are not fair ones to use for comparative purposes.

In making my calculations I have based my figures upon the estimates and reports of such distinguished engineers as Mr. James Mansergh, M.I.C.E., Mr. Santo Crimp, M.I.C.E., Mr. Baldwin Latham, M.I.C.E., Mr. Thomas de Courcey Meade, M.I.C.E., and Mr. Edward Escott, M.I.C.E.

At the request of the Editor of "SPECIFICATION," I have in preparation an article which will, I expect, appear in the next volume of that valuable publication, and in which I hope to give some further information on this subject.—Yours faithfully,

W. KAYE PARRY, M.I.C.E., F.R.I.B.A.

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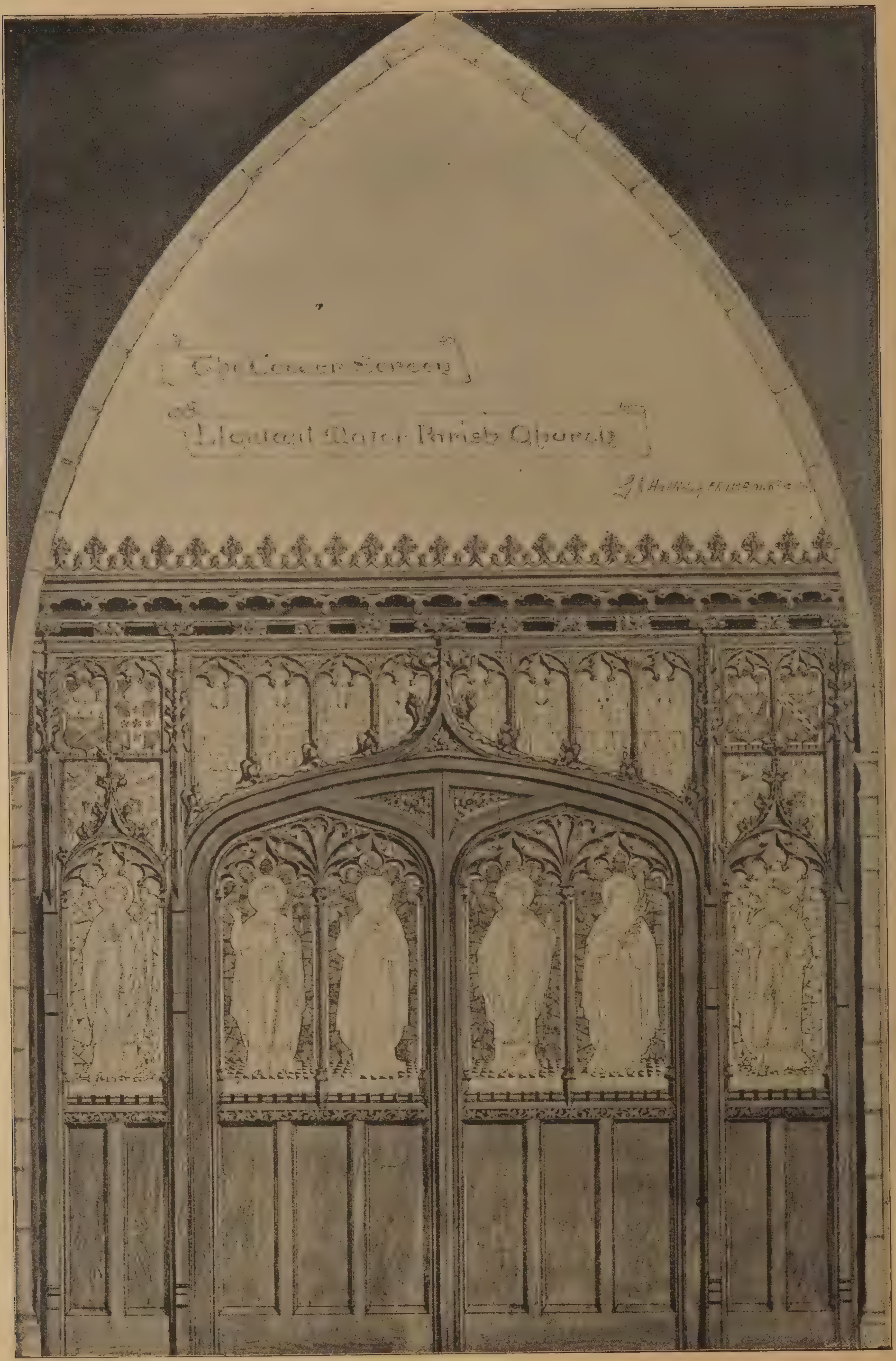

THE TOWER SCREEN, LLANTWIT MAJOR CHURCH, GLAMORGAN.

GEORGE E. HALLIDAY, F.R.I.B.A., ARCHITECT.

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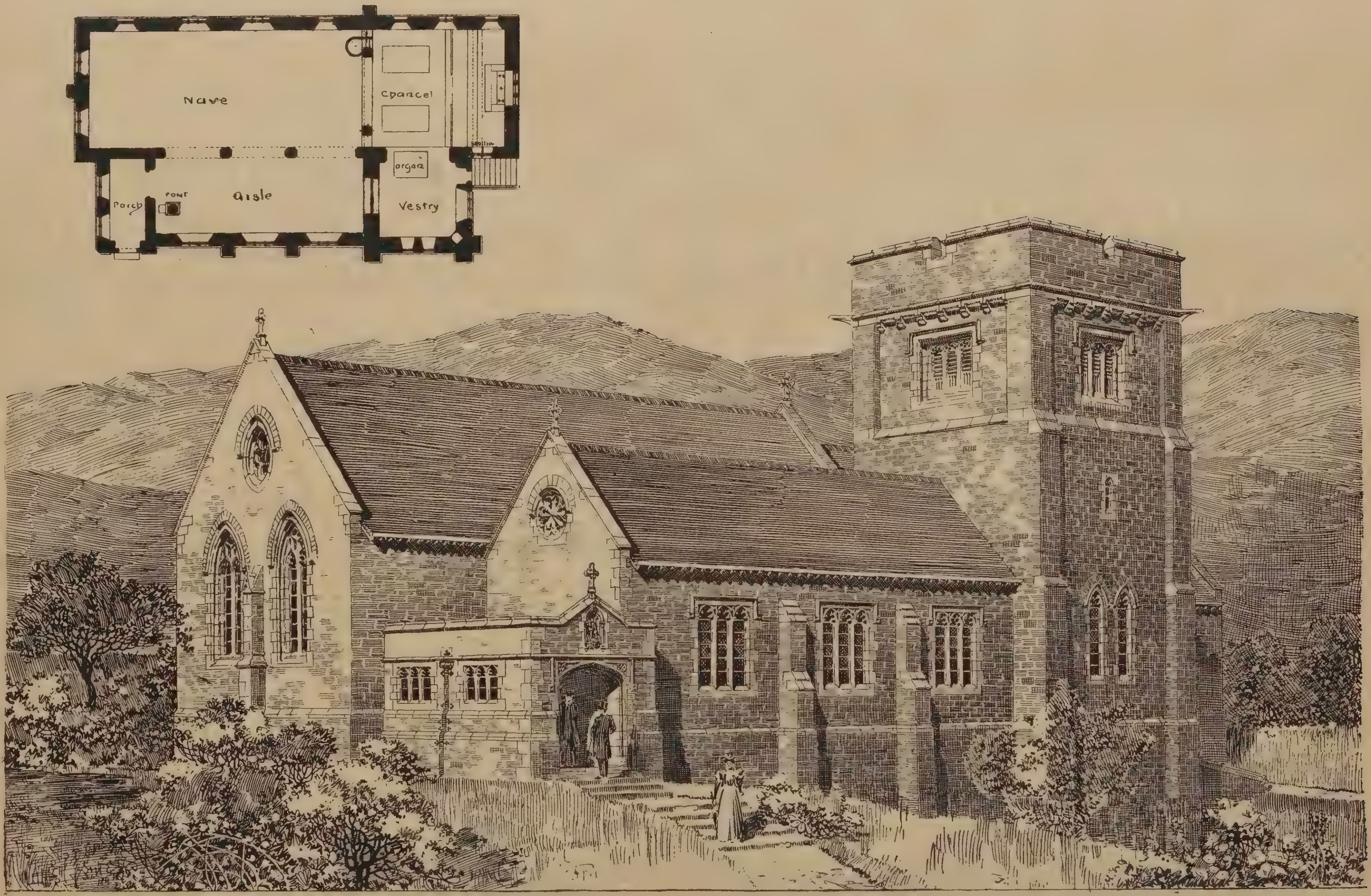

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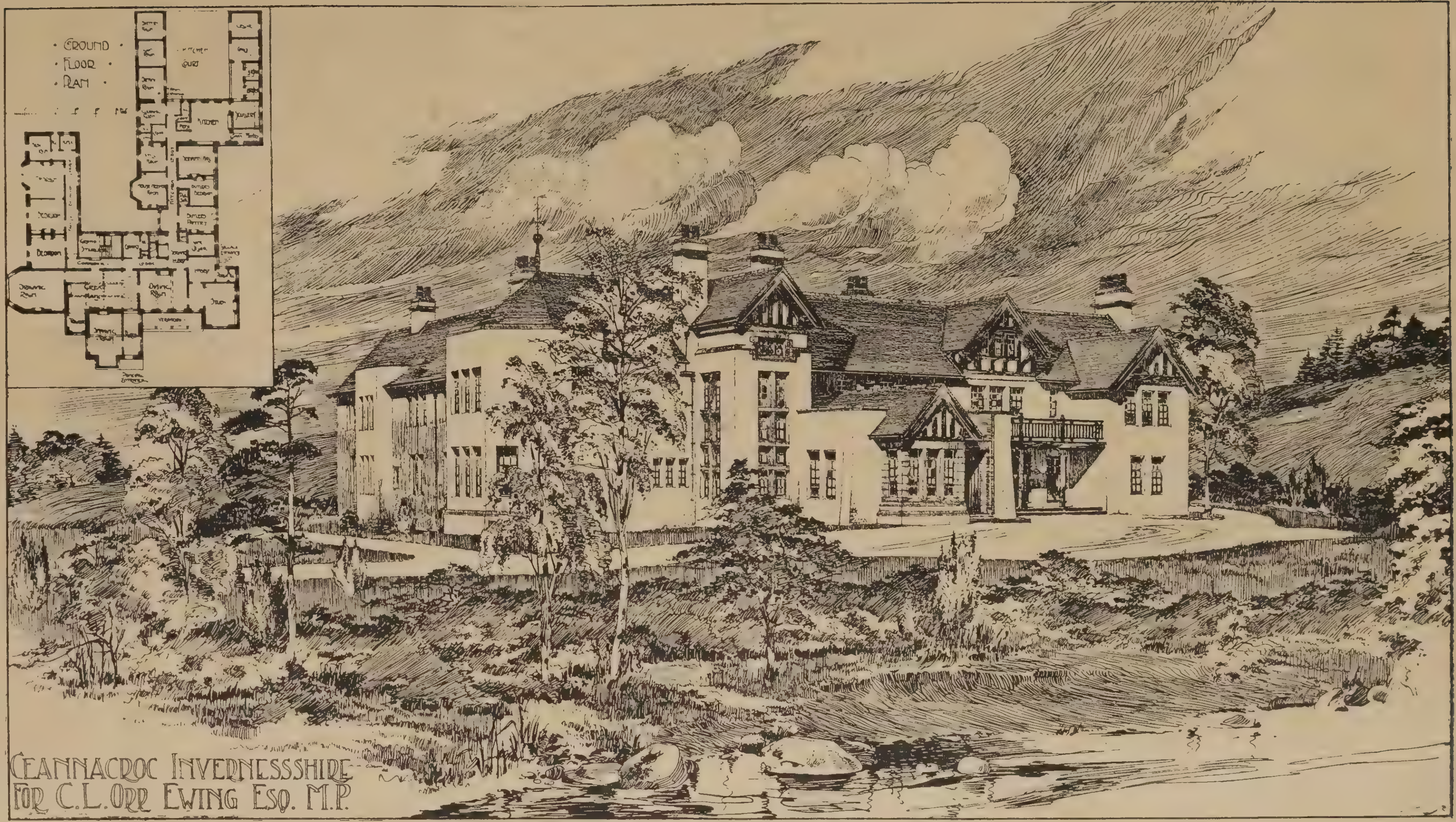

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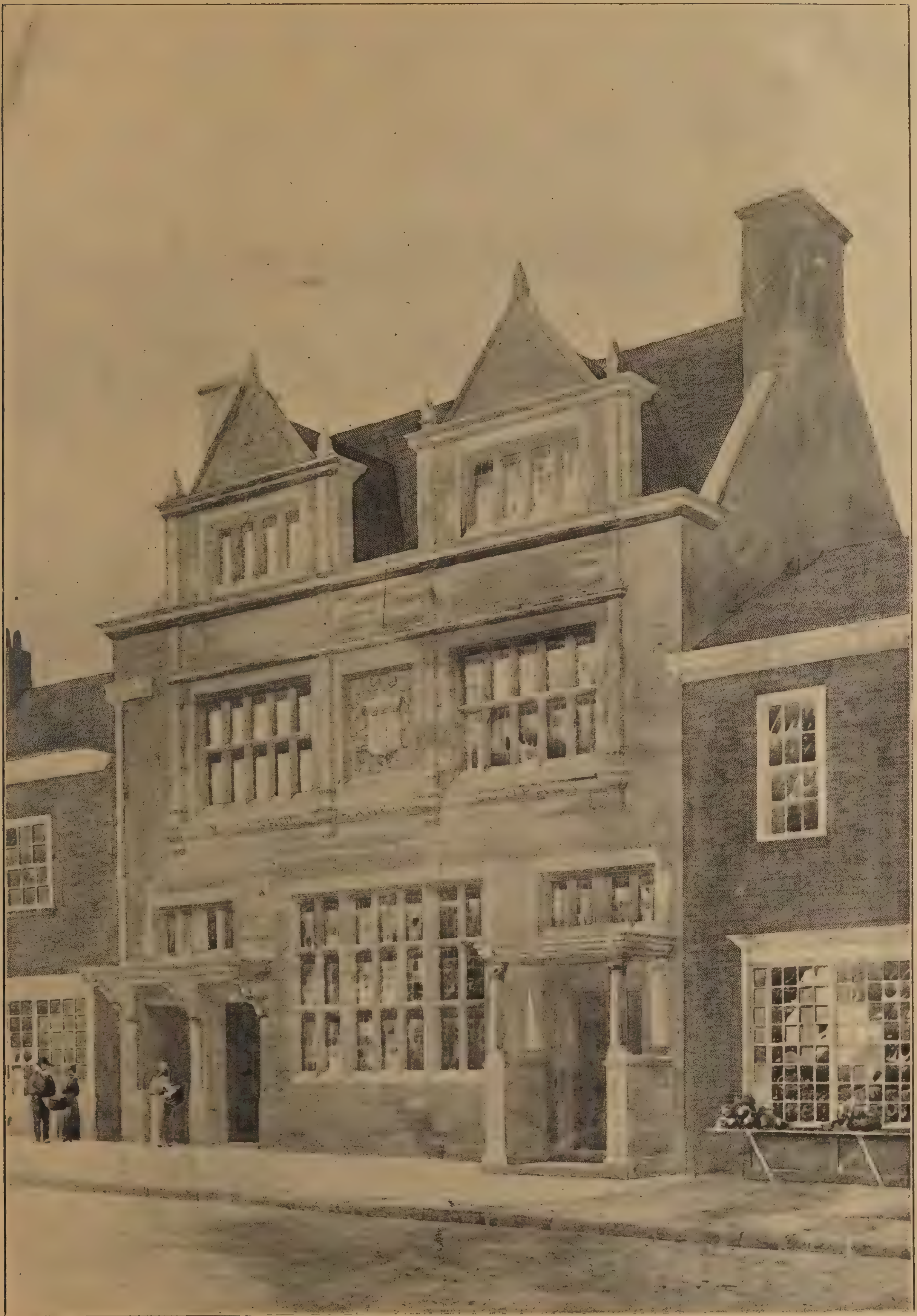

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ARCHITECTURAL ASSOCIATION.

THE DOME AS THE BASIS OF AN ARCHITECTURAL SYSTEM.

By ARTHUR BOLTON, A.R.I.B.A.

A MEETING of the Architectural Association was held last Friday at No. 9, Great Conduit Street, Regent Street, W., the president, Mr. G. H. Fellowes Prynne, F.R.I.B.A., in the chair. The minutes of the previous meeting having been read and confirmed, Messrs. L. W. Ensor, N. A. Leech and F. E. Lloyd-Downes were elected members of the Association. Mr. Bolton then read his paper on "The Dome as the basis of an Architectural System." The paper, which was illustrated with a large number of measured drawings and photographs, was as follows:

The object of this paper is to show that the Dome is not only the grandest of architectural features, but may be regarded also, equally with the vault, as the basis of an architectural system.

A tendency exists to regard the Dome more as an isolated feature, centralising in character, than as the expression of a principle of covering, capable, like the vault proved to be in the hands of the Gothic architects, of pervading the whole structure of the building to which it is applied—such a proposition might, I think, be deduced from a survey of the application of the dome in the buildings of more than one epoch, and from examples developed on very varying lines of plan. The requisite clearness of idea, however, can best be maintained by restricting our survey to one epoch, the Renaissance in Italy, and by further selecting two types, which I think may be traced in the churches of that period.

The considerations brought out, however, by the study of the examples taken are by no means intended to be confined solely to buildings of that epoch and character. If the idea of a definite principle in the use of the dome be granted, the further value of these examples will consist, not in the particular details characteristic of that period, but in the light thrown on the general problem of the structure, in an artistic sense, of such domical interiors.

Similarly, the restriction of the examples to churches only is an accident rather than an essential, a great development of such buildings having taken place in Italy simultaneously with a revival of interest in the dome as an architectural feature.

The modern dome is an Italian creation, and the numberless examples to be found in that country present the series of changes and experiments that mark the introduction of a fresh element in architecture.

With the spread of the Renaissance such studies were carried abroad, and two examples I have taken from Spain as witness of the wide interest to the problem of the application of the dome at that epoch. There is an unfortunate paucity of examples in this country, but the work of Sir Christopher Wren shows the influence of the movement, and though his work exhibits a preference for vaultings and flat ceilings, still singularly interesting results were achieved by him in the application of the dome at St. Paul's, St. Stephen's (Walbrook), St. Mary-at-Hill, St. Mildred, and at two other destroyed churches of a later type.

The duration and wide extent of the Renaissance movement, its composite character and divergent tendencies, render selection imperatively necessary, and difficult as is the task of suggesting lines of development, still the attempt is worth making, because of the interest and value that may thus be found in what would otherwise seem to be merely isolated experiments.

There is, moreover, no reason to suppose that the movement has exhausted itself, or that as the basis of modern European architecture, in a wide sense, it will yet be displaced for a long period. What has happened is that the special interest that was attached to the Order system, derived or associated with Roman architecture, has lapsed, and that consequently lessons may be drawn from a study of the buildings of the Renaissance independently of the customary architectural features and details of that period. In the fuller knowledge and interest of the present day in works of earlier epochs, it would be a mistake to regard Renaissance methods of treatment in matters of detail as the only ones suitable and expressive for modern, and particularly church, architecture on a domical basis. Nor, on the other hand, is it wise to refuse any merit or worth to any examples, either of an early or late date, owing to a comprehensive prejudice regarding their details.

What "building in a good Roman manner" meant to the Renaissance men is becoming mythical to us who have lost touch with a sentiment due, on the one hand, to a restricted knowledge of old classical architecture, and on the other, to the historical and literary associations connected with ancient Rome; while as regards the quarrel between the orthodox and the rebel Rococo School we are no longer concerned to take sides, but rather to appreciate whatever signs of progress we can detect even beneath a mask of detail that may seem oftentimes sufficiently inappropriate.

Working, therefore, on such lines as those traced out above, we can proceed to select for study two types, to be roughly distinguished as—*I. The Domical Church*, and *II. The Five-Dome plan.*

The first of these types is the result of the application of the dome as the system of covering to a settled form of church plan that had been handed down from the Middle Ages. That the common type of church plan, which is the result, mainly, of the Gothic system of vaulting, modifying previous structures popularly described as basilicas, should be equally affected by a new phase, such as the introduction of the dome, is only logical. It is a fact that may be briefly illustrated by one point only—a matter of primary setting out—such, for instance, as that the basis of the Gothic plan having been a nave of oblong bays and an aisle of squares, with the dome a square compartment, became desirable throughout. Though the nave of St. Paul's shows us that some degree of compromise on this point is possible, still this condition is one of radical importance.

If the test of style in a Gothic cathedral be, as has been suggested, that every part should be vaulted, so also in a domical building, the dome should be the chief covering agent. The first type, therefore, "The Domical Church," is one of peculiar interest as the study of the effect of the introduction of a new principle of covering to a settled type of plan, largely the outcome of a preceding system.

The second type, "the Five-Dome plan," exhibits the dome in its most characteristic development from the original simple sphere, covering a single apartment. In this form the chief dome is presented in a relation of contrast and proportion to its four satellites, while the originating idea of the cupola as expressive of space is preserved, according as the scale of the surroundings has been successfully calculated to enhance the main effect.

We shall find that the two types we have chosen to treat are often overlapping, for, obviously, a plan like that of St. Salvatore, Venice, is formed by repeating the five-dome plan, in order to obtain the length of a church of the common type, while S. Alessandro may be described as a compromise, being a five-dome plan with an eastward in place of the more usual westward extension. For the purpose of our classification, however, there is a sufficient distinction between the two types, as the five-dome plan is a geometrical form complete in itself, while the domical church is the outcome of the use of the dome as the covering principal for plans of the traditional type.

The subject of the leading domed churches of Europe has been so often and so well treated that familiarity can be assumed with the plans and treatment of the Pantheon, St. Sophia, St. Mark's, St. Peter's, St. Paul's, &c.; all the more, because in reality they are examples of another type, being mainly built as domes, in the sense in which the Pantheon at Rome is a dome; namely, a circular apartment whose effect is due to its spherical ceiling. While my object is to show the changes that result from the application of the dome, when used to produce a domed interior of a complex character, one in which the annexes contribute to, but are not sacrificed by, the special effect of a great dome.

In order, therefore, to deal with the subject in sufficient detail, I have set aside in addition to these great dome churches, the octagonal type also, which starting from Roman forms and the early baptisteries, passes through such phases as St. Vitale at Ravenna and Santa Maria Angeli at Florence, &c., to the developed form of Santa Maria Salute at Venice, examples resulting in the main from the addition of aisles outside the primary octagon.

Another type passed over is that of the simple Greek Cross, as Santa Maria Carceri at Prato (by Guiliano Sangallo, built in 1485-91), of which form numerous examples exist in Italy, as until the plan is enlarged to a square, by the angles being filled in and treated with minor domes, a line of development can hardly be said to have been started. In reality, the two forms, the Greek Cross and Five-Dome plans, are distinct types, with probably a separate, if related, origin.

The problems of vaulting left unsolved by the Romans found an outlet in that phase which we call the Gothic style, the essence of which as a vaulting system lay—firstly, in the device for roofing oblong bays by means of pointed arches, thus superseding the clumsy Roman methods of groins of elliptic and double curvature; and, secondly, in a special and continuous development of the rib as the feature of the vaulted covering. By Gothic analogy, therefore, that which seems to be necessary for the progress of a style is a certain emphasis of leading points, which will then pass imperceptibly through various phases, often returning in the end to the point of departure. Thus we see the rib running through a series of changes until, in the fan vault, it has sunk to a surface decoration, one of the points, in fact, from which it may be said to have started. Similarly, in a Domical System, we might expect that the problem of expanding the simple domed apartment of the Pantheon, on the lines of the complex type of church plan worked out during the Middle Ages, would lead to changes, both in the main characteristics of the dome itself, and also in the plan to which it was applied. Nave and aisles are crushed by the space of the dome pure and simple, and the problem took two shapes, one in which a great dome was the essential, and the surrounding parts were merely related to it, and served to enhance its value, and the other in which the dome is modified to the existing plan, and then becomes, as it were, only a new system of covering, possessing, as compared with the preceding, the effect of surfaces instead of lines, and of space instead of height and length. In such a process the loss might be great, the simple effect of a great sphere tending to disappear in the multiplication of parts; but the gain should be in the unity resulting from the universal use of the dome in all parts of the plan, and in a step taken towards the development of a complete system, as possible basis for a new style.

That the results of the first efforts were not a complete success does not mean that the problem was an impossible one, but only that the originators could not clear themselves at a bound from those Gothic traditions that explain the structural compromises of St. Peter's and St. Paul's. Half the interest of an enquiry into domical principles, and indeed into the architecture of the Renaissance as a whole, lies in the unsolved problems presented. Look at the internal treatment of St. Paul's. What a series of difficulties it admittedly reveals; but how little confidence do we feel that our age could have better solved the problem of its architecture.

Before proceeding to concentrate, therefore, our attention on the two types thus marked out—namely, "the Domical Church" and "the Five-Dome" plan—we must proceed to consider in a general way the special qualities of the dome.

The essence of the dome internally considered in spaciousness, and the majesty and harmony of covering a plan with its own section is most fully realised in the Pantheon at Rome. This effect, however, is accompanied by a lowness of proportion which, after the great height of the mediæval work, could hardly appear other than trivial. Moreover, the bondage of the circle is felt, and an enlargement of the diameter produces little extra grandeur compared with the actual increase of size. The first efforts, therefore, in the use of the dome are marked by a great height, which, though lower than the previous Gothic proportion, was soon felt to be intolerable, and the progress of domical building, as it may be traced in Renaissance examples, is a record, with some exceptions, of a continued reduction in height of the interior.

In working on such lines the Italian architects were often not hampered by external considerations, elevations being the exception, as their churches are often situated in the centre of blocks of buildings. Moreover, even when isolated, the practice of the Roman, and also, we may add, of the Italian Gothic, architects had accustomed them to a considerable indifference in the matter of external effect. It happens with us, possibly owing to the majestic grandeur of St. Paul's, that the dome has come to be thought of as a great means of obtaining external effect; but a people familiar with the Pantheon as their master-work might well feel the influence of the dome in a different way.

Hence, in this essay we can, for this and other reasons, discard external considerations, and treat the subject from the interior, as a matter of plan or section producing an internal effect, which, however, in any genuine architecture, would never be out of relation to its external appearance. Such considerations may be left as belonging to the future possibilities of domical architecture. From the point of view, therefore, of the interior we shall agree that height, a leading feature in the mediæval vaulted interior, is destructive of the effect of space, the special character of the ideal dome, and that the constant reduction in that proportion is directed towards satisfying a desire for spacious effect. The problem thus became that of ousting the Gothic influence as a step towards the formation of a new system, whose principle might be that all coverings are domical and not cross vaulted.

This tendency to absorb the dome as a roofing principle led to fundamental changes in its nature. Being brought into relation with the whole plan, it is transformed in size and character. Harmony of dome and nave is obtained by reducing both to one key, from which a complex plan arises, as the minor parts must be also covered on a domical system, if consistency of structure is to be obtained.

In a domical church the problem of adjusting nave and dome is complicated by the necessity of avoiding too great a contrast of height. For while in a dome pure and simple the whole of the surroundings are merely subordinated to a grand effect of space and height, the domical church by its length upsets the balance and destroys that special effect.

Given a long nave with one or two domes in its length, the resulting vista down the church presents serious gaps, due to their height, and to remedy this defect a complete change of character was brought about. The drum of the dome is first given up, then its section is lowered to a saucer shape, and finally it is amalgamated with its enclosing arches. This last process is based on the principle that every plane section of a sphere is circular, consequently the dome is no longer bounded by the enclosing square on plan, but these four arches are really sections through a dome of much greater diameter. We might say that the dome springs with the enclosing arches, and that the pendentives are abolished, being now, in fact, portions of the sphere itself. This particular process of domical treatment I propose to identify throughout as "the surface vault," being a term expressing something of its special effect. By this method a great reduction in height is secured, while the domical principle remains, and the effect is perhaps more characteristic than if, pendentives proper being retained, a segmental saucer be sprung from the crowns of the enclosing arches, which is the only other way of securing a similar result.

This absorbing of the dome as a system of covering may be usefully connected in idea with that characteristic of Roman plans, wherein walls of immense thickness seem to have had dug out of them the minor features of their exedras and recesses. I shall return to this point later on when dealing with St. Andrea at Mantua; here I wish only to draw attention to the analogous way in which the timid openings in the square piers of a Byzantine church, such as St. Mark's at Venice, are transformed into the minor compartments of the five-dome plan. In this there was a principle capable of expansion, for the dome is then carried on open piers related in covering to itself, like parts of a completely domical structure; as under the Gothic system, the cross-vaulted bay of the aisle responds to wider and loftier compartment of the nave. This may be said to be a departure of greater promise than that shown in the early form of dome church, as St. Andrea at Mantua, whose plan is that of one dome supported on the barrel vaults of nave and transept, and whose length is simply destructive of the main feature to which they are intended to belong. It was an advance in one way to place the Pantheon on to a vaulted hall of equal scale, but it was also spoiling both. It is a greater step to bring both into harmony, and this it was the main effort of the Renaissance architects to accomplish.

The problem, then, of the domical church is this relation of space and length, and it has been partially solved by a reduction in height. This was a gradual process owing to Gothic influences, and to a desire now and again predominating to obtain a commanding external effect. As regards the interior even, it may be conceded that the dome reduced to a surface vault, drumless and pendentiveless, loses something of its character, but the gain lies in the binding together of the parts, so that the great arches are of the dome, and the dome of the whole church, while by the introduction of minor domed compartments scale is obtained and the general system begins to approach the harmony of the Gothic scheme. It is not pretended that the forms described were new, as they may be found in Roman and Byzantine buildings; but that does not detract from the value of the work of the Renaissance architects, who were attempting to fuse them into a new system.

Moreover, Renaissance art, being essentially individual, examples cannot be followed out in that sequence we may find in mediæval architecture; but though some type may appear in advance, or be carried out with a knowledge and certainty beyond that of a work of almost the same date, still a general tendency can be traced with sufficient clearness, and may be followed up with advantage.

Many of the forms and features described may be traced, often crudely, in the studies of the first architects of St. Peter's, as given in Baron Geymuller's book on that subject. Thus Antonio Sangallo's "Study for a Nave" shows a treatment of domes on the surface vault plan which is highly interesting. One may, however, suggest a caution not to look at such sketches too much in the light of subsequent knowledge, or we may be attributing to their authors a more advanced skill than their work would have displayed had it been executed.

Type I.—The Domical Church.

We enter then upon the consideration of our first type, that of churches more or less completely designed on a domical system, after having cleared the ground by the foregoing preliminary consideration of some of the elements of domical architecture.

The church of St. Andrea, at Mantua, begun by Alberti in 1472, is remarkable in the history of art as the first modern church with a dome. The reason, however, for including it in this place is, that its system of enormous walls, within which chapels are, as it were, dug out, brings it into relation with the plan of carrying domes on pierced square masses, which has been already discussed. In St. Andrea the side chapels are arched over below the entablature, which carries a continuous barrel vault, and the pierced square, having only small doors of access, form no part of the internal effect. They are thus waste space in fact, while preventing any circulation outside the nave. These compartments, moreover, must be as high as the chapels themselves between, unless a minor gallery were arranged over them, somewhat as in the Jesuit church at Rome.

It is not too much to assert of this example that the plan is eminently one awaiting expansion, and that it possesses a high value as an originating work. St. Andrea is a church, moreover, which must be seen for its effect to be fully realised, otherwise it is hard to understand why it is one of the noblest of all the Renaissance churches, possessing some magic of simplicity and proportion, which affect the spectator with a dignity and grandeur that might not be appreciated from a mere inspection of the design on paper. In its enormous solidity of construction it is a direct outcome of the revived interest in the grandiose ruins of Rome.

The Carmine Church at Florence is an instance of a similar but reduced treatment of thick walls and a single nave. The supports in this case are smaller, and the chapels are made perhaps more useful in the general effect by their half-dome heads carrying up the eye to the main vault.

The æsthetic difficulty of the single span church is the tendency of the walls to lean outwards in appearance, and the partiality of the Gothic builders for arcades has been ascribed to a perception on their part of the correcting influence of curving lines. Consequently the treatment in this instance is a good example of what may be done in such cases, while the alternation of solid and void in good proportion is the probable explanation of the appearance of great size which the nave of the Carmine Church possesses.

St. Giovanni Battista, Pesaro (by G. and B. Genga, built in 1540) shows the other type of internal buttressing. The well-known church of the Redentore, Venice (1576, Palladio) has practically this plan, but masked by the use of the revived orders, the side chapels becoming the deep arches of a Roman arcade, from the Coliseum.

This digression on the simpler problem of the one-span church has its use in that our first type, "the domical church," is a derivative of the large hall, without however reaching a stage of greater development until, by the formation of aisles, the problem becomes complex. It is the call to adapt the dome and the traditional church plan that is responsible for the more interesting attempts that followed. There are in Italy and elsewhere a number of Renaissance interiors of the normal Latin cross plan without aisles, which most often are replaced by side chapel recesses. Such examples, though possessing a dome at the crossing, are not domical churches proper, but from them there is a development, perhaps best illustrated in Rome, in which these side chapels are enlarged to squares, and carried up for separate domical treatment, as in the Church of the St. Apostoli (by Fontana, built in 1702-24). Remarkable effects of lighting can be obtained, where these compartments are top-lit, but the general unity of the interior is broken up by such semi-isolated features. The great height of the bays of the side aisles of the nave of St. Peter's (1606-12, Carlo Maderna) shows an approach to this idea.

The plan of St. Carlo in the Corso (1612, Onorio and Martino Lunghi, architects) is as though such a series of chapels were thrown together to form a wide aisle in front of the usual chapel recesses, the passage way being carried right round the semi-circle of the apse. Each domed compartment is separated by bays, the width of the arcade piers, and in working round the apse the cupolas become oval in plan, while the separating bays are slightly radiating. As is well known, the application of the dome solves in the easiest way some of the problems of chevet vaulting.

It is worth while to mention this example when considering the subject of domical churches, because the wide aisle has been a subject of experiment in modern work, on account of certain advantages in seating accommodation, and it is conceivable that the domical idea could be well utilised in such a type of interior. The aisle question will be found to exclude large batches of domical examples of more than one period and style.

St. Salvatore, at Venice, commenced on a scheme by G. Sparento, approved in 1506, was carried on and completed by Pietro and Tullio Lombardo in 1534. It is the largest and most important of a series of studies in the application of the dome, the outcome of the influence of St. Mark's, and probably of other smaller churches in Venice of that period and character. The centre of St. Mark's was seen to constitute a complete conception in itself, and the expansion and development of the Byzantine model was followed out by the Renaissance architects in Venice—the square pier masses which in St. Mark's and other examples of the style carry the domes, are cut away to mere legs, leaving a good aisle on either side of the nave, but the treatment in detail is such as to retain their character as supporting piers. Internally they are domed either with surface vaults, as in St. Giovanni Grisostomo (built in 1497-1504 by Moro Lombardo), or have cupolas sprung from a string over the arches, as in St. Salvatore. These piers are the key to the whole interior, as a definite relation should exist between them and the main dome, both in scale of plan and in height of section. This is a consideration further dealt with in the second part dealing with the five-dome plan. St. Salvatore, though a small church, is remarkable for structural harmony and elegance, due, probably, to the almost exclusive use of the dome as a covering agent.

This church is supposed to have exerted considerable influence on St. Giustina at Padua, the model for which, by St. Alessandro Leopardi, was accepted in 1521.[*] On his death in the latter half of 1522 or beginning of '23 the work was continued, but it seems likely that changes, at any rate in the detail, were made. Andrea Morone, engineer, who was appointed in 1532, is responsible for the upper parts. There is a heavy and clumsy character about the work which it is difficult to associate with the architect of the Colleoni pedestal, and the mast standards of the Piazza at Venice, also works by Leopardi. It would seem as if the scheme of St. Giustina had been biassed by the designs for St. Peter's, founded in 1506; as though it were a compromise between the development proceeding in Venice, and the more grandiose ideas current in Rome. The defect of the Paduan church is that its length is obtained by the crude device of repeating the main dome three times down the nave, of the same diameter, but very much lower in height. The nave domes are divided from each other only by a single pier with narrow arch band. This pier is buttressed by an arcade across the aisle, and has the effect of a mere partition wall, while the central dome, though of equal span, has a compound pier and ample width of barrel vault to rest upon. This is an inadmissible distribution of the supports from an artistic point of view, the nave appearing too light in effect, while the crossing seems clumsy. There is, in fact, a want of unity in the plan, which may be broken into two portions.

The five-dome treatment of the crossing resembles that of St. Maria Campagna in that the four minor domes are shown outside, the resulting height producing internally a most well-like effect. This church is notable in that it possesses some degree of external effect. The west façade is still in the rough, but the nave outside is treated in what may have been the style of the Roman Thermæ, and being in simple brickwork is not ineffective, presenting perhaps an idea of what those great Roman buildings may have looked like, supposing that they were left unplastered.

The church of the Benedictines St. Nichola at Catania, is on very similar lines to St. Giustina, but is better worked out in detail. The division between the two domed bays of the nave is here much strengthened, while the single instead of double setting out of the side chapel is more in harmony with the scheme of the plan. This church is on a great scale, about 350ft. by 210ft., producing a striking internal effect with some perspective capabilities. Built 1558 to 1578 by P. Valeriano, of Catania, it was restored on the old lines a century later by Gian Battista Contini after an earthquake.

The Duomo, at Ferrara, is an old building modernised to the design of F. Mazzarelli in 1637 and carried on from 1711-28. It displays several features which illustrate the study upon which we are engaged. At once more complex and interesting than the other examples, built on an oblong site, lit almost exclusively from a clearstory, this building affords an instance of what may be done with a town church on an ordinary plot. There are three internal transepts, each marked by a dome, the intervening blocks being treated on the Gothic plan of oblong bays in the nave and squares in the aisles. There is, however, a minor difference in the setting out, for a kind of lateral perspective has been obtained in the plan of the piers, such as may be seen in Bramante's architectural background to Raphael's fresco of the School at Athens,[*] but which has not, so far as I am aware, been realised elsewhere. It is an effect especially suitable in a Renaissance church, on account of the stability that it suggests, preventing too many cross views, as well as that slender pillar effect which distinguishes a Gothic interior.

That this last point is a danger to be avoided in Renaissance churches is seen in the earliest examples, as St. Agostino at Rome, the cathedral at Pienza, &c. In such early instances the Gothic plan is merely clothed in classic detail, as in the piers which become four pilasters back to back, of inordinate proportion, in spite of the use of pedestals, owing to the attempt to reach up to the cross-vaulting at the usual level of a mediæval interior. Such an effort is not aided by the small rise of the round arch, as compared with that of the pointed form.

Returning to the consideration of the plan of the Duomo at Ferrara, an explanation may be due to those who are at home in vaulting problems, and who may be wondering how the oblong nave bays are ceiled. The groins are not ellipses, nor do they twist, but the covering is circular barrel vaulting, with intersections for the windows, the wall arches being run on to the main vault at the crown level, or nearly so; the half groins, however, are not in one plane, as the halves of a diagonal rib would be, the junction being concealed by the decoration. These wall arches, moreover, are sprung high up off the vault itself. Undoubtedly this is rather a trick, but, when one remembers the difficulties of roofing such oblongs with round arch vaulting, one can only be amused at the ingenuity displayed. The aisles are domed with surface vaults, adding much to the sense of apparent stability in this church. The lighting of the building is remarkable, proceeding almost entirely from the intervening blocks on their three sides, through a clearstory over the aisle, the domes being windowless, with a very good effect as regards the light and shade of the interior.

Unlike many examples, this of Ferrara has the advantage of conforming to the *doctrinaire* rule that the dome marks a resting-place, for here each distinguishes a transept, and is also a point from which seven altars are visible at once, being an effect sometimes arrived at in modern Roman Catholic churches, as in the crypt of the Sacré Cœur at Montmartre. This result is obtained by an attention to cross views not common in Renaissance interiors.

The question, however, of the impolicy of using domes at other than points of rest is really one of vista, it being assumed to be unpleasing to look down a series of domes; that is to say, it is the structural question of the dome section, for while domes of the pendentive and drum types are apt, by rising high above the enclosing arches, to make awkward gaps in the line of the covering; saucer domes and surface vaults are not so open to objection, being lower in section and more in harmony with the arches that contain them.

Undoubtedly, however, the question of vista is of the greatest importance. For instance, in this very example, on looking down the length of the nave, the three domes, or rather the two beyond us, occurring after the cross vaulting between, tend to leave the end arches of each block without apparent support. This effect occurs also in Gothic cathedrals whose crossing carries a lantern. In the latter case a remedy has sometimes been found in vaulting the crossing level with choir and nave, which, of course, at once extinguishes the problem. In this instance the use of saucer domes, or surface vaults, for these transept domes would have removed the effect of the gaps to a large degree.

Considerations of vista are also a reason for the level ridges of an English Gothic vault, in that the effect of length is best produced by providing a line for the eye to travel along, and that of the vault crown is one of those most naturally followed. In wooden roofed interiors, ridge rib and purlins effect the same object.

Ribs are not at first sight a promising idea in connection with domes, though there are cases, where the use of strongly marked ribs, as in St. Maria di Gradi at Viterbo, built in 1740 by Salvio Niccolo, carried up from the angles of an irregular octagon or other form on which the dome rests, still leaves something of the special dome effect, such as might not be entirely lost if a system of wide bands down the centre were used, leaving circles to occupy the spaces at the sides.[*] The introduction, however, of all ribs in domes, while often producing a ceiling of powerful effect, seems to destroy those special qualities of the sphere as a covering, which count for so much in the attractiveness of the dome as an architectural feature.

From the point of view of a domical church there is a certain imperfection in combining, as in this church, domes with cross vaults, one being a surface and the other a line treatment. St. Paul's presents a clever compromise in this respect, as in the nave the oblong bays are covered by saucer domes which rest on the cross arches at the ends, while on the sides they are supported by the groins of an interpenetrated cylinder. The defect, however, follows that the sides appear insufficiently supported by the thin line of the groin, as compared with the ends carried on the strong cross arches. The wreath band at the base of the saucer dome, while exaggerating the point, seems required to emphasise the cupola form.

The plan, however, of St. Maria di Gradi shows that the two cross-vaulted bays of the intervening blocks between the transepts could very well be treated as one composition, either domed with a saucer or covered with a barrel vault. Of this there is an instance in the Badia di St. Flora at Arezzo, built in 1550 (?) by Vasari, in which the treatment below the vault is as a Palladian bay of two free columns and a central arched opening carrying a small oval dome across the aisle. Emphasis is thus given to a side altar. The tendency to setting out in square bays, in domical work, is directly manifested in the greater harmony of the Badia scheme.

We shall conclude this part of our essay, dealing with Type I.—the Domical Church—by a reference to St. Fedele, at Milan (built in 1569-79, by Pellegrino Pellegrini). This is an instance of the application of the surface vault and a single span nave, bringing this church into comparison with those of St. Andrea and the Carmine, with which we started. It illustrates also how in the Later Renaissance a treatment of columns as orders on stricter Roman lines was attempted. In this instance the columns of the main order are used as vaulting shafts, as in the Thermæ, though with a closer adherence to rule than probably distinguished the works of the Romans themselves. We may consider this example as the model of the Madeleine, at Paris, though the covering in that case is by pendentives and top-lit domes. Aisles in this type can be obtained by bringing out the order free from the side wall, and covering the passage by a barrel vault from column to column, as in St. Quirico at Siena. A good abutment is thus obtained where the side walls are thin.

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[*] Osvaldo Parletti.

[*] Usually considered to represent Bramante's ideas for a St. Peter's, with a nave on the basis of a Latin cross plan.

[*] French Gothic vaults, where treated with English ridge ribs, produce a somewhat wavy effect owing to the rise and fall of the ridge, although this is not so noticeable as might be expected.

Second Type.—The Five-Dome Plan.

We now proceed to take up our second type, differing from that which we have been considering in this important respect—that the five-dome plan constitutes an isolated and self-contained building, and retains rather more of the original dome effect, possessing as it does a central and dominating, cupola-covered area. It is, perhaps, the most satisfactory development of the simple domed apartment of the type of the Pantheon, as it is free from the complications that arise with attempts upon an octagonal basis.

I have already alluded to the relation between these examples of our second type and the Byzantine model, as in St. Mark's, Venice, and also to the process of opening out the square supporting masses as minor domed compartment of the plan. The barrel vaults that bind these squares together agree well in idea with the main dome which they carry, being, in fact, only arches of an ampler width, insuring a greater sense of stability.

The system as a whole tends to lower the interior, as the pier compartments, as hollowed out, must not be too high internally, while the existence of much space above would call for an upper storey, also domed, such as, indeed, might well exist, in relation to a system of internal galleries of a structural character. In St. Salvatore the space above is disposed of as a panelled attic, the lines of which range round the whole interior.

In applying the classic features to this type of plan, the legs of the piers become naturally the main pilasters, enclosing a minor order carrying the small arches of the internal dome, this treatment agreeing well with the ideas of Bramante and Palladio. In certain examples these minor domes have drums, and show outside as turrets like in Santa Maria Campagna at Piacenza, and St. Guistina at Padua; but in St. Salvatore at Venice the drum is omitted, the dome springing from a string just above the heads of the small arches, which were united by pendentives.

By the use of the surface vault, as already explained, a still further reduction of height can be effected. The same course can be adopted with the central dome, as in St. Rosa, by which means the whole interior may be brought to a unity and spaciousness of effect such as the first efforts could not attain, owing to their excessive proportions. There are cases, of course, where the five-dome plan might be used for the opposite quality, should a frankly tower-like result be desired, for if sufficient altitude were given to the minor domes, the central feature could be carried to an otherwise unattainable elevation, producing a strong impression of height, but at the expense of what are generally considered to be the special characteristics of the dome.

The Fortezze Church at Viterbo, dedicated to St. Francesco e Paolo, is just outside the walls of the town. It was built for one of the Farnese, who were great patrons of the architect Vignola; he was, in fact, building Caprarola for them between 1555-9 in the same neighbourhood, so that the attribution of this work also to him is not unreasonable. The exterior is unfinished, and the interior rather rough, though not wanting in dignity. This example is interesting in our enquiry, because in the same town is St. Rosa, built in 1848, of almost the same dimensions, but of an entirely different internal effect.

The quality of space tends to disappear when much height is given, and not only are the minor domes of St. Rosa proportionately less in height, but the surface vault principle being applied to the main dome, a great reduction in the total height is obtained on a similar plan of nearly equal dimensions. The greater effect of spaciousness obtained is very much more than is accounted for by the actual difference in size. Some part of this is due to the greater attention bestowed upon the minor domes, and to the attempt that has been made to bring them into closer relation with the central area. The modifications introduced into the plans of the main piers are in this direction, and also in that of providing a better seating for the start of the domes. It will be observed that the minor domes might have been treated as surface vaults, reducing their height, with a probable gain in spaciousness of effect to the whole interior. The aim in a church of this type must be to get good cross views, and a perfect relation between the central and minor domes, in which respect the relative bulk of the four great piers is a matter of primary importance.

The church of St. Maria del Letto at Pistoia (about 1509, by Ventura Vitoni), shows that a tempting solution of this side of the problem was not untried. It seems easy to replace the piers by four single columns, giving a practically unencumbered square interior, while carrying on them the vaults and domes above, as we find done in Byzantine examples, or in La Martorana at Palermo, in which last pointed arches are used. Renaissance examples also are to be found, in which single columns are used, and one in which a group of four half-columns fused together forms the pier. The drawback to this single column plan lies, however, in its excessive simplification, by which it loses interest, a single glance reveals the whole interior, and also seems to stamp the upper part as somewhat of a fraud, so much architectural scenery above with so little apparent support below. Whereas the pier system, at any rate, has more reserve and mystery, while the unity and relation of parts can be equally well preserved, and above all it has that air of stability which constitutes so large an element in genuine architectural effect.

When the Santa Maria del Letto type is extended on all sides, still using columns, the plan of St. Stephen's, Walbrook, is approached, as the formation of a central octagon by the omission of the four middle columns becomes necessary to secure the relative increase of importance to the dome. We have, in fact, a hall of columns to which a cupola is applied in order to secure a free central area. The type is essentially a compromise owing to the tendency in the spectator's mind to restore the omitted columns, an impression probably arising in part from the difference of scale between the small bays of the colonnade and the wide central area.

It is interesting to remember that Palladio's favourite form of vestibule is a hall about thirty feet square, having four columns about five feet out from the angles. In his designs the central area thus formed is usually cross-vaulted, leaving flat ceilings for the angle squares; but with a domical treatment the five-dome plan is obtained, and would be equally palatial in effect. This is recorded, in passing, as an illustration of the domestic application of this type.

El Sagrario, at Granada, a Spanish example built in 1705-59, approximates in scale of plan to St. Francesco and St. Rosa, but exhibits a wide variation of internal section. In this instance height has been striven for, and attained by making the interior practically in two storeys, the minor domes being lifted above the main order. The chief peculiarity, however, is that the minor cupolas are placed at the cardinal points of the main dome, the angles being cross vaulted. The plan obtains considerable extension of a series of deep recesses in the external walls, and by adding to this a relative smallness of features, the impression of a large church is produced. In comparison with St. Rosa, it is interesting to observe that the central squares of both are of the same dimensions, all the increase of size in the Spanish example being given to the surrounding areas. The surface vault, however, of St. Rosa conveys an idea of a dome of much greater diameter than in El Sagrario, where the greater height also detracts from the importance of the central feature. If the system of the Spanish example were carried to its logical development the effect of a square hall would result, the lofty piers becoming incidents in the interior, while the minor domes, acquiring the importance of the central feature, would seem to be parts of one comprehensive domical covering. The arches in three tiers in the side sections, rising from the wall recesses to those which carry the vaulting of the angles, and on up to the arches of the minor domes, constitute the best feature of the scheme. The many breaks in the detail are characteristic of the Spanish use of the orders.

The church of Madonna della Steccata at Parma, built by Giov. Franc. Zaccagni from 1521-39, is like the Invalides at Paris and churches of that type, in that the angles of the plan are not brought in as parts of the general effect. This is especially the case in this instance, as the only openings are small doorways, thus reducing the plan internally to a simple Greek cross, like the church of St. Maria Carceri at Prato, a type which it is not our purpose to discuss. An interesting point about this example is the greater attention bestowed upon the exterior, and the fact that the cupola drum is surrounded by an arcade in place of the more usual colonnade, while the curve of the interior and exterior dome are almost the same.

In the church of Santa Maria Campagna Piacenza (1522-28), attributed to Bramante, the angle domes are carried up as turrets outside, with the usual loss of internal effect. The exterior is an interesting piece of brickwork, rigidly following the lines of the interior design. The five-dome plan is here extended by barrel vaulted bays on all sides, giving length and a transept effect; while the diamond, on which these plans naturally shape themselves, falls within the walls of the church. Except for a gain in cross views and accommodation, the architectural effect is not much improved, though, of course, greater height can be indulged in with success.

There is a diagonal line to be applied in section, as well as in plan, when determining the height of these interiors. The most suitable point to consider is that at which the circle of the dome lantern, or the apex of the cupola, is to be cut off by the cornice of the springing, or by the crown point of the enclosing arches. The same consideration applies also to the minor cupolas. The next important station point is that in the extreme angles of the plan, from which the relative bulk of the great piers can best be appreciated. The plan of these piers is, therefore, a point of great interest, for, obviously, on that depends the extent of the cross view of the interior as a whole, as well as the appearance of adequate support for the superstructure.

The first improvement on the simple early form of a square recessed pier is to cant the angles towards the smaller domes, as is done slightly in San Francesco, and rather more in St. Rosa; the piers of Santa Maria Ghiara at Reggio (built in 1597 by Alesso Balbi) have very large cants to these minor features. When the domes are surface vaults, the cant is like the start of the cupola, and where a pendentive is used it acquires greater importance beginning in that way than when it commences from nothing in the internal angle of the pier. A large cant to the main dome characterises the Spanish example, El Sagiario, which has also the arch bands of the minor domes doubled, as occurs in late instances. A form of pier of a different character is obtained from the column type, as in St. Maria del Letto, when minor arches are introduced under the entablature, so that the order becomes one quarter engaged. There was an example by Sansovino, St. Geminiano, Venice (1556), now unfortunately destroyed, of about the same scale of plan. The column on the angle of the minor squares is an effective feature, though with any close adherence to the Order system certain detail difficulties would have to be faced, which probably accounts for the rarity of this type. The great development of pier in St. Alessandro, Milan, obscuring the angle domes of the plan, exhibits a tendency backwards to the plan of St. Peter's at Rome, as it now is, with its isolated angles and absence of cross views. We have not in this essay to deal with questions of architectural detail, but we may say, in passing, that these piers belong to that late phase of the Renaissance already alluded to, when an attempt was made in using the orders to give them a separate character. This idea was expressed in various ways, but the plan of inserting a complete column, and forming a recess behind it, as in this example, was a favourite expedient.

The complications of the Order system are possibly more felt in the second type than in the first, as the same need for the vertical lines of pilaster and column is not experienced in the five-dome plan as in the domical church.

St. Alessandro, at Milan (by L. Binaghi, built in 1589-1602), may be described as belonging in part to both of the selected types. It exhibits a skilful extension of the five-dome plan eastwards instead of westwards, as is the more common. By this means on entering we realise at once the full effect of the main dome, unweakened by any preliminary extent of nave, while the second impression of length beyond is pleasing and the manner is good, as the second dome repeats the first but in saucer form, wisely attempting no second effect of height, and the vista then closes in with the natural termination of an apse.

Without entering on a third division of the subject, we will glance for a moment at the later stages of the domical architecture of the Renaissance in Italy. We have alluded above to a late form, in which irregular octagons are domed with strong ribs from the angles, as somewhat converting the dome into a vault in effect, though still leaving something of its special character. There is considerable boldness of effect in some of the later examples of this type, as S. M. di Gradi, Viterbo (built in 1740 by Salvio Niccolo). S. M. Vita Bologna (1687-1787, G. Borganzoni) is an instance, but with the plan enclosing an oval shape, such as in the last period became a marked feature.

Such oval churches as S. Pietro e Paolo, at Ceriano (1670-1679), and S. Maria Prato, at Gubbio, are interesting in the present day, because experiments have been tried quite recently in oval interiors, and the geometrical and structural aspects of the problem can be observed in these old examples, bad and unsuitable as their details may appear. A special study might well be given to this type on that account.

Of the hexagon variety, S. Giovanni Evangelista, at Orvieto, is an example; while the curious late attempts to, as it were, square up within an oval circumference a central circle or square, with annexes reaching towards the boundaries of the enclosing curve, are illustrated in the Church of the Madonna di S. Luca, at Bologna (1731, C. Dotti). The Madonna at Macereto, by a pupil of Bramante, is an earlier form, in which the central square and annexes are comprised in an octagon. St. Jean at Burgos is more closely connected with the five-dome plan, though the octagonal boundary has reduced the minor domes to triangular spaces of vaulting. The interior is spacious, and seen at a glance. The piers are tall and slender, almost to excess, while the dome is somewhat small, and tends to lowness of effect, owing to the proportionate increase of the surrounding areas. The use of the pointed arch to solve the difficulties of the triangular vaulting is a singular fact.

In conclusion, I have endeavoured to treat the subject of Domical architecture as a question of structure in an artistic sense, and of proportion both of plan and section, independent of what is called style. While details are decaying, form in structure may still be progressing, and the interest of the later examples is often due to an advance in the general handling of the problem. This progress may be lost sight of if we allow ourselves to be blinded by prejudice induced by the detail employed, more particularly in late examples of the Renaissance.

An instance of the independence of detail of these problems may be seen in the new church of the Sacré Cœur at Montmartre, which, though Romanesque in detail, belongs to our second type. Amongst other points this example shows how an increased height can be obtained in the minor domes of the five-dome plan by the simple expedient of forming openings with Welsh groins in the barrel vaults enclosing the dome, so that the space within the hollow piers is opened up. By this means the effect of an otherwise excessive height in the minor domes is obviated, and their area is included in that of the main structure. If, however, this process is carried too far the square hall effect is produced. Somewhat analogous is the treatment of angles of the supporting vaults of the Pantheon, Paris, though here carried out with an excessive lightness of pier, and in a somewhat disconnected manner, due mainly to the entablature of the order below.

The Roman Catholic Cathedral, in progress at Westminster, is an instance of the use of domes on a large scale, the nave consisting of three domed bays of 60ft. diameter. The side arches are here divided into two bays, as in St. Antonio at Padua, while structural galleries are obtained by arches on columns as in St. Mark's.

Many other developments are possible, and will occur in future examples of domical architecture. An irresistible tendency to development will be displayed in architecture when a start has been made on the lines of a possible system. The first experiments are often reckoned as failures, but the future is more indulgent than the present, and a consideration of their importance as links often gives a credit to buildings that might be denied to them solely on their artistic merits.

THE DISCUSSION.

Mr. Phene Spiers, in proposing a vote of thanks to Mr. Bolton, said he had had difficulty in trying to follow the paper, as he could not readily recall the churches referred to by Mr. Bolton, owing to the long time that had elapsed since he visited Italy. The domical church, as he understood it, was one in which the dome was the principal feature as at Santa Sophia in Constantinople, and not simply a covering over spaces.

Mr. H. H. Statham seconded the vote, and Mr. C. H. Brodie, in supporting it, could not help thinking, with reference to domical construction, what a splendid use of concrete and iron would probably have been made by Sir Christopher Wren, in building St. Paul's, if he had had these materials at his command.

Mr. G. H. Fellowes Prynne, in putting the vote, was very glad that Wren had not had iron and concrete; St. Paul's was one of the most perfect churches in proportion. Speaking of the dome, he could not help wondering why Gothic architects had not taken up the dome, which seemed to him to have the very essence of Gothic construction.

The vote of thanks having been carried,

Mr. Bolton, in reply, said he had expressly set aside such great domes as Santa Sophia. He meant by a domical church one in which the principal of the covering was a dome. To his mind a church with several domes in it was a very interesting study. He agreed with the president in objecting to the use of concrete and iron.

Dumfries and Maxwelltown Public Library Plans Competition.—In this competition thirty-one plans were lodged with the committee of the joint Councils, eight of which were measured. The plan of Mr. A. S. Crombie, Dumfries, was selected. The professional assessor, before measurement, placed the plans in the following order of merit:—First, Mr. Frank Carruthers, architect, Dumfries; second, Mr. Rupert Savage, architect, City Press Chambers, 148, Aldersgate Street, London, E.C.; third, Mr. James Crombie, architect, 25, Ramsay Road, Brixton, London, S.W.; fourth, Mr. Alan B. Crombie, architect, Dumfries; fifth, Mr. James Chalmers, architect, Central Buildings, 93, Hope Street, Glasgow; sixth, Messrs. A. B. Robb and F. G. Grierson, architects, Imperial Buildings, Ludgate Circus, London, E.C.; and the committee added those of Mr. John A. Campbell, architect, 44, West George Street, Glasgow, and of Mr. Thomas Martin, architect, Leeds.

LONDON BUILDING IN 1899.

ALTHOUGH few very important buildings were completed in London last year, a commencement has been made on several schemes of considerable interest. The chief of these are the new Government buildings in Parliament Street and the Victoria and Albert Museum at South Kensington. The buildings of most interest completed last year, were, perhaps, the Tate Gallery and the north block of the new Admiralty. The Tate Gallery has been enlarged greatly, and the new sculpture hall is already in use; the new Admiralty block, although completed, will not be occupied for another six months, when it is to be hoped the old houses in Spring Gardens will be pulled down and the Mall opened into Charing Cross. The new block of the Record Office is now ready, and the strip of ground at the back has been converted into a very effective little garden.

Last year has been a year of theatre building. In central London Wyndham's new theatre has been erected, and opposite it the new Hippodrome, largely masked by a lofty block of shops and offices. The suburban theatres have been increased by one at Ealing, the Duchess Theatre has been built at Balham, a fine Moorish-looking one on Richmond Green, and the Terriss Theatre at Rotherhithe. The Empire Music Hall has been built at Holloway, another Empire at Deptford, while the Bedford has been rebuilt at Camden Town.

This has also been a year for hospitals. The new City Ophthalmic is a fine brick building in the City Road, while the Gordon Hospital is housed in a separate new edifice in the Vauxhall Bridge Road. The City Orthopœdic in Hatton Garden, and the Alexandra Children's Hospital in Queen's Square have been rebuilt; while the Middlesex and London Hospitals have built medical schools and laboratories. Queen Charlotte's Hospital has been considerably enlarged, and a fine brick Nurses' Home erected opposite. Westminster, the Royal Free, St. George's and other hospitals have made extensive alterations and additions. A pretty little Gothic cottage hospital has been built as a Jubilee memorial at Woodford, and the British Institute of Preventive Medicine in the Grosvenor Road.

A building often mistaken for a hospital is the new Marylebone Workhouse, with its handsome brick and stone front. A Passmore Edwards' Free Library has been built in the Borough Road, and a Newnes Library at Putney. Penge also has a new library, and a teachers' orphanage has been established at Sydenham. Public baths and workmen's dwellings have been built at Shoreditch, a fourth Rowton Hotel at Hammersmith, and a new fire station at Lewisham. King's College Schools have been removed from the ugly brick annexe at Somerset House, overhanging the Embankment, to Wimbledon Common, so there is no reason why this disfigurement to Somerset House should not be pulled down.

The last great trunk line (the Great Central) has been brought into London, and the station, with the vast red brick hotel in front of it, is a prominent object in the Marylebone Road. The City and Waterloo, the second electric railway in London, has been opened this year.

Noteworthy additions to the street architecture of London are the Carlton Hotel in Haymarket, W.; the River Plate House, in Finsbury Circus, an ornate stone building, the headquarters of the great South American companies; a fine block of brick and stone buildings on the site of Bedford Chapel, another at the Oxford Street corner of Southampton Row, a third close to the Soho Bazaar, and another block nearly opposite. The stucco front of a well-known Regent Street fruiterer has been changed into a stone one. The Queen's Hotel in Leicester Square is a fine building of white stone, while the café next it is resplendent with gilt carving and gilded domes, quite changing the appearance of that once depressing region. At Knightsbridge the extensive premises of Messrs. Woolland form an exceptionally fine block in white stone, with much ornament.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

MODERN LONDON BUILDINGS.

NORWICH.—C. O. W. writes:—"Would you kindly inform me whether there is any book published which is copiously illustrated with photographs of the most important buildings of architectural interest in London. I find that in most books on the subject the reader is referred to examples in London."

No such book has been published on modern London buildings, but the following may be found useful: "Modern London Buildings: The Institute of Chartered Accountants. (John Belcher, architect)." £1 1s. (Batsford). Perhaps Messrs. Bolas and Co., of 77, Oxford Street, W., could supply you with photographs of the buildings you desire.

IMPROVER'S SALARY.

DROGHEDA.—CELT writes: "What salary should I ask on going out as an improver of about three or four years' experience? I can colour, trace, prepare plans from rough sketches, and prepare specifications, and can also do general office work and correspondence. I think yours a most valuable journal."

This is a very difficult question to answer, as so much depends upon circumstances, such as the cost of living and the age and ability of the improver. Generally speaking, it is best to accept a small salary, just sufficient to live upon on the smallest scale—say 25s. a week in London—and to move from office to office about every six months, varying the experience as much as possible, until a good salary can be justly claimed for a permanency.

G. A. T. M.

BOOKS ON DOMESTIC ARCHITECTURE AND ALPHABETS.

PUPIL writes:—"I should be glad if you would kindly recommend me a good book on the different styles of domestic architecture, and also one on ornamental lettering suitable for architectural drawings."

The following will doubtless suit:—"Analysis of Ancient Domestic Architecture in Great Britain," by F. T. Dollman and J. R. Jobbins (2 vols.), £2 2s.; "History of Renaissance Architecture in England, 1500—1800," by Reginald Blomfield, M.A. (2 vols.), £2 10s.; "Details of Gothic Architecture," by J. K. Colling (2 vols.), £2 2s.; "Alphabets Old and New," by Lewis F. Day, price 3s. 6d. net. The foregoing may be obtained from Mr. B. T. Batsford, 94, High Holborn, W.C.

STIPULATED CAPACITIES OF FLUSHING CISTERNS.

LONDON, N.E.—T. R. T. writes:—"Will you kindly let me know what is the smallest cistern that can be used with a valve closet. Will two gallons, the amount the water companies specify, be insufficient?"

A two-gallon flushing cistern (with after-flush) is the smallest size that should be used with a valve closet, and, if a cistern of good type is selected, will prove satisfactory. From a sanitary standpoint, it is in every way desirable to use a three-gallon flushing cistern when practicable, so that the volume of water may be sufficient not only to thoroughly flush the basin, but also to carry the fæces through the trap and branch drain, whilst at the same time providing the necessary after-flush to properly recharge the closet basin. As, however, the regulations of many water companies require that the quantity of water used for closet flushing purposes shall not exceed two gallons per flush, a two-gallon flushing cistern is the largest that can be used in such cases.

T. E. C.

LAYING OUT STREETS.

HEXHAM.—A. Z. writes:—"I am laying out a building estate, and on one of the boundaries to which the street runs parallel the adjoining owner (who intends laying out his land at an early date) would not agree to lay out the street that adjoins his land so that we may each give up half. I, therefore, sent in my plans showing 18ft., half the required width (36ft.) and the U. D. C. have returned the plans to have the full width shown. I am depending on the case Regina v. Thompson. Model by-laws are in use. Is there any other case against me?

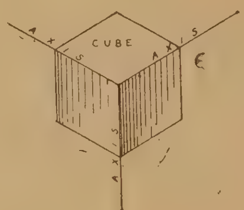
The case of *Gozzelt* v. *The Maldon Urban Sanitary Authority* (Law Reports: I. Q. B. D., 327 [1894]) appears to support our correspondent's view, and we are not acquainted with any decision which directly opposes it. He may argue the question with the local authority, but should not build in defiance of them, unless he is prepared to incur legal expenses.

G. H. B.

AXES OF A CUBE.

BIRKENHEAD. — DUNDIRNODDLIS writes: "What is the 'axis' of a cube? Is it the line joining the centre of two opposite faces, or is it the diagonal of the solid?"

By definition, "the axis of any geometrical solid is the right line which passes through the centre of all the corresponding parallel sections of it." This would make the axis of a cube either the lines joining the centres of the opposite faces or the lines joining the diagonally opposite solid angles, and the isometric axes correspond to the three edges meeting at either solid angle, so that it will depend upon the context what is meant by "axis of a cube." In the absence of context it would presumably be a line joining the centres of two opposite faces. The accompanying sketch shows a cube in isometric projection with the three isometric axes making equal angles of 120deg. with each other.



HENRY ADAMS.

ESTIMATING FOR PLASTERERS' WORK.

LONDON, N.E.—F. B. writes:—"I shall be extremely obliged if you can give me some information concerning the estimating for plasterers' work—the method adopted for pricing, both for solid and fibrous plastering. Can I get a book on the subject?"

The art of estimating for plasterers' work can only be acquired by practice and a knowledge of local wages and cost of materials. Other important items are district, height of buildings, cartage, scaffolding, water, season of year in which certain classes of plasterwork, especially exterior work, are to be executed; class of workmen to be employed, and mode of payment. There is no book yet published, or likely to be, which treats exclusively on estimating for plasterwork. Approximate prices for plasterwork are given in all price books. Considerable help on this subject will be found in works on estimating, a list of which may be obtained from Mr. B. T. Batsford, 94, High Holborn, W.C. Some useful hints will also be found in "Specification."

W. M.

PATCHES ON DISTEMPERED WALLS.

WISBECH. — T. B. W. writes:—"(1) The plastered walls of a new building were clearcoled and distempered in a sea-green tint, but patches of yellow have since appeared over the entire surface, more pronounced in some places than others. Ordinary stone lime was used in the plastering, and this appears to have disintegrated the colouring pigments. Can you explain precisely the chemical action that has taken place, and what other colours must be avoided on new walls? Also, must this distempering be washed off before any further coats are added, or could it be further clearcoled and distempered? (2) When building next the street or the adjoining owner, is it legal or customary to project the footings of the wall beyond the true boundary line, in order that the outside face of the superimposed wall may form the boundary line proper and that the wall may be centrally placed over its footings?"

As the yellow patches have appeared more pronounced in some places than others they are doubtless due to some foreign matter in the distemper. With the exception of oxide of iron, which forms only a small percentage—about 1 per cent—in stone lime, there is no other component part that would affect the distemper. If any foreign matter had found its way into the lime, the slaking, working up, laying and spreading of the stuff would have distributed it evenly, and, assuming that it had the power to cause a yellow colour in the distemper, the colour would have been uniform over the surface and not in patches. In the absence of samples of the plasterwork and the colouring pigments used for the distemper, it is impossible to state precisely the chemical action that may have caused the discolouration. In our opinion the whole of the distemper should be removed and the walls left clean and allowed to dry, and then, unless any defects or yellow discolouration in the plasterwork is noticeable, the distempering may be re-done, taking care that the clearcole and distemper are clean and of good quality, and that both are properly applied. With regard to the question of "footings," consult your local District Surveyor, and thus avoid the complication of building Acts, sections, sub-sections and by-laws, which vary more or less according to district.

W. M.

ROUGH CASTING.

CALCIC writes:—"I have some rough casting to do on brickwork facing west. Please say how a white ground, as matrix, with dark stone, should be prepared, best material, &c."

Obviously there is a mistake in this query. "Matrix" means a mould or a cementing material, and has no connection with a "white ground." Rough cast is executed by first cutting out the mortar joints in the brickwork and then cleaning and wetting the surface to give a sound key for the plaster work. For best work, two coats of lime and hair is used, and one coat for ordinary work. If the walls are damp or in a position exposed to wind or rough weather, a coat of Portland cement and sand, gauged one part of cement to three parts of sand, should be used. The stuff should be laid sufficiently thick to allow the shingles or other surface aggregate to have a key when dashed on. The surface should be laid fair and parallel with all wood stiles and bands, so as to obtain uniform margins. While the stuff is soft the shingle should be evenly thrown or dashed with a scoop. The surface of well-dashed rough cast is so evenly and closely filled with shingle that there is little or no plastered ground to be seen. The exposed surface, or protruding parts, of the shingle gives the colour. Shingles are generally used for the surface aggregate, but fine and varied effects are obtained by the use of various coloured stones, flints, shells, broken pottery, crushed granite, slag, spar, &c. A good white surface is obtained by the use of spar. Bands, margin and ornamental devices may be obtained by using a differently coloured aggregate to that used for the main surface. For ornamental devices the aggregate must be inserted singly by hand. Ornamental parts may also be cast and then fixed in a similar way to mosaic tiling.

W. M.

"The Garden" begins its new volume (the 57th) with more pages and more illustrations; the latter are excellent.

Views and Reviews.

MODERN HOUSE CONSTRUCTION.

This book, or rather collection of several books within one cover, has been rather unfortunately named, as the actual construction of a house receives comparatively scant attention, the greater part of the first volume and practically the whole of the second being devoted to sanitary work of one kind or another — drainage, plumbing, ventilation, lighting, and sewage disposal. Probably no better exposition of domestic sanitary work has yet appeared, and particular credit is due to the editor for the way in which the whole has been arranged and for the small amount of overlapping, of which a little is unavoidable when the several chapters are the work of different authors. There is also very little obtrusion for the purpose of its condemnation of that which is now condemned, so that it is practically impossible for a student to misinterpret or go wrong, everything shown being clearly described and excellently illustrated and entirely in accordance with the best modern practice. In the two-volume form it is bulky, and likely to be treated as a library book of reference only, and we much prefer it in the six-volume form in which it has been issued to subscribers, as being more handy if less imposing in appearance. M.

"The Principles and Practice of Modern House Construction." Edited by G. Lister Sutcliffe. The Gresham Publishing Company, 25, Farringdon Avenue, E.C., and 130, Bath Street, Glasgow.

A BUILDING TRADES "WHO'S WHO?"

The idea of this annual is distinctly a good one. But, having said that, we have mentioned all that is estimable about it. In a book with this title we expect to find all the leading men in the trade noted, but, instead, the majority of the biographical sketches are not of those in the front rank, by any means. The letterpress devoted to each is distended with a lot of uninteresting matter, which is still further reduced in comprehensiveness by the large size portraits introduced. To read the descriptions is to be impressed with the idea that each individual is more famous than his fellows. As a humorous work this book would no doubt achieve some success. We are told in the case of one gentleman that "the success which he has attained is due to his inventive genius and steady perseverance, and the record of his career presents a striking example of what can be achieved by the unaided efforts of a man determined to rise to the highest possible point." We shudder to think of what his efforts might have attained if they had been aided. While this gentleman reaches the "highest possible point," another fell so deep as 73ft., and "although it was believed the fall had killed him, he speedily recovered." This irrelevant matter is, we suppose, introduced to spread out the illustrations, but it would have been much better to have done without them altogether, or at least reduced them to a very small size, so as to enable a more comprehensive biographical list to be given. We learn from the preface that it is the earnest hope of the publishers of this annual "that for many years to come it may serve as a trustworthy guide and a valuable means of strengthening the bonds of mutual confidence and esteem uniting the various members of the building trades of the United Kingdom." We hope so too, but in its present form it is not likely to achieve that result.

"The Building Trades Annual: 1899-1900. Who's Who? A comprehensive series of Biographical Sketches." London: The Westminster Press, Ltd., Carteret Street, Westminster, S.W. Price 1s.

WORKMEN'S COMPENSATION.

This compact little volume should be of great practical utility to the building community. It contains all the cases in which the Court of Appeal has endeavoured to interpret that most obscure of enactments, the Workmen's Compensation Act; it adds a supplement comprising a few of the more important county court cases; it is enriched by notes; it includes a copy of the Act; and it is put together by Mr. Minton Senhouse, a jurist who has made this branch of the law peculiarly his own and whose treatise on accidents to workmen has been quoted with approbation by the Court of Appeal.

There is scarcely a builder in a large way of business who has not had, at some time or other, to consult his solicitor as to the Workmen's Compensation Act—the utter obscurity of which must be the first thing that strikes him in connection with it. It has been described as a budget of conundrums worthy of the interlocutor of a negro minstrel troupe. Its definition clause cannot be comprehended without reference to a basketful of other enactments—and can scarcely be comprehended then. Such ordinary terms as "railway," "factory," "mine," "quarry," are to be understood, not by reference to the Imperial Dictionary, but by reference to the Regulation of Railways Act, 1873; to the Light Railway Act, 1896; to the Factory and Workshop Acts, 1878 to 1891; to the Factory and Workshop Act, 1895; to the Coal Mines Regulation Act, 1887; to the Metalliferous Mines Regulation Act, 1872; and to the Quarries Act, 1894. And even when the Act gives a definition of its own, it sometimes entirely changes the established meaning of words; for instance, it defines a factory as including a "dock, wharf, quay, warehouse, machinery, or plant to which any provisions of the Factory Act is applied by the Factory and Workshop Act, 1895, and every laundry worked by water or other mechanical power." But who on earth would have supposed that a wharf or a laundry was a factory?

The Act applies to buildings. This some of my readers know to their cost. More correctly —for it is necessary to quote the very words of an Act which seems likely to be litigated word by word—it applies "only to employment on, in, or about any building which exceeds 30ft. in height, and is either being constructed or repaired by means of a scaffolding, or being demolished, or on which machinery driven by steam, water, or other mechanical power, is being used for the purpose of the construction, repair, or demolition thereof." The statute has not been in force eighteen months and yet this portion of it has given rise to endless litigation. For instance, does the 30ft. limit apply to a building in course of construction on which machinery driven by mechanical power is used for the purpose of such construction? The Court of Appeal said "No" (*Mellor* v. *Tomkinson*, 15, *T. L. R.*, 142).—Is painting a house repairing it? "No" again (*Wood* v. *Walsh*, *id.*, 279).—Is strengthening a completed building not in need of repair repairing it? "No" again (*Hoddinott* v. *Newton*, *id.*, 299).—What is a scaffolding? Is a ladder leaning against a house a scaffolding? "No" again (*Wood* v. *Walsh*, *ubi sup.*).—Are scaffold boards 8ft. high from the ground, resting on ledges secured to iron columns and supported in the middle by trestles, all within a building, a scaffolding? "Don't know," said the Court of Appeal; "but, as the county court judge has held them to be a scaffolding, we cannot say there is no evidence to support his decision." Then, among the "scaffolding" problems left undecided is the question whether the scaffolding should have any relation to the height of the building? whether there is any difference between "scaffolding" and "*a* scaffolding?" and, indeed, whether the term "scaffolding" can be defined at all. Lord Justice Henn Collins pronounced its definition to be impossible, but stated that it was possible to say as to certain cases that they fell within or without the Act. The best definition yet put forward seems to be that formulated by Judge Stonor, one of the ablest of living judges. He adopts the definition of the Glossary of Architecture, that is, "a temporary erection of poles, planks [cords], &c., for the use of workmen in building walls or executing any work which they cannot otherwise reach," "which" Judge Stonor proceeds to say, "is always secured and fixed, and not a temporary erection of two pairs of trestles with boards across them, unfixed, unsecured, and moveable by the workman as occasion may require." (Stack v. Counsell, 106, "Law Times," p. 342.)

Anything enabling the harassed builder or architect to thread the mazes of this statutory labyrinth is greatly to be praised; and I have no hesitation in recommending this little work. The effect of each report is set out at its head, in language which cannot be misunderstood, and an exhaustive index is not the least valuable of the characteristics of a work intended as a handy book for all interested in the litigation-provoking statute with which it is concerned. A. O. HARNETT.

"Workmen's Compensation Cases," (principally taken from the "Times" Law Reports). Edited by R. M. Minton-Senhouse, of the Inner Temple, Barrister-at-Law, London. W. Clowes and Sons, Limited, 6s.

New Patents.

These patents are open to opposition until February 20th.

1899.—Oil and Paint Cans.—982 C. R. GORRINGE, London, N. The cap of the can has riveted to it on the inside a spring which is bent outwards at each side to engage with stops or projections on the neck of the can. To fix, the cap is given a turn; it is, of course, provided with a washer to ensure a tight joint.

Rainwater Gullies.—2,434. J. DUCKETT and SON, Ltd., and J. DUCKETT; both of Burnley. The gully is made in two parts—a top and a bottom part. The top part is square edged and has two openings, one for the rainwater pipe and the other to receive a grating. On the underside of this upper part there is also a circular lip (about 1in. deep) which fits into a socket in the lower part and enables the trap to be turned in any direction—thus avoiding bends.

Cutting Tiles.—3,460. W. W. MORRIS, Goole. The machine has top and bottom cutting wheels as usual, but both are spring mounted, so that the blows delivered have a percussive and not a crushing effect. It is claimed that the tile can be cut very quickly and cleanly.

Sash Lines.—3,522. C. W. L. FREEMAN and W. C. OLD; both of Birmingham. The sash stiles are grooved to receive the cords, and the knots on the latter fit into circular recesses at the bottom of the grooves. These recesses are covered by metal plates, let in flush, which have inwardly projecting lugs that form a shoulder for the knot to bear against.

Gas Lamp Lighting.—14,948. E. J. SHAW, Walsall. By an arrangement of the gas passages in the plug of the cock, it is possible to have all the burners alight in, say, a three-light lamp, to have the centre burner alight only, or the two outer ones, or to feed only the by-passes. Another part of the invention deals with the prevention of dust entering the lamp globe. This is achieved by providing a glass ball, which will roll and cover the hole in the bottom of the globe after the gas has been lighted.

Joiners' Clamps.—21,401. G. SCHMIDT, Germany. One form of this invention consists of two arms (somewhat like those of a callipers), having movable cheeks at one end and being pivoted to a cross head at the other. Through this latter passes a screw fitted with a crank and handle, and having at the other end a movable cheek. The motion of the arms towards each other is regulated by a screw passing through studs on their face. With this appliance pieces of wood, &c., at different angles can be pressed and held together after being glued or otherwise treated.

Ceilings and Walls.—22,884. F. KEMNITZ, Berlin. Between the girders or walls steel or iron ropes are interlaced, twisted and stretched tight by clamps; their ends may be fastened in various ways, by clamps, hooks, &c. Cement is then laid on. It is claimed that the construction is cheap and strong.

The following specifications were published on Saturday last, and are open to opposition until February 27th. A summary of the more impor-

tant of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—20,025, Durrant, gulleys, traps, &c. 27,567, Pearson, granite, stone and marble sawing machinery.

1899.—631, Duncan, incandescence burners and mantle supports. 682, Seiffert and Tomlinson, apparatus for the production and supply of acetylene gas. 1059, Pruce, means for opening, closing and fixing fanlights, windows, shutters, ventilators, doors, &c. 1066, Miller, smoke consuming fire bridges for boilers. 1254, Mills, Windguards for chimney tops. 1558, Kennedy, brick presses. 2759, Watson and Stevenson, apparatus for gaining access to the exterior and windows of and escape from buildings. 3240, Malkin, Binns and Foster, guards for circular saws. 3753, Saladin, door fasteners and burglar alarms. 3770, Haddan (*Schuppmann*), boilers for warm water or low pressure steam heating purposes. 3859, Moore, manufacture of a substitute for china stone for use in the production of china ware, porcelain, earthenware, stoneware, tiles, bricks, &c. 4115, Caldicott, acetylene gas generators. 4365, Wigham, burning acetylene gas. 5944, Rothkegel, door hinge, 7428, Summers, mortise chisel. 8364, Johnson, axle and sash pulleys. 15,098, Johnson and Hinchliffe, seats of water closets. 16,123, Head and Nielson, method of and means for automatically locking sliding windows at different heights. 20,592, James McClelen Kline and Samuel A. Wetzel, hydraulic rams. 21,340, Thompson (*Bremer Linoleum-werke-Delmenhorst*), manufacture of material for floor-coverings. 21,341, Thompson (*Brady*), fluid pressure turbines. 22,628, Schmitz, process for manufacturing metal pipes. 22,638, Sheak, filters. 22,719, Brown, street sweepers. 22,788, Richter, acetylene gas lamps. 23,032, Johnson (*Compagnie Française de l'acetylène dissous*), acetylene gas burners for use in incandescent lighting.

Mr. George Firth, of New Street, Barnsley, died last week at the age of seventy-eight. He was the oldest master joiner in the town.

Fatal Building Accident at Stoke.—A dreadful accident happened last week at the Stoke Corporation Gas Works. A new retort was in course of construction. A violent gust of wind shook an iron principal, which with six others had been temporarily placed in position to hold the roof. One principal fell against another, and all the seven collapsed, the last of them sweeping down a scaffold upon which some bricklayers were engaged at a height of 70ft. One of these, Peter Plumb, was crushed to death, and five received frightful injuries.

Mr. George Furness, a great engineer and contractor, died last week; he was seventy-nine years of age. Among his achievements were the Thames Embankment from Westminster Bridge to Somerset House, the North London sewerage system, the South-Eastern Railway extension to Port Victoria, and other railways throughout England. He was associated with the late Thomas Brassey (father of Lord Brassey) in railway construction in France, he built the Pernambuco (Brazil) Railway, and carried out extensive draining and dredging works in Russia and Italy.

Temples and Temple Building.—This was the title of Mr. M. Glover's paper before the last meeting of the Architectural Association of Ireland, when the president, Mr. George Sheridan, occupied the chair. Mr. Glover, in the course of his remarks, dealt at the outset with the religious beliefs of the ancient Egyptians, including star worship and sun worship, which were bound up with their system of architecture. With the Egyptians the land of the departed lay somewhere in the North-West. Having explained the Egyptian worship of the sun-god Osiris, and his consort, Isis, and the star worship which preceded it, the lecturer went on to speak of the architecture of the early tombs, which seemed to be the precursors of the Pyramids.

Keystones.

Carlisle Pier, Kingstown, has been improved by being widened and lengthened.

A new Police Station and Court House at Grimsby is to be built. The present building is expected to realise £1,200.

A large Co-operative Store at Newcastle is proposed to be built on the Quayside. It will be seven or eight storeys high and will have a steel frame filled in with cement.

The Deeside Sanitorium is to be begun at once A site, twenty-five acres in extent, has been purchased on Corsee Hill, Banchory. The cost of the building is estimated at £12,000.

Mr. A. Rippin, having severed his connection with The Land Company, has commenced business in conjunction with Mr. Rake at 33, Cheapside, E.C., under the style of The New Century Land Company.

"Hall-i-th'-Wood," Bolton, a fine specimen of fifteenth century architecture, has been purchased by Mr. W. Lever, of Sunlight Soap fame, and presented to the Bolton Corporation. It is understood that it is to be carefully restored.

Dedication Brasses in Norwich Cathedral to the donors to the reparation and organ funds have just been placed on the nave walls. They were designed by Mr. W. R. Weyer, of Bank Street, Norwich, and engraved by Mr. H. B. East.

Tender for new Technical College at Wigan.—For this building the tender of Messrs. Joshua Henshaw and Sons, of Liverpool, amounting to £32,850, has been accepted. A contract for £5,000 for terra-cotta has also been entered into.

Bridge Collapse.—On Wednesday last at High Wycombe, whilst a large traction engine was crossing a bridge spanning the Wye, the structure gave way, and the rear end of the engine fell into the stream. Its removal is expected to be difficult.

The death is announced of Sir Henry Meux.—When Temple Bar was demolished after the building of the Law Courts, he bought the stonework, and had it carefully re-erected on his estate at Theobald's Park, Cheshunt, Hertfordshire, where it now stands.

Scarborough Parish Church has been improved, at a cost of about £1,200. The chancel has been raised and widened, oak desks and seats have been provided, the organ has been removed to the north side, and an iron palisade, a pulpit, and new screens have been erected.

Costly Board Schools for Liverpool.—The Liverpool School Board have decided to accept the tender of Messrs. Holme and Green (£21,633) and that of Mr. William Hall (£32,298) for the erection of schools on the sites in Boaler Street and Birchfield Road, in accordance with adopted plans.

Sutton Board Schools Competition.—From a number of designs submitted in a limited competition for new schools, &c., for the School Board at Sutton-on-Sea, Lincolnshire, those sent in by Messrs. W. Mortimer and Son, of Lincoln, have been selected, and the work will be commenced at once. The scheme comprises schools for 400 boys, girls and infants, together with masters' house.

Theatre for Motherwell.—Plans have been passed for a theatre to be erected in Windmillhill Street, Motherwell. The architect is Mr. Alexander Cullen, F.R.I.B.A., Glasgow, and the cost of the building, which will seat 1,500 persons and will be lighted by electricity, is estimated at about £5,000. The "New Century Theatre" is the name selected.

British Art of To-day.—The chief theme of the first of Professor Herkomer's lectures on painting at the Royal Academy was a condemnation of the fashion in vogue among the younger painters, and a strong advocacy of a revival of the best traditions of the older British school in the place of those modern traditions which our artists have borrowed from abroad.

A School of Art for Hull is proposed to be built. The cost is estimated at about £16,000.

New Branch Library in Leeds.—A new branch public library is to be erected at Stocks Hill, Armley, Leeds. Its estimated cost is £5,000.

The New City Subway, by the Mansion House, which we described in our supplement to the issue for November 29th last, was opened last week.

The Estate of the late Mr. Thomas Huggett, the builder of Cromwell Road, Kensington, W., has been valued at about £81,084.

Mr. Christopher Palliser, J.P., of Northallerton, died on January 14th in his eightieth year. He had a large contracting and building business.

Reid's Brewery, Clerkenwell Road, E.C., is to be swept away. In all, it has realised £26,000. Breweries have, it is believed, existed on the site for nearly 300 years.

Jarrow Municipal Buildings.—It has been decided to appoint an architect to prepare plans and specifications for new municipal buildings at Jarrow, including a county court.

The Hereford and District Master Builders' Association held its annual banquet on Tuesday in last week, when the president (Mr. James Davies) occupied the chair.

For Workmen's Dwellings at Salford, shops, and, a public hall on the site of the Old Infantry Barracks in Regent Road, it is proposed to spend £111,400. A Local Government Board inquiry has been held.

The Liverpool Engineering Society held its annual dinner on Thursday evening last, when Mr. A. Bromley Holmes (the president) occupied the chair. In 1876 the society had fifty-one members; now it has 500.

Forthcoming Exhibition in Leeds.—On Monday next the Twentieth Century Engineering and General Trades Exhibition will be opened in the Exhibition Buildings, Camp Road, Leeds. It will remain open until March 3rd.

Discovery of Mural Decorations.—At the ancient parish church of St. Mary Magdalene, East Ham, some mural decorations have been discovered. They are believed to be eleventh century work, almost synchronous with the building of the church.

Royal College of Art: New Principal.—Mr. Augustus Spencer, headmaster of the municipal school at Leicester, has been appointed to succeed Mr. Walter Crane as Principal of the Royal College of Art, South Kensington, at a salary of £1,000 a year.

Newport (Mon.) Master Builders' Association.—Councillor John Linton and Councillor W. M. Blackburn have been elected president and vice-president of the Newport Master Builders' Association. Mr. W. Jones and Mr. R. Richards are the treasurer and the secretary.

Public Works at Willesden, London, N.W.—The rapidly-growing district of Willesden is about to undertake large public works at a cost of about £128,000. The Guardians will spend £99,000 on the erection of a workhouse, and the District Council £29,000 on the extension of the isolation hospital.

The Church Crafts League is being formed, by those who dissociated themselves from the Clergy and Artists' Association, to bring together clergy and others interested in church decoration and artists and craftsmen who produce this kind of work. The honorary secretary's address is, Leighton House, Holland Park Gardens, Kensington, W.

St. Bartholomew's Close.—At last Thursday's meeting of the Corporation of the City of London it was referred to the Improvement and Finance Committee to consider the best means of opening up and improving the means of communication with the parish of St. Bartholomew the Great and the immediate neighbourhood. Mr. H. C. Morris said it had been found that this improvement would cos £120,000 at least, and the Court last yea decided that it would not be worth the money

Professional Practice.

Birmingham.—The new Board school in Conway Road, Sparkbrook, is now nearing completion. Messrs. Martin and Martin, of Colmore Row, Birmingham, are the architects, and Messrs. W. Whitehead and Sons are the contractors. The façade is plain. Accommodation will be provided for 680 boys and girls and 360 infants. The ventilation is on the most modern and approved principles, the air being washed in the basement before being propelled by the ventilators into the rooms above. In the winter the air will pass over a series of hot pipes, thus being warmed before it is breathed. Fresh supplies of pure air are forced into the rooms every ten minutes. The estimated cost of the school is £14,981.

Cardiff.—New Board schools have been built from designs by Messrs. Habershon, Fawckner and Groves, architects, of Cardiff and Newport, with a frontage to Marlborough Road. There are three separate blocks of buildings, and the schools are the first in Cardiff on the central hall system. The girls' and boys' departments are in the main block; the former contains fourteen classrooms with accommodation for sixty children in each. The boys' department is of similar dimensions. Separate rooms are provided for the headmaster, mistress and teachers, and each department has two entrances with hat and cloakrooms attached. The assembly halls are 90ft. long by 26ft. wide. The infants' department contains eight classrooms with accommodation for sixty children in each—a total of 480—and also separate rooms for teachers. The assembly hall is 49ft. in length by 35ft. in width. As two of the classrooms abutting on the assembly hall are provided with folding doors, this hall can be increased to 60ft. by 49ft. The Slojd department is arranged in a two-storey building, the lower floor being fitted up with benches, &c., for the purpose of instruction in manual trades for some sixty or seventy boys, with separate lockers for tools. The upper floor is fitted up as a laundry and cookery kitchen, accommodating forty and sixty girls respectively, and provided with the latest apparatus. Altogether, the various departments will afford accommodation for over 1,500 children. Lighting is by incandescent gas. Brick has been used in the construction of the buildings, with St. Julian's red brick facing and Bath freestone dressings. The style of architecture is English Renaissance. At the recent exhibition of educational subjects in Cardiff the drawings of these schools were marked off as accepted for the Paris Exhibition. The contractor was Mr. David Davies, of Trade Street, Cardiff, the amount of his contract being £19,666.

Dundee.—A new altar and reredos have been erected in St. Joseph's Church, Dundee. The altar stands on a graded platform of oak parquetry, and is constructed of pure white Caen stone, supported on pillars of Welsh encrinite marble, with richly carved Caen stone bases and capitals. Above the centre of the super-altar is placed the tabernacle, the door being of burnished brass, decorated with *repoussé* work and enriched with groups of large amethysts and carbuncles arranged to form a symmetrical design; and above this door is an alto-relievo panel. On each side a beautifully carved figure of an adoring angel is placed, the figures being sculptured in Caen stone. An oaken staircase leads behind the entablature to the rostrum. The prevailing sculptured decoration on the altar is formed of a series of circumscribed quatre-foils of Gothic character. The apse is lighted by two windows having two lights each, filled in with the figures of the four Evangelists in rich stained glass. The reredos, with its side curtains, fills nearly all the intervening space. It has been designed by Mr. P. P. Pugin, of London, son of the celebrated architect, the late Mr. A. Welby Pugin, and the intention of the designer has been to soften the rigidity of severely Gothic forms by introducing some of the less severe lines of Byzantine architecture. Thus the canopy which projects over the altar is constructed with the usual angular ridge-roof, but the cusping in front and the finials are Byzantine in style. The reredos is divided by pilasters into three large panels filled with figures of adoring angels, about half-life-size, painted in oil-colours upon copper. The inner side of the canopy is divided into eight panels, four on each side, and these are filled with single angel figures. All these painted panels are the work of Messrs. Hardman, of Birmingham. Messrs. Boulton and Sons, of Cheltenham, executed all the carving. The scheme of decoration adopted for the reredos and canopy is the gilding of flat surfaces and the colouring of incisions and hollows with bright crimson, so that the general effect is very rich. This portion of the work was executed by Mr. J. J. Pippet, of Solihull, near Birmingham. From each side of the reredos extend flat brass rods with the word "Sanctus" cut through the metal, and from these depend two curtains which give graceful outlines to the whole structure. The total cost of the work was about £1,000.

Exeter.—St. David's New Church, which has been in course of erection for the past two years, on the site of a previous classical building, was consecrated last week. It has been built by Mr. W. Dart, of Crediton, from designs from Mr. W. D. Caröe, M.A., F.S.A., F.R.I.B.A., of London, after a public competition in which the architect suggested a church built entirely of Bath stone, but in deference to the committee's wish this was changed to Devonshire limestone for the outer walls. The narrowness of the site made it advisable to project the main buttresses into the building, and this adds greatly to the cathedral-like interior of the nave. From these buttresses stone arches spring across the whole width of the nave, and are used to carry the roof timbers from arch to arch. The roof is boarded on the inside of the barrel, and stained green; deeply moulded cornices run along the wall plates, the centre spaces of which are filled by carved angels in adoration. Moulded ribs divide the roof into panels, large spaces being left for future decoration. The chancel roof is of the same construction, but with increased carving effect, and a more ornate cornice. The walls are a mass of rich stonework, covered with decorative designs, the sedilia being particularly graceful, with delicately-carved canopies of stone. The oak reredos has in the centre a large panel with the crucified Saviour, carved in oak. This reredos, as well as the stalls, was built in the workshops at Crediton. The chancel stalls are of wainscot oak. The altar space is raised upon steps of Devonshire marble, the altar steps being of the same material, whilst the floors are in mosaic of varied English and foreign veined marble. The organ chamber is built on the south side. Beneath it, and adjacent, are the clergy and choir vestries, access to which is obtained from the south porch. There is a similar porch on the north side, whilst at the west end a feature of the entrance is a stone arched roof and massive oaken doors on ponderous wrought-iron hinges, the frieze rail of the doors carrying boldly-carved inscriptions. These doors are rather uncommon, the hinges being framed up with them. The total cost has been about £16,000.

Perth.—On Sunday week last St. Paul's Parish Church was reopened after having undergone considerable interior alterations. The old church for some time back has been inconveniently seated and greatly in need of repairing, general cleaning and repainting. The whole area of the ground floor and of the gallery has been reseated with conveniently designed and arranged benches, new wind porches with swing doors have been fitted up at the entrances, the staircases to the galleries have been improved, and the walls covered with pitch-pine lining. The pulpit platform has been rearranged, and a new Communion table and minister's chair in carved oak have been placed on the enlarged platform. Elders' benches have been fitted up at each side of the platform, and sundry improvements to the pulpit and book board have been effected. The windows of the church have been renovated, the old wooden sashes being replaced by leaded lights filled with tinted cathedral glass. The walls and ceilings of the church have been redecorated, and the woodwork stained and varnished. The organ has been recleaned. The improvements have been carried out under the personal supervision of Mr. G. Heiton, architect, George Street, Perth. The contractors were:—Joiner, Mr. M'Quibban; painters and glaziers, Messrs. Stalker and Boyd; heating apparatus, Mr. McGregor. The Communion table and chair were supplied, together with the upholstery work, by Messrs. Love and Son. The total cost of the improvements is £1,000.

Swansea.—The Swansea School Board are adding one more to the number of schools in the borough, this time on a site that comprises one acre and has frontages to Upper Major Street and Edward Street. Very special precautionary measures have been taken with the foundation of the building to prevent any subsidence or cracks occurring, owing to the site being undermined by old coal workings; cement concrete of unusual thickness and width, with steel rails and rods embedded in it, being employed at an expenditure of nearly £1,000 beyond the cost of ordinary foundations. The school will be a three-storey building accommodating 1,230 children in three departments, namely, on the ground floor, 430 infants; first floor, 400 girls; and top floor, 400 boys. Each department will have a central hall 78ft. long by 31ft. wide, with six classrooms and a schoolroom grouped round three sides of the hall. A cookery centre, 30ft. by 24ft., will be provided at the east end of the main building. Ample playgrounds, play sheds, and offices will be provided. The cost will be £18,291. Mr. G. E. T. Lawrence, A.R.I.B.A., of Chandos Chambers, 22, Buckingham Street, Adelphi, London, W.C., is the architect, and the contractors are Messrs. J. and F. Weaver, Mr. David Evans acting as clerk of works.

New Companies.

Robert Millar and Sons, Limited.

This company has been registered in Scotland with a capital of £100,000 in £10 shares, to acquire and carry on the existing business of timber merchants. Registered office: Balmain Street, Montrose.

Yates Brothers (Darwen), Limited.

This company was registered on January 2nd by F. Hatton, 150, Strand, W.C., with a capital of £2,000 in £1 shares, to acquire the business of painters, plasterers, decorators and artists' supply merchants carried on at 234, Duckworth Street, Darwen, Lancashire, as Yates Brothers. Registered office: 1, Varley Street, Darwen, Lancashire.

Avon Aberthaw Lime and Portland Cement Company, Limited.

This company was registered on January 5th by A. H. Atkins, Limited, 23, Bouverie Street, E.C., with a capital of £1,000 in £1 shares, to carry on the business of Portland and other cement manufacturers, lime and plaster manufacturers and merchants, &c. The number of directors is to be not less than two nor more than five. The first are Thomas Hambly and Thomas Williams. Qualification, £100.

Watertight Door Company, Limited.

This company was registered on January 5th by A. H. Atkins, Limited, 23, Bouverie Street, E.C., with a capital of £2,500 in £1 shares, to carry on the business of designers and manufacturers of and dealers in watertight and fireproof doors, &c., and the business of electrical, marine, and mechanical engineers. The first directors (to number not less than two nor more than four) are T. E. Topping (chairman), John H. Hind, and William Hind. Qualification, £1.

S. W. Francis and Co., Limited.

This company was registered on December 30th by Ashurst and Co., 17, Throgmorton Avenue, E.C., with a capital of £60,000 in £1 shares, to acquire, as a going concern, the business of manufacturers of and dealers in revolving wood, iron, steel, and other shutters, now carried on at 64, 66, 68, and 70, Gray's Inn Road, under the style or firm of Francis and Co., and to carry on the businesses of manufacturers of and dealers in every description of venetian aud other blinds, spring rollers, &c. S. W. Francis is the governing director, his remuneration being £1,000.

Hudson, Pearson, and Fernie, Limited.

This company was registered on December 29th by Jennings, Son and Allen, 69, Leadenhall Street, E.C., with a capital of £50,000 in £10 shares, of which 4,990 are ordinary shares and ten founders', to adopt and carry into effect an agreement for the acquisition as a going concern of the business of coal merchants, as now and hitherto carried on by J. Hudson and Co., and a similar business carried on by J. H. Pearson and H. Fernie, under the style or firm of Fernie and Co., and generally to carry on the business of coal and coke merchants; and, further, to acquire any mines, mining, water, and other rights; to search for, get, raise, make marketable, sell, and generally deal in and with brick earth, bricks, and other substances; as stock and share dealers, company promoters, &c. The first directors (of whom there shall be not less than three nor more than ten) are C. Hudson, J. H. Pearson and H. Fernie. Qualification, one founders' or 100 ordinary shares. Registered office: 49, Leadenhall Street, E.C.

Wakefield Building Scheme.—A limited company, composed of Bradford gentlemen, with Mr. Ellis Robinson, builder, as chairman, and with a registered capital of £10,000, has been formed to carry out a large building scheme at Wakefield. The St. John's estate, which has an area of 65,000 square yards, has been purchased, and will be laid out for the erection of residences.

"**The Art and Craft of Garden Making**" is the title of a book which Mr. B. T. Batsford will shortly publish, in conjunction with Messrs. Newnes. Mr. T. H. Mawson is the author. The book will be illustrated by a large number of perspective sketches by Mr. C. E. Mallows, and by more than a hundred plans and details, specially drawn or photographed. The size will be quarto and the price 21s. net.

COMING EVENTS.

Wednesday, January 17.

SURVEYORS' INSTITUTION.—Students' Preliminary Examination—First Day.

BIRMINGHAM AND DISTRICT CLERK OF WORKS AND BUILDERS' FOREMAN'S ASSOCIATION.—Mr. H. Price, A.R.I.B.A., on "House Drainage." 8 p.m.

SOCIETY OF ARTS.—Ordinary Meeting at 8 p.m.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.—Annual Meeting of the members at 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. Algernon Barker, B.A., on "Legal Topics of Interest to Architects and Surveyors." 7.30 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

Thursday, January 18.

SURVEYORS' INSTITUTION.—Students' Preliminary Examination—Final Day.

SOCIETY OF ARTS.—Meeting of Indian Section.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: The Upper Limb." 6.15 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8.30 p.m.

Friday, January 19.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Lewis F. Day, on "Ornamental Design.—III." 11.30 p.m.

ARCHITECTURAL ASSOCIATION.—(Discussion Section.)—Mr. C. B. Bone on "Granite as a Building Material in the Channel Islands." 7 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' Visit to the Hydraulic Installation at Somers Town Goods Depôt, and to the Kentish Town Locomotive Sheds, of the Midland Railway, where a new American Goods-Engine will be inspected. 2 p.m.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. John Castell-Evans, F.I.C., on "Mechanical Physics; Laws of Motion, &c." 8 p.m.

Monday, January 22.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Announcement of Council's Award of Prizes and Studentships, 1900. Mr. Basil Champneys on "The John Rylands Memorial Library, Manchester." 8 p.m.

SOCIETY OF ARTS.—(Cantor Lectures).—Mr. Bennett H. Brough on "Metalliferous Deposits."

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. M. Honan on "Doors and Doorways."

VICTORIA AND ALBERT MUSEUM (South Kensington).—Mr. Hugh Stannus, F.R.I.B.A., on "Historic Evolution of Applied Art: XI.—Byzantine, &c., Christian Art." 6 p.m.

GLASGOW INSTITUTE OF ARCHITECTS.—Council meeting at 2 p.m.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Biennial Dinner. 6.30 p.m.

SURVEYORS' INSTITUTION.—Junior Meeting at 7 p.m.

Tuesday, January 23.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Sir C. Cameron on "Sanitation in regard to Tenement Houses."

GLASGOW ARCHITECTURAL ASSOCIATION.—Lecture by Mr. David Jackson.

SOCIETY OF ARTS.—Meeting of Foreign and Colonial Section.

Wednesday, January 24.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. John Castell-Evans, F.I.C., on "Natural Forces: Light, Heat, and Electricity." 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Evening.

SOCIETY OF ARTS.—Ordinary Meeting at 8 p.m.

Thursday, January 25.

GLASGOW INSTITUTE OF ARCHITECTS.—General meeting at 2 p.m.

SOCIETY OF ARCHITECTS.—Ordinary meeting at 8 p.m.

INSTITUTION OF ELECTRICAL ENGINEERS.—Meeting at 8 p.m.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: The Lower Limb." 6.15 p.m.

Friday, January 26.

ARCHITECTURAL ASSOCIATION.—Mr. W. R. Lethaby on "Cast Iron." 7.30 p.m.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. David Skinner on "Notes on Builders' Lifting Appliances."

INSTITUTION OF MECHANICAL ENGINEERS.—Annual Elections. Mr. William Schönheyder, M.I.M.E., on "Water Meters of the Present Day; with special reference to small flows and waste in dribbles." 8 p.m.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Lewis F. Day on "Ornamental Design."—IV. 11.30 a.m.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

BLAENTYLERY.—For erecting new mixed school at Blaentylery, Abertillery, Mon., for the Aberystruth School Board. Mr. R. L. Roberts, architect, Victoria Chambers, Abercarn, Mon. Quantities by architect:—

Jno. Linton ...	£2,900 0 9	W. Phillips... ...	£2,580 0 0
Thomas and Co.	2,800 0 0	Gaen Bros.... ...	2,545 18 7
Davies Bros. ...	2,718 1 6	Bagley and Co., Abertillery* ...	2,467 1 3
A. P. Williams ...	2,700 0 0		

* Accepted.

LONDON.—For the erection of laundry buildings, boiler-house, chimney-shaft, &c., at St. Anne's Home, Streatham Hill, for the Guardians of the Poor of St. Pancras. Messrs. Salter, Issott, and Salter, architects, 13, Phœnix-street, St. Pancras. Quantities by Mr. A. R. Henderson, 47, Pall Mall:—

W. H. Lorden	£4,895	W. S. Beaton...	£4,023
Smith and Sons	4,682	Gough and Co.	3,784
B. Nightingale	4,273	W. H. Critcher	3,683
A. Bush	4,095	T. G. Sharpington ...	3,673

GOSPORT.—For additions and alterations to the "Victory" public-house, Forton-road, Gosport. Mr. Harry A. F. Smith, M.S.A., architect, Star-chambers, High-street, Gosport:—

Hy. Jones	£875	C. M. Dash...	£819
C. J. Lear and Son ...	829	R. M. Middelton and Co.*	792
Jno. Croad	825		

* Accepted.

SULLY (Glam.).—For the erection of a residence at Sully, near Cardiff, for Mr. Richard Wain. Messrs. Veall and Sant, architects:—

		Extra for Oak Joinery, &c.
Shepton and Son... ...	£2,458 7 0	£446 6 0
Chubb and Co.	2,424 0 0	366 2 9
Melhuish Bros.	2,290 0 0	400 0 0
Jas. Allan	2,256 6 6	385 17 8
W. T. Morgan	2,210 0 0	330 0 0
Symonds and Co. ...	2,204 13 1	336 5 5
Knox and Wells*... ...	2,047 0 0	300 0 0

*Accepted. [All of Cardiff.]

WALTON-ON-THAMES.—For the erection of residence, Beechwood Estate, Oatlands Park, for Mr. Thomas Proudfoot. Mr. J. M. Wales, architect:—

Ingram and Co.	£2,378	W. Greenfield, Weybridge*	£1,650

*Accepted.

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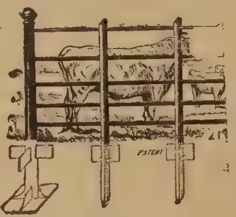

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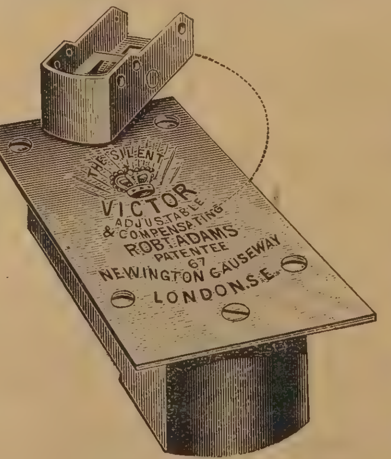

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VENTILATING CROWDED BUILDINGS.*

By Thomas Glover Lyon, M.A., M.D.

At a moment when the necessity of an ample supply of fresh air in the prevention and cure of disease holds a foremost place in the minds of everyone, no apology is needed for bringing the question of ventilating before an assembly devoted to the advancement of hygienic science and practice. An attempt to embrace the whole question of ventilation is not my intention; I shall limit my remarks to one department of this important subject, which is daily attracting more and more attention, and whose application is still in its infancy. The problem is that of supplying air to rooms where there is such an aggregation of people as to render some method of forced ventilation necessary. Examples of such places are concert rooms, public theatres, churches, dining rooms, saloons of ships, and railway cars.

A glance at the problem involved in the ventilation of a theatre containing, say 1000 people, is not out of place here. It is usually considered that each person at a theatre should be supplied with at least 1000ft. an hour. At the Opera House at Vienna, the figure is 1600. Taking this latter as a standard, for 1000 people a supply of 1,600,000 cubic feet is required an hour, or about 450 cubic feet a second. As 12½ cubic feet of air weighs 1lb., this corresponds to about 50 tons an hour, or 30lb. a second. If the total area of entrance apertures be 20sq. ft., this gives a velocity of about fifteen miles an hour, or 20ft. a second. A consideration of these figures is sufficient to show that a very considerable force is required to move so large a body of air and distribute it.

In a case with which I am acquainted, where 600,000 cubic feet of filtered air an hour is forced through a room, a 4-horse power is used. On the same basis, a theatre seating 1000 people would require about 10-horse power. This estimate is, of course, extremely rough.

Once having admitted the necessity of employing force in ventilation, the use of fans becomes obligatory, such contrivances as heated exhaust flues are less efficient and extremely expensive to work. There is another point which should be considered in this connection—that is the pattern of fan to be employed. It is well known that some fans which work well when the passage of air is free are almost powerless when a resistance is offered—in other words, when they have to act against such pressure of air as always occurs when a powerful system of mechanical ventilation is carried out. There can be no doubt that timidity in insisting upon a proper outlay, and a want of judgment in choosing adequate blowing power has largely depreciated mechanical ventilation in the estimation of the public.

While agreeing with most authorities on the superiority of the plenum over the vacuum system, I would insist on the great value of using both systems together, that is of blowing in air at inlets and exhausting it from outlets. Not only by this means is the air in rooms kept at nearly atmospheric pressure, but the necessity of making the building or rooms air-tight is dispensed with.

It would be well also to point out the fallacy of the idea that warmed air entering a crowded room is better than the air already in it. A moment's thought will show this is impossible. As long as air remains in a room it is heated by the breath and body heat of the occupants, and its temperature must rise above the temperature at which it was introduced. In other words, the occupants of a room constitute a heating apparatus. The next question relating to the introduction of air into a room and its withdrawal is at what points the inlets and outlets should be placed. There is great diversity of opinion regarding this very difficult subject.

In considering this question the following points must be taken into account:—(1) *Inlet Impetus.*—Air entering a room in any direction has a tendency to pass on in the same direction by its own momentum. (2) *Outlet Impetus.*—Air flowing in a room tends to take the channels of least resistance, which are invariably towards the outlets. (3) *Internal Descent.*—Air introduced into a crowded room is heavier than that already there, and tends to fall. (4) *Internal Diffusion.*—Vitiated air tends to diffuse itself evenly throughout a building. This force, however, diminishes if the general air of the room becomes foul, and acts very feebly in a badly ventilated room. Its importance also is less the quicker the flow of air. (5) *Internal Ascent.*—Vitiated air has a tendency to rise. This factor lessens in importance with the thoroughness of the ventilation, for it is counteracted by the increased activity of diffusion, and like the latter, when a very rapid passage of air is necessary, this force will have only a very moderate action.

The problem of ventilating a crowded room is much simplified if we remember that to solve it we must carry pure air *en masse* into near proximity to all persons in the room; diffusion can only be relied upon to distribute the pure air through a small space. This convection of air must be effected by means of "Inlet impulse" and "Outlet impulse." "Internal fall" and "Internal rise" will play only subsidiary parts. No specific rules can be formulated to guide us in the employment of these forces; every case must be met after a study of the special circumstances attending it.

There are three main principles of ventilation, each having its advocates:—(1) Some regard ventilation as a mere dilution of foul air. Most of the more modern systems of ventilation adopt this principle. Pure air is thrown into the room upwards from about the middle of the wall, and this, by its momentum, runs on and strikes the ceiling and opposite wall, and gets pretty well distributed over the room. The air finds an outlet at an opening near the floor in the wall containing the inlet. If now there is a fast current of air through the room the air at the top and bottom is of nearly equal purity, and the system works well; but if the current is slow the air near the floor is the best in the room, and there is a considerable waste in removing it.

(2) According to a second principle, air should be let in at the ceiling and withdrawn at such a velocity from the floor that the exhaled air is drawn out before it has time to vitiate that in the room. This has been adopted in the French Chambers of Deputies, but it has been found that a sufficiently quick withdrawal of air to counterbalance the natural tendency of exhaled air to rise causes intolerable draughts, and the system is never employed in its full efficiency; it is indeed a lamentable failure, and is no doubt a potent factor in producing the frequent "scenes" for which this Chamber has an unenviable reputation.

(3) The third principle is a compromise between the first two. It is maintained that fresh air should be conveyed as directly as possible to each occupant of the room, and that the outlets should be at the places where the air is foulest, that is in general at the highest parts of the room.

I will now mention some points in favour of this last method, and call attention to a new apparatus for applying it.

First of all, it will be noticed that this principle takes advantage of the natural tendency of exhaled air to rise. Secondly, it necessitates a large area of inlets.

This brings us to another point of the greatest importance in the matter of rapid ventilation—the reduction of draughts. I would here draw attention to a point recognised by all practical ventilating engineers, and that is the impossibility of ventilating a crowded room satisfactorily unless the air is warmed before admission. Warming and ventilation are twin sisters and cannot be separated. The introduction of cold air in sufficient quantities to ventilate a crowded room necessarily entails intolerable draughts. Again, it is not generally recognised to what degree enlarging the area of inlet reduces the velocity of air flowing into a chamber. It is well known that if air is sufficiently heated there is scarcely a limit to the velocity of air that can be borne with comfort. But it is undesirable to heat air above a certain temperature. In England the standard temperature of a sick room is 60 degs. Fahr., and in America 70 degs. Fahr., rather less than the latter temperature will be found to be the most comfortable for places of amusement. Different people vary much in the susceptibility to draughts, but with such a temperature a current of air can, by most persons, be comfortably borne up to a velocity of about 2ft. a second. If, now, we have air at this velocity heated to about 65 degs. Fahr., entering evenly through inlets occupying a quarter of one side of a wall, the general current of air through the room will be a quarter this velocity; that is at the rate of half-a-foot a second. This would admit every minute a volume of air equal to the whole capacity of a room 30ft. wide, yet at no part would there be a velocity of more than 2ft. a second. For ordinary purposes a twelfth of this speed would be ample, and the velocity would not at any point exceed 2in. a second, an almost imperceptible movement. Outlets should be arranged upon similar principles. They must be large in area and well distributed about the room, in order to prevent the air flowing directly from the inlets to the outlets without affecting the general air of the room, and when the exits are placed near persons in the room in order to diminish the draught consequent on a rapid outflow of air.

I will now describe a new method of introducing fresh air into a room and conveying it directly to the occupants, and of removing the most vitiated part. This method is the invention of Mr. James Cadett, of Ashtead, and myself. We offer the use of it freely to all charitable institutions, and to all medical men for the treatment of the sick.

First, as regards the distribution of pure air in a room, a conduit is placed just above the floor near the wall, and a tapering longitudinal slot is made in the top of this conduit and baffle plates are placed across the slot. If now air is forced into the end of the conduit at which the slot is widest it will, if the tapering of the slot be properly adjusted flow out of the slot in an even stream up the wall. The reason of this is that as we check the motion of air, its momentum is changed into pressure. But the air rushing along the conduit is most checked at the closed end, and least at the inlet end, hence the pressure is greatest where the slot is narrowest, and there is an even issue of air throughout the length of the slot.

If we place a screen of some perforated material, such as a wire gauze, reaching from ceiling to floor near the wall the sheet of air running between it and the wall will be broken up into a volume of air issuing from the screen and by varying the closeness of the gauze we can vary the amount of air coming out at any part of the screen.

It will be seen that a stream of air running through a narrow conduit has been changed into a volume of air flowing into a room, a thing of one dimension has been changed into one of three dimensions. The conduit and screen can be put in any part of the room, and in practice it will often be convenient to dispense with the screen. In a church for instance, it would often be enough to run conduits with triangular slots along the passages between the seats. The air thus introduced may be warmed, filtered or treated in any desired way. On the outlet side a similar conduit is used, except as the air is freest to enter the conduit near the outlet the slot is made narrowest here. Also in this case baffle plates are unnecessary. If we wish to abstract the air from the room through a screen of perforated material, this screen must be made of closer mesh near the conduit and wider at parts at a distance from it. The outlet apparatus may be put into motion either by forming a plenum in the room or a vacuum in the conduit. In this way, by increasing the area of the inlets and outlets, a very even distribution of air and a very rapid change without causing draughts of any account can be attained.

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* A paper read before the Annual Congress of the Sanitary Institute, held at Southampton on August 29th, 30th, and 31st, 1899.

Every construction of building will require special adaptation of apparatus, and much ingenuity will be necessary to meet the requirements of each particular case, but the control over inlet and outlet possessed by the method just described should enable a skilful operator to solve the most difficult ventilating problems if only he is willing to devote sufficient care to the task.

The last point I wish to touch upon is that of legislative action. At the present moment owners of theatres, concert rooms, restaurants, &c., are granted licences without any stipulation being made for a proper supply of fresh air. Yet most places of public resort are notoriously in such a condition as regards ventilation that they are active agents in the production of disease, especially of chest affections, including consumption. Keenness of competition appears to paralyse all private efforts to remedy the present state of things, and I believe nothing but the interference of the legislature or the action of the local bodies will meet the exigencies of the case. The long sufferance, and I must add, the indifference of the British public as regards its own interest are serious bars to all attempts to move in the matter, but it seems to me this Institute is eminently fitted to take the first step. I will therefore conclude my paper by proposing that before a license is granted for any building of public resort, it should be definitely ascertained that provision is made to admit a standard quantity of fresh air to each person whom the building is intended to accommodate.

PURIFYING WASTE WATER.

AT the meeting of the Institution of Civil Engineers held on January 9th, Mr. Charles Hawkesley (vice-president), in the chair, two papers were read. The first, on "The Purification of Water after its Use in Manufactories," by Reginald A. Tatton, M. Inst. C.E., dealt with the seriously polluted condition of the rivers in the Mersey and Irwell Watershed, which had for many years been the subject of complaint. Although in some instances works for the treatment of sewage and trade waste had been constructed, the matter had not been taken in hand seriously until the formation of the Mersey and Irwell Joint Rivers Committee in 1891.

Some details were given of the purification of the waste from the manufactories of Messrs R. Clay and Sons, Kelsall and Kemp, and Syddall Bros. Messrs. R. Clay and Sons carried on the process of ordinary bleaching, dying and finishing, and the works for purifying the trade waste consisted of precipitation tanks and filters, sludge tanks, presses, &c. The volume of water at times amounted to 500,000 gallons per day; it was treated with lime and "iron alum" and settled in tanks in which most of the suspended solids were intercepted; from these tanks the water was pumped to a second series of tanks for further precipitation, and the clear liquor was finally passed through cinder filters to the stream.

Messrs. Kelsall and Kemp were woollen manufacturers, dyers, and finishers. The trade waste was of a very polluting character owing to the amount of soap used in the scouring processes and the grease extracted from the wool. The waste, containing the grease, &c., was kept separate from the dye-water in the mill, so that it might be treated by itself. It was pumped into a series of three tanks, in which the solids were precipitated by lime and ferric chloride, the clear liquor passing forward through a second series of tanks and filters into the stream; the sludge was discharged on to filters composed of cocoanut matting, and, after it had dried sufficiently, it was pressed and the oil extracted. The dye-water from the mill, to which was added the clear liquor from the grease tanks when they were being drawn off for cleaning, was settled in a series of tanks and filtered. The volume of water dealt with was 180,000 gallons per day.

Messrs. Syddall Bros. carried on the processes of calico printing, dyeing, and bleaching, and the pollution was caused by alizarine, logwood, and other dyes, soap, starch, &c. The total volume of the trade waste amounted to about 70,000 gallons per day; the water from the various departments was collected to a well, whence it was pumped to the purification works, which consisted of a central settling tank and two precipitation tanks used alternatively, each of the latter holding two and a half days' supply; iron alum was used as precipitant. The sludge was drawn from the settling and precipitation tanks into a well, and was thence pumped to a sludge-drying area. The water from the precipitation tanks was finally filtered through fine ashes.

The method of treating the different polluting matters separately should receive special attention, as being undoubtedly the most economical and efficient. The polluting waters from bleachworks might be treated by precipitation in tanks similar to those of Messrs. Syddall, and, if convenient, it was advisable to separate the final wash-water, to reduce the volume, as that water was usually pure enough to be discharged direct into the stream. The water from the keirs, being highly concentrated, should be collected in a separate tank and discharged gradually into the remainder of the water for treatment. The materials used in paper works varied so much that it was impossible to describe a typical purification plant; if esparto grass or straw were used evaporators should be put down, and the soda ash recovered, the wash-water being precipitated in tanks; precipitation tanks were also required at mills where rags, hemp, etc., were used. The more extended use of wood pulp had materially reduced the pollution. The polluted water from tanneries, fellmongeries, and breweries should, if possible, after preliminary treatment, be admitted into the sewers, but if this was impossible, efficient precipitation tanks, followed by filtration or land treatment, were necessary.

The second paper was on "Experiments on the Purification of Waste Water from Factories," by W. O. E. Meade-King, M.I.C.E. It was hoped that comments would be made on the use of salt water as an addition to certain precipitants for the purpose of causing rapid precipitation. The author was not aware that any such treatment had been previously tried, and it was such a simple expedient that, even if it proved a failure when tried on a large scale, its trial could have no injurious effect either on the works or the pockets of the manufacturers. Rapid filtration was considered an essential point, owing to the probability of there being only a very limited area in which to put down purification works, and the experiment showed that this could be obtained by having three or four mediums (all of the simplest description), with a space of a few inches between each, so that the liquid, instead of being held up in the filter, had practically a free passage. At the same time it was aerated and was acted upon by the mediums sufficiently to turn out an effluent to all appearance clean and pure, and free from smell.

It was announced that sixteen associate members had been transferred to the class of members, namely: Messrs. G. C. Buchanan, H. Brunlees, D. Clerk, G. P. Culverwell, B.A., B. H. Henderson, E. J. Lovegrove, I. S. McKie, T. L. Miller, E. W. Monkhouse, M.A., C. B. Newton, M. F. Roberts, R. J. Scott, R. S. Strachey, J. Thompson, B.E., L. F. White, C. H. Wordingham. It was also reported that sixteen candidates had been admitted as students.

The monthly ballot resulted in the election of five members, namely: F. W. Bidder (Nottingham), J. P. O'Donnell (Westminster), M. W. Parrington (Monkwearmouth), J. B. Porter (Montreal), B. Thornhill (Lumding, Assam); nineteen associate members, and one associate.

ANCIENT TIMBER STRUCTURES.*

By JOHN DAVIES.

MOST, if not all, of the timber-built structures remaining in this country to-day can be classed under three separate heads—churches, dwelling-houses, and barns. I propose now to deal with only two of these three, the first and the last, as I have not had the opportunity to make a personal examination of timber dwelling-houses, and I prefer to deal with what I have seen and examined for myself, as far as possible.

Of timber churches we have several good examples in excellent preservation, in which divine service is regularly held. In early times they were known as "stave kirks," and, taking everything into consideration, this name was a very appropriate one. Legend is responsible for the statement that the first Christian church built in this country was a timber-wattle structure built by St. Joseph of Arimathea at Glastonbury. Several churches were built here before the twelfth-century church, the beautiful ruins of which are in existence to-day; and of these, two of them at least appear to have been timber ones. No doubt all the early Celtic churches were of timber, and the same might be said of the early Saxon churches as well. According to the Venerable Bede, the Church of St. Peter the Apostle at York in 627 was built of timber, and Bishop Finan, of Lindisfarne, in A.D. 652 built a church there; "yet, after the manner of the Scots, he made it not of stone, but of hewn oak, and covered it with reeds." Ingulphus informs us that Croyland Abbey was originally built of logs and planks, and roofed with lead. One of the best existing proofs that the early churches of this country were timber built is that most of the pre-Norman ones bear unmistakable evidence of the influence of timber construction. The tower of Earl's Barton is without a doubt the finest example. When I visited this interesting church a few years ago I was astonished at the faithfulness of the copy; the upright pilasters, horizontal bars, and diagonal strips are nothing else than correct imitations of sills, studs, and heads of a timber partition properly braced. The baluster shafts in the openings are also palpable imitations of wood turned work. Those who wish to pursue this question further may do so by visiting such well-known churches as Sompting, Sussex; Bradford-on-Avon, Wilts; Corhampton and Martyr's Worthy, Hants; and Worth, Sussex.

But to return to the stave kirks, the oldest and one of the best preserved in this country is Grinstead Church, close to Ongar, in Essex, and it is a curious and highly interesting little church with timber walls. It is a most singular relic of the Saxon era, and a unique example of primitive timber construction. This church takes us a long, long way back towards the first churches of wattle-and-daub kind, in which the Christian Ancient Britons worshipped, and towards structures of a similar character that were brought to light about three years ago by the discovery of the lake village close by Glastonbury. It is generally conceded that the church was built in great haste, and during a time of panic, to shelter the remains of St. Edmund during the Danish invasion of 1013.

Its oldest portion is undoubtedly the nave, and this is built of half trunks of oak or chestnut, fitted and fixed into a sill; the top end is similarly fitted into a headpiece, which in its turn supports the principals of the roof. The whole bears a very strong resemblance to palisade work, which our forefathers may have used for defensive purposes. The nave is only 30ft. long and 15ft. wide, and is exceedingly low. Originally, however, it may have been about a foot or so higher than it is to-day, as, when Wyatt restored it about forty years ago, the bottom of the uprights were in a decaying state and he decided to have them cut shorter. Each piece, however, is said to have been replaced in exactly the position it occupied previous to its removal.

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* A paper read on December 11th last before the Clerks of Works Association of Great Britain.

At present there are two doorways, both on the south side; one leads directly into the older part, and the other into the fifteenth century chancel, which is built of bricks. There is a small western tower, built of timber, with fir weather-boarded covering painted white, which is a veritable nightmare, out of harmony with its entire surroundings and even with itself, detracting from the character of the church, and threatening to have a similar result on the character of any intelligent observer who has any sense of propriety in matters artistic.

Light is introduced into the nave by dormers in the roofs; there are three on each side. None of them are original; still, I have no doubt whatever that the church originally received its light in that way. There may have been a window in the east end as well; but as the sides of the building were very low, it is certain that there never were any windows there, as the pre-Norman churches were lighted from windows placed very high, close to the eaves in fact. No doubt greater security and more freedom were given to the worshippers in those turbulent days by adopting such a method of obtaining light, and, should they ever be called upon to use them as fortresses, there were fewer points of weakness to guard against when the Danes or other enemies made a descent into their country. It is worthy of notice that the Early English church at Ongar, close by, is also partially lighted by dormers in the roofs; this looks very much as if the thirteenth century people saw some distinct advantage in what had been done by the eleventh century folks close by.

Shenfield Church, also in Essex, has some very interesting specimens of timber work left in it; the clustered shafts between the nave and aisles, as well as the arches between the shafts, are all of oak, and the rood screen and roof are of dark oak. The whole interior is carved, and presents a remarkably rich and pleasing appearance, which increases when it is realised that the work is really in timber and not in stone. Another interesting church in the same county that ought not to be missed is Stock Church. The whole of the west front and the steeple is of oak, and at a distance would be mistaken for a stone front of the Decorated Period. The whole is very ingeniously carried out, and is well worth a visit, if only as an object lesson in construction, as all the joints, &c., are exceedingly well arranged and thought out.

Blackmore Church, also in Essex, has a very interesting tower, built in three receding stages. The two upper ones only are of timber, and the lower of these has the staves arranged vertically, as at Grinstead; in the upper one they are placed horizontally. Each storey has a projecting roof and there is a spire. Margaretting Church also ought to be visited on account of the timber work of its tower. Chessington Church, Surrey, is another near London which is very interesting for many reasons to the archæologist and antiquarian; at present, however, it only interests us on account of its oak piers and timber work overhead, which separate the nave from the south aisle. It is very probable that the above churches were once all of wood.

This brief notice of "stave kirks" cannot be completed without reference to some examples in Cheshire. First, there is the twelfth-century church of Lower Peover. This is what we are in the habit of inaccurately describing as "half-timbered work," and is an excellent specimen of its class; it is of that particular type that served as a model to the stone builders of Earl's Barton, and which they so successfully copied in stone. The whole edifice is built on a low dwarf wall, and on this the sill is bedded, uprights being fixed every few feet. Then comes another horizontal rail on which the windows rest. A little above the window heads is another rail, placed midway between the window and the overhanging eaves. Diagonal struts are fixed between each upright and the rail above; and between the windows these struts are repeated and arranged to form lozenge-shaped panels, the intervening spaces between the timbers being filled up with plaster work. The church has a nave and aisles, and the latter extend back to the extreme end of the chancel. With the single exception of the tower, the whole is built of timber. Marton Church was built in the fourteenth century; here the belfry is also of timber and is an interesting example of the ingenious application of timber to form a rigid self-contained structure. Oak shafts separate the nave from the aisles, and oak arches connect the shafts and support the roof timbers overhead.

Taking the inflammable character of these buildings into consideration, it is surprising that so many of them now remain. Some of them connect us with the past—the past before the Conqueror and Harold and Hereward the Wake. There are, however, some types of buildings which antedate the oldest of "stave kirks" by many centuries; types that existed in Britain before the coming of not only the Dane and the Saxon, but of the Roman as well. These no doubt were first built in Britain by our Brythonic ancestors, who must have been excellent craftsmen in wood, judging by the remains recently discovered on the site of the lake village at Glastonbury, and by the interesting book of Keller on the lake dwellings of Switzerland, for these also were built by the same branch of the Aryan family in that great westward emigration towards the land of the setting sun.

In the year 400 B.C., Pytheas, a Greek mathematician, visited this country, and, after returning home, he reported among other things that "the natives collect their sheaves in great barns and thrash out the corn there, because they have so little sunshine there that our open thrashing-places would be of little use in that land of clouds and rain." No doubt this is the very first authentic instance we have of British barns.

With the advent of the Brythonic people in this country, the Iron Age began, although the Goidelic branch of the Aryan family had preceded them; still, it is generally conceded that the latter were not acquainted with the new metal. And yet the Brythons must have used it very sparingly—in their buildings, at any rate; for to this day our old barns are practically held together by trenails. Do not misunderstand me. I am not going to say that any of the barns we are going to deal with are of that age; probably none of them are more than 400 years old, but I do believe, strongly, that they are all constructed on that ancient pattern.

The most important barn left to us now, from the point of view of size, is the "Great Barn" at Harmondsworth, Middlesex. It is 192ft. long, and 38ft. 8in. wide, and the whole structure rests on a low dwarf wall, built of the conglomerate stone of the locality. The whole of the framework and vertical weather boards are of oak or chestnut; it is exceedingly difficult at times to distinguish the one from the other. Internally, it is divided in the usual way into a nave and two aisles, the latter being again subdivided into bays of 16ft. centres each; this gives just twelve bays to each aisle. These bays originally played a very important part in the barns of long ago; and we must travel to the great table-lands of Media, to the very cradle of the Aryon family, to find what will no doubt prove to be the prototypes of these very interesting old buildings. In Viollet le Duc's "Habitations of Man," is an admirable illustration of the Median House and also one of the Mesopotaman House in Mrs. Lineham's book, "The Street of Human Habitations;" these are the very buildings from which grew our barns, and probably through the latter our basilican churches as well.

All these barns are remarkably alike; any difference that does exist is merely a difference of detail. For instance, I have never seen one yet with true roof principals. The rafters in all cases are strutted up from the tie pieces that help to keep the uprights of the nave in position. The Harmondsworth example is also known as the "Gothic Barn," because the braces between the various members of the framework have been selected out of very crooked material, sawn down the middle and put together in couples, so as to form a series of somewhat rude-pointed arches—hence I presume the term "Gothic Barn." There is a very interesting survival of primitive timber construction in the upper end of all the principal uprights of this building, which shows very clearly how these old craftsmen clung to traditional methods of construction. In this and in several other barns the tops of the uprights are from 4in. to 6in. wider one way—*i.e.*, in the direction of the width of the building—than they are at the bottom. In this case they are sawn from about 1ft. 6in. square at the top to about 10in. by 10in. for most of the way down. They look like a huge diminished door stile purposely placed upside down. There is no need whatever for it in any of the cases I know; yet in most instances the whole of the timber has been tediously chopped away with the axe, because most of these old barns were built before the pit-saw was in general use, if in use at all.

And why was all this labour uselessly expended in this way? It seems to me that they were simply victims of precedent, as in earlier times the forked undressed trunk of a tree would do duty in a similar position, and, of course, at the fork the trunk expanded in a perfectly natural way, and in order to imitate this the mediæval carpenter chopped or sawed the tree away as described above. In the "Ancient Laws of Wales" full particulars are given, with a schedule of prices, of the various parts of the Tribal Hall, and also of the houses of the tribesmen. Again, Mr. Gomme, in "The Village Community," instances the case of "Gatacre Hall, in Shropshire, that was in existence up to about eighty or ninety years ago. It was nearly an exact square. At each corner and in the middle of each side and in the centre was an immense oak, hewed nearly square and without branches, set with its head on large stones laid about a foot deep in the ground, and with its roots uppermost, which roots with a few rafters, formed a complete arched roof." Now, in both these instances the uprights supporting the roof expanded considerably at the top, and I have no doubt that the expanded top of the barn uprights in question is a survival of the old types mentioned above.

I have stated that I have never seen a timber barn with true principals, and I doubt if one was ever built, because such a thing never occurred in the types they blindly followed and accepted as examples, right away back to the prototypes in Media. The strong, bold and original man, who breaks away from traditional notions and accepted ideas, never came, with the result that the last built is much the same as the first, so far as we are aware. The bays that the aisles were subdivided into were regarded as units of construction, and the barn would be described as one of so many bays. In Gloucestershire, and, possibly, other parts of England, bays were separately rented. Shakespeare alludes to this custom when he makes Pompey say, "If this law holds good in Vienna ten year I'll rent the fairest house in it after three pence a bay." In referring to Mr. Halliwell's notes in my edition I find that he has altogether failed to grasp the full significance of the passage. For he says: "A bay was a principal division in the architectural arrangement of a building. It seems out of place here, and I half suspect the poet wrote day." But the poet wrote nothing of the kind; he wrote bay, and meant it, as it was quite a common practice in his time. I believe all these barns are the lineal descendants, so to say, of the old tribal homes of the past, and they represent that period in our economic development when the chief and his family lived in the hall (the nave) surrounded by his dependents, with his harvest gathered and housed in the "upper end," and his cattle in the bays of one aisle and the horses in the other; thus was he always in a position to protect his property. Most of the early English romancists, and the Welsh bards as well, make frequent allusions to such a state of things.

Master Painters' Association of Ireland held its annual convention last week at Belfast.

Masters and Men.

Building Crisis in Edinburgh.—We referred last week to a very serious building crisis that has arisen at Edinburgh, resulting in two firms having to suspend payment. One of them, Mr. James Slater, of 172, Easter Road, is probably the largest speculative builder in the city, and his liabilities, it is stated, will probably be not under £100,000. The failures have caused quite a panic throughout the trade. The speculative building trade has been carried to reckless heights in Edinburgh during recent years, builders and others having rushed into building schemes with quite inadequate capital, obtaining advances over every foot of the buildings as they were built. Dwelling-houses were sold on the instalment principle, the builders finding their profits in the difference between the rate of interest paid by the purchasers and the rate at which they, the builders, borrowed the money. The recent high bank rate has, however, wiped out this margin of profit, and the big increase in the price of materials has also helped to cause disastrous results. The serious state of affairs has caused the Edinburgh and Leith Master Builders' Association to unanimously resolve to reduce the wages of the operatives in the various trades at least 1d. per hour, which will mean about 4s. less per week. The reduction of wages affects masons, joiners, brickbuilders and plumbers, but will not come into operation for some time yet, for according to the agreement with the Masters' Association the joiners got three months' notice of any change before the 15th of this month; the masons get two months' notice, from April 6th; the brickbuilders, notice to be given before February 1st, the change to take effect on May 1st; and the plumbers to receive notice by March 1st, to take effect on June 1st. It is hoped that as there is a good deal of building work of a non-speculative character, matters will not turn out so bad as indications point at present.

The Yorkshire Building Trade.—The second annual meeting and dinner of the Yorkshire Federation of Building Trade Employers took place last Thursday. At a business meeting previous to the dinner, Councillor W. Nicholson, of Leeds, was elected president, and Mr. G. H. Walters, of Hull, and Mr. James Longden, of Sheffield, were elected vice-presidents. The alteration of the rules so that the members of the Council shall be elected from the county associations, and not self-appointed as at present, was also approved of by the meeting. Mr. James Townsley, of Hull, who submitted the toast of "The Yorkshire Federation of Building Trades" at the dinner, in alluding to the struggles of the past year, said he did not think there would be any lock-out for some time to come in Hull. It was not that they were afraid of that sort of thing, but the employers had learned many lessons, as had also the workmen. After the struggle was over, they would settle down with a better understanding between capital and labour than had previously existed. They had been brought somewhat nearer to labour right throughout the country, and out of this closer touch a very great deal of good would come. He believed firmly in federation, and quite apart from labour questions, their Federation before the strike commenced was doing good work—as, for example, that of gaining advantageous concessions from the architects. The advantages thus gained had made building life much pleasanter and happier, and builders in turn, he trusted, were striving to do what they could to assist the architects in their professional duties. The president, in response, said the present was a most trying time in the building trade. Since contracts were entered into some time ago there had been an enormous increase in the prices of material. Iron girders had advanced from £6 to £8 15s. per ton, and timber from 50s. to 75s. per load of 50ft., and Swedish, Norwegian, and Russian timber in proportion. This increase in the prices of building material, combined with the extremely high rate of wages which prevailed, would, he was afraid, seriously check the industry in which they were interested. Upon one matter there was unfortunately a difference of opinion: If they did not make good men by way of apprentices, how could they expect the work to be properly done seven or eight years hence? What they, as a Federation, should recommend was that every master was bound in honour to supply as many men as he could for the coming years. Every boy who went to a master must be legally bound, every chance must be given to the boy to turn himself out a skilful workman and worth the standard rate of wages. Any employer who did not do that was not doing justice to the building trade. Then there was the question of the foremen, who were the representatives of the employers. The policy of the trade unions had been to compel foremen to join the men's unions. What chance, therefore, had the employers to carry on their business successfully? The foremen must be freed from any baneful influence, and the Executive hoped shortly to put forward a scheme by which the Federation would be able to give the foremen better conditions than the masters individually could. The toast of "The Architects, Engineers and Surveyors of Yorkshire" was given by Mr. W. R. Thompson (Dewsbury), and acknowledged by Mr. W. S. Braithwaite and Mr. F. Bowman.

Engineering Notes.

Sudbury is proposed to be lighted by electricity. The cost of the undertaking would be £16,300.

Fulwood Workhouse is proposed to be heated and lighted by electricity. The cost is estimated at about £13,472.

For Electric Lighting Extensions at Oldham the Corporation propose to borrow another £36,000. The total capital expenditure to date is £57,109. A Local Government Board inquiry has been held.

Sheffield Electric Lighting.—Of the £100,000 which the Corporation desired to borrow for electric lighting purposes, the Local Government Board has sanctioned £71,120, leaving the remainder for further consideration.

Cost of Artesian Borings.—For providing lifting tackle for the pump rods in the old artesian boring at Gainsborough, the Urban Council has accepted a tender of £1,189. The revised estimate of the consulting engineer, Mr. Percy Griffith, for the new or second boring is, exclusive of boring cost, as follows:—Engine-house and foundations, £2,250; travelling crane, £300; pumping machinery, £5,000; engineer's commission and expenses, £300; legal expenses and contingencies, £550; total, £8,400.

Electric Light and Traction for Wigan.—On January 4th the Mayor of Wigan (Councillor J. T. Gee) laid the foundation stone of the new power station in connection with the electrical undertaking of the Wigan Corporation. The proposals of the Corporation involve the expenditure of £85,000 for the purposes of electric lighting, and £40,000 on two lines of tramways, whilst the probable expenditure in the future will include the working by traction of the whole of the Wigan and district tramways, making a total capital outlay of between £300,000 and £400,000.

London Gas.—The directors of the South Metropolitan Gas Company propose to abolish the existing sliding scale based on the price charged for gas, and to substitute a new one which will form three divisions in the price, as follows:—(1) For gas supplied with a power of 16 or more candles, 3s. 3d. per 1,000 cubic feet; (2) for gas with a power of 15 and under 16 candles, 3s. 2d. per 1,000 cubic feet; (3) for gas with a power of 14 and under 15 candles, 3s. 1d. per 1,000 cubic feet. The price which will be actually charged to the consumer, as regulated by the illuminating power, will "be the average of all the official testings made during each half-year."

Ball's Bridge, Dublin.—A correspondent to the "Irish Times" says that about fifteen months ago the Commissioners advertised for plans for widening Ball's Bridge. A premium was awarded, but the lowest tender is more than double the engineers' estimate. The matter is now at a deadlock between the tramway company and the Commissioners. "As a professional man," continues the correspondent, "I have no hesitation in saying that any form of cantilever or bracketed footpaths which would give from 10ft. to 12ft. in the clear outside the existing bridge, allowing the full width between the present parapets for road traffic, would be the most inexpensive and, at the same time, most practical method to adopt."

Surveying and Sanitary Notes.

Harwich Sea Wall Defence.—The tender of Messrs. Smith and Son, of Witham, amounting to £1,250, has been accepted for making up Stair Street, Harwich, in order to form a sea-wall defence.

Sanitary Institute.—On January 19th the first of the series of lectures and demonstrations for sanitary officers (29th course) will take place at the Parkes Museum, Margaret Street, Regent Street, W. Full particulars may be obtained from the secretary at the above address.

Contracts for the Morecambe Sewerage Scheme have been let, the first section going to Messrs. J. Schofield, Sons and Co., Leeds, for £66,500, and the second section to Mr. Enoch Tempest for £9,356 11s. 4d. The engineers are Messrs. Beesley, Son and Nichols, of Westminster, S.W.

Institute of Sanitary Engineers.—At a meeting of the Election Committee held on January 10th, Mr. J. Preece James, of Tenby, was elected a fellow; Mr. K. D. Subramani Aiyar, of Madras, was elected as member; and Mr. R. W. Watts, of London, and Mr. J. Lennard, of Brentford, were elected associates.

"Streets" with Significant Names.—To accommodate the large number of prisoners in Pretoria, three vast sheds, two miles long, resembling streets, have been constructed to the north of the town. They are the work of a Belgian architect, and are called respectively Ladysmith Street, Kimberley Street, and Mafeking Street.

Sweeping away the Old.—The City Corporation propose to form two new streets on their "John Carpenter" estate adjoining Tottenham Court Road. One would cut through North Crescent and come out opposite Tottenham Street, and the other through South Crescent and come out opposite Windmill Street, thus practically abolishing the two old-fashioned crescents, and continuing Alfred Place at each end, by an angular bend, into Tottenham Court Road. The neighbourhood is old, and the Corporation property can be distinguished by the City arms on the fronts of the houses, which were built between 1790 and 1814.

Bristol Main Drainage Scheme.—In reference to the scheme for taking the sewage out of the river Avon at Bristol, upon which a poll of the city is to be taken (as reported in last week's issue), it is stated that the proposed expenditure will amount to a rate of from 4d. to 6d. in the £ for forty-five years, in addition to which there will be required about £2,500 a year for pumping and a considerable sum for machinery renewals. The proposed sewer would pass under Shirehampton by tunnel and then cross the flat land to Avonmouth (the sewer being 10ft. above the level of the land on each side) to a point near Avonmouth Hotel. At a short distance from this hotel it is proposed to erect a tank, covering eight acres, into which the sewage of perhaps a population of 500,000 persons would accumulate for hours at every tide.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—		
Jan. 19	Brighton—Conveniences	Corporation	F. J. C. May, Town Hall, Brighton.
,, 19	Halesowen—Hospital	Hospital Committee	A. T. Butler, Architect, High-street, Cradley Heath.
,, 19	Leeds—Wall	Corporation	City Engineer's Office, Municipal-buildings, Leeds.
,, 19	Hull—Disinfecting Station	Corporation	A. E. White, City Engineer, Town Hall, Hull.
,, 20	Sheffield—Nurses' Home	Guardians	Union Offices, Westbar, Sheffield.
,, 20	Ardara, Ireland—Manse	....	J. M. Robinson, 7, James street, Omagh.
,, 20	Hull—Public Library	Corporation	J. S. Gibson, 4, Gray's Inn-square, W.C.
,, 20	Ashburton, Devon—House	....	Whiteway and Foot, Ashburton.
,, 20	Londonderry—Residence	....	J. P. M'Grath, 28, Carlisle-road, Londonderry.
,, 20	New Holland, Lincs.—Church	....	The Yarborough Hotel, New Holland.
,, 22	Blackburn—Hospital Extension	Health Committee	W. Stubbs, Engineer, Municipal Offices, Blackburn.
,, 22	Frizington, Cumberland—Alterations	Cockermouth Building Society	W. Labourne, Yeathouse Road, Frizington.
,, 22	Kidderminster—Additions	Health Committee	Arthur Comber, Borough Surveyor.
,, 22	London, W.—Builders' Work	Paddington Vestry	F. Dethridge, Vestry Clerk, Vestry Hall, Harrow-road, W.
,, 22	Silloth, Cumberland—Alterations	Rev. R. Walker	Rev. R. Walker, St. Paul's Rectory, Silloth.
,, 22	Wrexham—Destructor	Town Council	W. H. Trentham, 39, Victoria-street, Westminster.
,, 22	Wrexham—Alterations	Town Council	Borough Surveyor, Guildhall, Wrexham.
,, 23	Lewisham—Public Lavatories, &c.	Board of Works	Surveyor, Lewisham Town Hall, Catford, S.E.
,, 23	Manchester—Urinals	Sanitary Committee	City Surveyor, Town Hall, Manchester.
,, 23	Devonport—Station	Great Western Railway Co.	Engineer, Plymouth Station.
,, 23	Leeds—Repairs	School Board	W. Packer, Clerk, Board's Offices, Leeds.
,, 23	London, E.—Offices	Great Western Railway Co.	Engineer, Paddington Station.
,, 23	Southport—Booking Office	Lancashire and Yorkshire Railway Co.	Engineer, Hunt's Bank, Manchester.
,, 24	Heaton, near Newcastle-on-Tyne—Houses	North Eastern Railway Co.	W. Bell, Architect, Central Station, Newcastle-on-Tyne.
,, 24	Londonderry—Alterations	Mr. Neal Craig	J. P. M'Grath, 28, Carlisle-road, Londonderry.
,, 25	Knutsford—Chapel	Urban District Council	R. J. Macbeath, Architect, Birnham House, Sale.
,, 25	Pwllheli, Wales—Town Hall	Town Council	A. J. Dickson, Surveyor, Church-place, Pwllheli
,, 26	St. Pancras—Baths and Washhouses	Vestry	T. W. Aldwinckle, 1, Victoria-street, S.W.
,, 27	Brambridge, Hants.—Bridges	Hursley Rural District Council	Lemon and Blizard, Lansdowne House, Castle-lane, Southampton.
,, 27	Wigton—Rebuilding Hotel	....	G. Armstrong, 24, Bank-street, Carlisle.
,, 27	Marazion, Cornwall—Additions	....	A. C. Jenkin, 3, Parade-passage, Penzance.
,, 29	Sunderland—School	School Board	Office of Board, 15, John-street, Sunderland.
,, 29	Stratford-on-Avon—Wall	Town Council	Boden Dixon, Municipal Offices, Stratford-on-Avon.
	ENGINEERING—		
Jan. 19	Pluck's Gutter, near Ramsgate—Bridge	....	W. A. Valon, Hardres-street, Ramsgate.
,, 20	Ilford—Electric Lighting Plant	Urban District Council	J. W. Benton, Council Offices, Ilford.
,, 20	Oban—Extension of Railway Quay	Callander and Oban Railway Co.	T. M. Barr, Engineer, Northern Division, Caledonian Railway, Perth.
,, 20	Manchester—Reconstruction of Culvert	Paving Committee	City Surveyor, Town Hall, Manchester.
,, 20	Sheffield—Steam Pipes and Condenser	Electric Lighting Committee	W. Johnson, Electric Supply Department, Commercial-street, Sheffield.
,, 20	Brynamman, Wales—Driving Drifts	Gwaun-cae-Gurwen Colliery Co. Ltd.	Gwaun-cae-Gurwen Colliery, Brynamman.
,, 22	Glasgow—Machinery	Corporation	D. Home-Morton, 95, Bath-street, Glasgow.
,, 22	Aberdeen—Dynamo	Electric Lighting Committee	J. A. Bell, City Electrical Engineer, Aberdeen.
,, 22	Ilford—Pumps	Urban District Council	J. Taylor, Sons and S. Crimp, 27, Gt. George-street, S.W.
,, 22	Newquay, Cornwall—Reservoir	Water Company	S. W. Jenkins and Sons, Engineers, Liskeard.
,, 23	Barking—Electric Lighting Plant	Urban District Council	E. H. Lister, Clerk, Public Offices, Barking.
,, 23	London, N.—Laundry Machinery	Holborn Union	J. Buley, Engineer, Suffolk House, Lawrence Pountney Hill, E.C.
,, 23	India Office, S.W.—Locomotives	....	Director-General of Stores, India Office, Whitehall, S.W.
,, 23	Lisburn, Ireland—Boiler	Guardians	W. T. Henry, 24, Railway-street, Lisburn.
,, 23	London, E C.—Travelling Gasholders	Bengal Nagpur Railway Company	Office, 132, Gresham House, Old Broad-street, E.C.
,, 23	London, S.W.—Boilers	Westminster Electric Supply Corporation	Engineer-in-Chief, Eccleston-place, London, S.W.
,, 23	Risca, Mon.—Footbridges	Great Western Railway Company	Engineer, Paddington Station, W.
,, 25	Hastings—Boilers	Guardians	Jeffrey and Skiller, 5, Havelock-road, Hastings.
,, 25	Tunbridge Wells—Steam Alternator	Corporation	Horace Boot, Borough Electrical Engineer, Tunbridge Wells.
,, 26	Valetta, Malta—Waterway in Tunnel at Sea-level	....	Superintendent of Public Works, Valetta.
,, 29	Soyland, Yorks.—Reservoir	Urban District Council	R. Horsfall and Son, Commercial-street, Halifax.
,, 30	Copenhagen—Locomotives	Danish State Railways	Mechanical Department, Colljornsensgade, 6, Copenhagen, V.
,, 31	Ayr—Pumping Plant	Magistrates and Council	J. Young, Town Buildings, Ayr.
,, 31	Plymouth—Electric Lighting Plant	Corporation	R. H. Rider, Prince Rock, Plymouth.
,, 31	Brightlingsea, Essex—Tank	Urban District Council	J. J. Osborn, Clerk, Foresters' Hall, Brightlingsea.
,, 31	Carnarvon—Sinking Shafts	....	J. Williams and Co., Dorothea Quarry Offices, Carnarvon.
,, 31	Ilkeston—Plant	Gas Committee	F. C. Humphreys, Gasworks, Ilkeston.
	IRON AND STEEL—		
Jan. 19	Leeds—Railings	Corporation	City Engineer's Office, Municipal-buildings, Leeds.
,, 22	Nottingham—Railings	Public Parks Committee	A. Brown, Engineer, Guildhall, Nottingham.
,, 23	London, S.W.—Railings	County Council	Park's Department, 9, Spring-gardens, S.W.
,, 30	Great Yarmouth—Rails	Town Council	J. W. Cockrill, Borough Surveyor, Town Hall, Gt. Yarmouth.
	PAINTING AND PLUMBING—		
Jan. 22	Birkenhead—Painting	Guardians	J. Carter, 45, Hamilton-square, Birkenhead.
,, 29	Walsall—Painting	Corporation	Borough Surveyor, Bridge-street, Walsall.
Feb. 5	Manchester—Painting	Lancashire and Yorkshire Railway Co.	Engineer, Hunts Bank, Manchester.
	ROADS AND CARTAGE—		
Jan. 19	Old Trafford, Manchester—Street Works	District Council	Mr. Royle, Council Offices, Old Trafford.
,, 19	Calverley, Yorks.—Road Works	....	G. and G. H. Crowther, 38, New-street, Huddersfield.
,, 19	Monkton and Stourmouth, Ramsgate—Road	....	L. W. Hogbin, Surveyor, Birchington.
,, 20	Banbury—Stone	Town Council	N. H. Dawson, Surveyor, Town Hall, Banbury.
,, 20	Brigg, Lincs.—Granite and Slag	Rural District Council	F. C. Hett, Clerk, Brigg.
,, 20	Uckfield, Sussex—Paving	Urban District Council	Council Offices.
,, 22	Plymouth—Making-up	....	J. Paton, Borough Engineer and Surveyor.
,, 23	London, N.—Works	Tottenham Urban District Council	P. E. Murphy, 712, High Road, Tottenham.
,, 24	Ramsgate—Wood Paving	Corporation	T. G. Taylor, Surveyor, Broad-street, Ramsgate.
,, 27	St. Annes-on-the-Sea—Making-up	Urban District Council	The Surveyor, Park-road.
	SANITARY—		
Jan. 19	Halifax—Draining	....	Buckley and Sons, Surveyors, Tower-chambers, Halifax.
,, 22	Sevenoaks—Sewers	Urban District Council	J. Mann, Surveyor, Council Offices, Sevenoaks.
,, 22	Basford, Notts.—Scavenging	Rural District Council	C. J. Spencer, Public Offices, Basford.
,, 22	Uxbridge—Sewers	Rural District Council	J. Anstie, 10, Marchwood crescent, Ealing.
,, 23	Tottenham—Sewers	Urban District Council	P. E. Murphy, 712, High-road, Tottenham.
,, 25	Walsoken, near Wisbech—Scavenging	Urban District Council	J. Kerridge, 101, Norwick-road, Walsoken.
	TIMBER—		
Jan. 19	Warwick—Wood	Guardians	C. H. Passman, 48, Bedford-street, Leamington Spa.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan. 31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.
Feb. 12	Barnsley, Yorks.—Church and Vicarage	£52 10s., £31 10s., £21	Lancaster and Sons, Church-street, Barnsley.
,, 28	Findochty, Scotland—Harbour Improvements	....	Clerk of Commissioners, Findochty, Scotland.
,, 28	Doncaster—Isolation Hospital	£25, £15	F. E. Nicholson, Solicitor, Union Offices, Doncaster.

Property and Land Sales.

FREEHOLD BUILDING LAND to be LET on LEASE, or SOLD in PLOTS; fronting on main road, and close to golf links and Highgate Woods; near Muswell Hill and East Finchley Stations. Liberal advances if required to responsible Builders.—For plans and particulars apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington Road, N. 5

Sales by Auction for the Year 1900.—Messrs.

DEBENHAM, TEWSON, FARMER, and BRIDGEWATER beg to announce that their SALES for 1900 of ESTATES, Investments, Town, Suburban, and Country Houses, Business Premises, Building Land, Ground-rents, Advowsons, Reversions, Stocks, Shares, and other Properties will be held at the Auction Mart, Tokenhouse-yard, near the Bank of England, in the City of London, as follows:—

Tuesday, January 30th
Tuesday, February 13th
Tuesday, February 20th
Tuesday, February 27th
Tuesday, March 6th
Tuesday, March 13th
Tuesday, March 20th
Tuesday, March 27th
Tuesday, April 3rd
Tuesday, April 10th
Tuesday, April 24th
Tuesday, May 1st
Tuesday, May 8th
Tuesday, May 15th
Tuesday, May 22nd
Tuesday, May 29th
Tuesday, June 12th
Tuesday, June 19th
Thursday, June 21th
Tuesday, June 26th
Thursday, June 28th
Tuesday, July 3rd
Thursday, July 5th
Tuesday, July 10th
Thursday, July 12th
Tuesday, July 17th
Thursday, July 19th
Tuesday, July 24th
Thursday, July 26th
Tuesday, July 31st
Tuesday, August 14th
Tuesday, October 9th
Tuesday, October 23rd
Tuesday, October 30th
Tuesday, November 13th
Tuesday, November 20th
Tuesday, December 4th

By arrangement, Auctions can also be held on other days in town or country. Messrs. Debenham, Tewson, Farmer, and Bridgewater undertake Sales and Valuations for Probate and other purposes of Furniture, Pictures, Farming Stock, Timber, &c.

Detailed Lists of Investments, Estates, Sporting Quarters, Residences, Shops, and Business Premises to be Let or Sold by private contract are published on the 1st of each month, and can be obtained of Messrs. DEBENHAM, TEWSON, FARMER, and BRIDGEWATER, Estate Agents, Surveyors, and Valuers, 80, Cheapside, London, E.C. Telephone No. 503, Bank.

SALE DAYS for the Year 1900.
Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, January 25th
Thursday, February 8th
Thursday, February 22nd
Thursday, March 8th
Thursday, March 22nd
Thursday, April 5th
Thursday, April 26th
Thursday, May 10th
Thursday, May 24th
Thursday, June 7th
Thursday, June 21st
Thursday, June 28th
Thursday, July 5th
Thursday, July 12th
Thursday, July 19th
Thursday, July 26th
Thursday, August 2nd
Thursday, August 9th
Thursday, September 27th
Thursday, October 11th
Thursday, October 25th
Thursday, November 8th
Thursday, November 22nd
Thursday, December 6th
Thursday, December 13th

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

FOR SALE (within four miles of Hyde Park, W., on main road, W.), FREEHOLD MODERN MANSION in 2½ acres of park-like land. Excellent construction. Noble entrance hall, four grand retaining-rooms, oak carving, polished parquetry floors, billiard-room, 14 bedrooms, besides extensive domestic offices and servants' rooms, stabling, conservatories, and outbuildings. Suitable for gentleman's residence, college, club, or public institution. Additional land adjoining may be acquired.—Apply to W. H. GIBBS and Co., nearly opposite West Kensington Station, W.

By order of the London County Council.—Tottenham Court-road Widening and Bozier's-court.

MESSRS. HORNE and CO. will SELL by AUCTION, on the PREMISES on FRIDAY, JANUARY 19th, 1900, at HALF-PAST ONE, the MATERIALS of the HOUSES and SHOPS, Nos. 3, 4, and 5, Tottenham Court-road, and the "A 1" public-house, No. 2, Oxford-street, comprising brickwork, slates, timber, plate glass and other sashes, shop fronts, doors, chimney pieces, partitioning counters, lead gutters, cisterns and pipes, stoves, ranges, public-house fixtures and utensils, and numerous fitiings-up. May be viewed morning of sale.

Catalogues had on the Premises and of HORNE and Co., 8, Delahay-street, S.W., and 85, Gresham-street, E.C.

HAMMERSMITH-ROAD, W.—Important Building Site.—Preliminary Notice of Sale by Auction.—Messrs.

CHESTERTON and SONS are instructed to SELL by AUCTION at the Mart, E.C., on THURSDAY, JANUARY 25th, 1900, at TWO o'clock, the valuable FREEHOLD PROPERTIES, Nos. 92, 98, 100, 102, 104, 106, 108, Hammersmith-road, together with Forty-seven Cottages and the Black Horse Beerhouse, in Brook Green-place at the rear, the whole forming an excellent building site of over 1½ acres. Also the valuable FREEHOLD INVESTMENT, No. 46, Brook-green.

Particulars of Solicitors, Messrs. MILLER, SMITH, and BELL, 3, Salter's Hall-court, Cannon-street, E.C.; Messrs. HASTIES, 65, Lincoln's Inn-fields, W.C; H. P. SMALLPIECE, Esq., Guildford; Messrs. SHORE and KING, Birmingham; E. F. DAY, Esq., Nos. 5 and 6, Clement's-inn, W.C.; and Messrs. CROWDERS and VIZARD, 55, Lincoln's Inn-fields, W.C. Auctioneers' Offices, 51, Cheapside, E.C., and 140, Kensington High-street, W.

R.I.B.A. EXAMS. PREPARATION, personally or by correspondence, in three, six, nine, or twelve months' courses. Architectural Lending Library. Special three months' finishing courses.—For full particulars apply to Messrs. HOWGATE and BOND, Associates R.I.B.A., Perchard House, 70, Gower-street, W.C. (close to the British Museum

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MODELS.
For Exhibitions or Law Cases.
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JOHN B. THORP, 98, Gray's Inn-road, W.C.

R.I.B.A., Society of Architects, and Civil Service Technical Examinations. Personal, correspondence, or resident preparation. Seventeen first places.—MIDDLETON and CARDEN, Associates R.I.B.A., 19, Craven-street, W.C.

THE PARTNERSHIP of Messrs. Thompson and Greenhalgh, Architects and Surveyors, has been DISSOLVED for about eighteen months, and Mr. Greenhalgh has now taken as Partner Mr. P. Brockbank, late of the firm of Green and Brockbank, Liverpool. Messrs. Greenhalgh and Brockbank continue the offices at Bank-chambers, Southend-on-Sea, which were occupied by Messrs. Thompson and Greenhalgh. 1

IMPORTANT BUILDING SITES.—Upper Sydenham, Kirkdale, and Peak Hill, 5½ acres, roads on three sides, suitable for shops and private houses. Five minutes from Sydenham Station, L. B. and S. C. Ry. Also 97, Perry-hill, Catford, two roads. Other BUILDING LAND to be LET at Forest Hill and Barnet, leases 80 years direct from freeholders.—Offers may be sent to Mr. H. PORTER, Surveyor, 16, Russell-square, W.C.; or to the undersigned, W. ARNOLD HEPBURN, Clerk to the Leathersellers' Company, Leathersellers' Hall, St. Helen's-place, E.C.

APPOINTMENTS VACANT.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two.

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Six Lines or under	6	0
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(*The Average is Seven Words to a Line.*)

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Adamant Urinal Range

INSIDE SIZES.

	Height.	Width.	Depth.
Large	48in. ...	25in. ...	16in.
Medium ...	42in. ...	20in. ...	13in.

Non-absorbent, superior to Marble or Slate.

SIZE OF RANGE OVER ALL.

Three Persons as shown.

	Length.	Height.	Depth.
Large ...	7ft. 3in.	5ft. 2in.	1ft. 7in.
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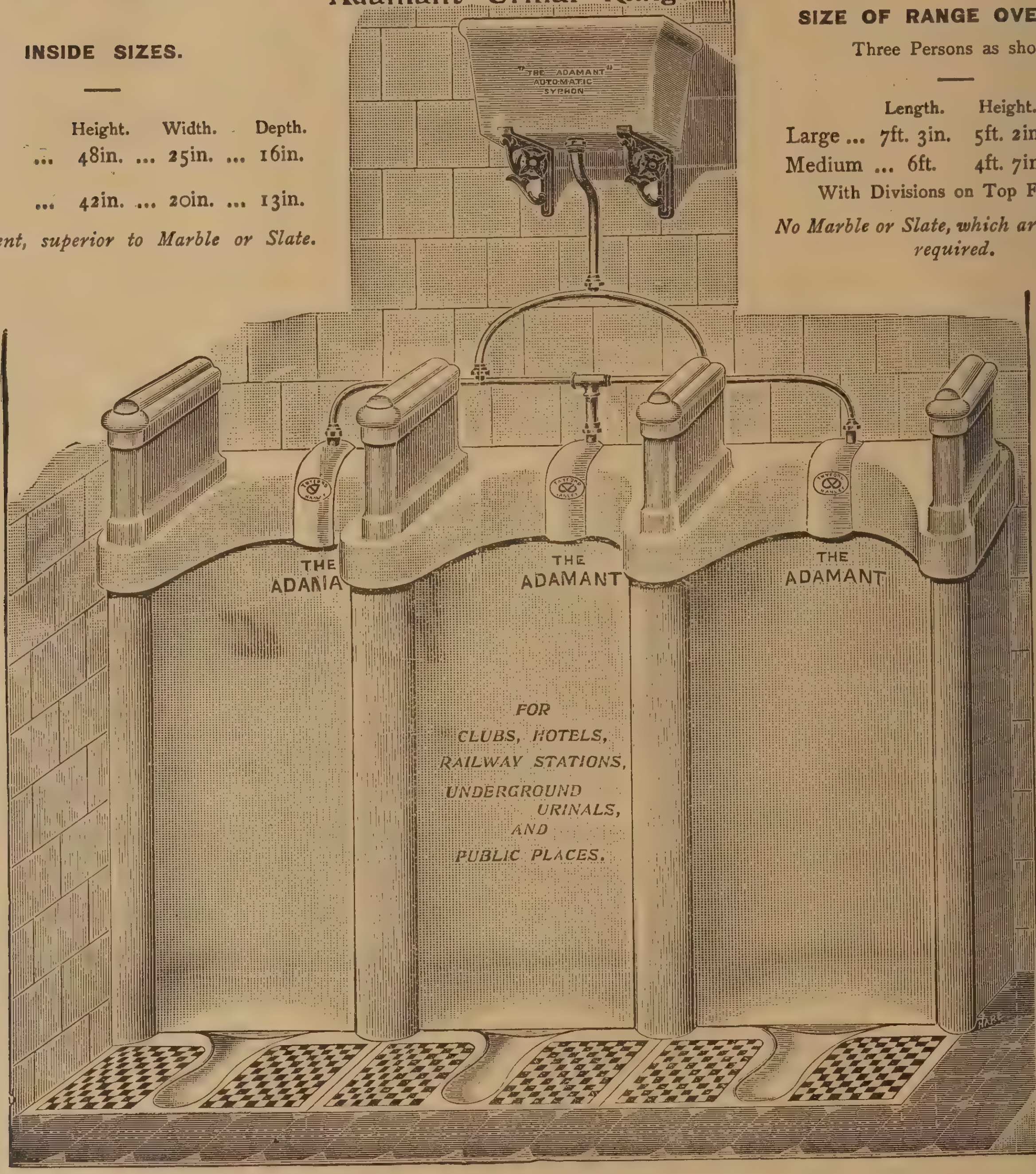
With Divisions on Top Facings.

No Marble or Slate, which are absorbent, required.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PRICES.	LARGE.	MEDIUM.
For Two Persons	£19 11 0 ...	£14 19 0
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For Four Persons, „ ...	38 0 6 ...	28 15 6
For Five Persons, „ ...	46 7 6 ...	34 16 0
For Six Persons, „ ...	56 4 0 ...	42 6 0

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Quotations given for Ranges for any number of persons.

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THE BUILDERS' JOURNAL & ARCHITECTURAL RECORD
WITH SURVEYING AND SANITARY SUPPLEMENTS.

JANUARY 24, 1900.
No. CCLIX.

EFFINGHAM HOUSE,
ARUNDEL STREET,
STRAND, W.C.

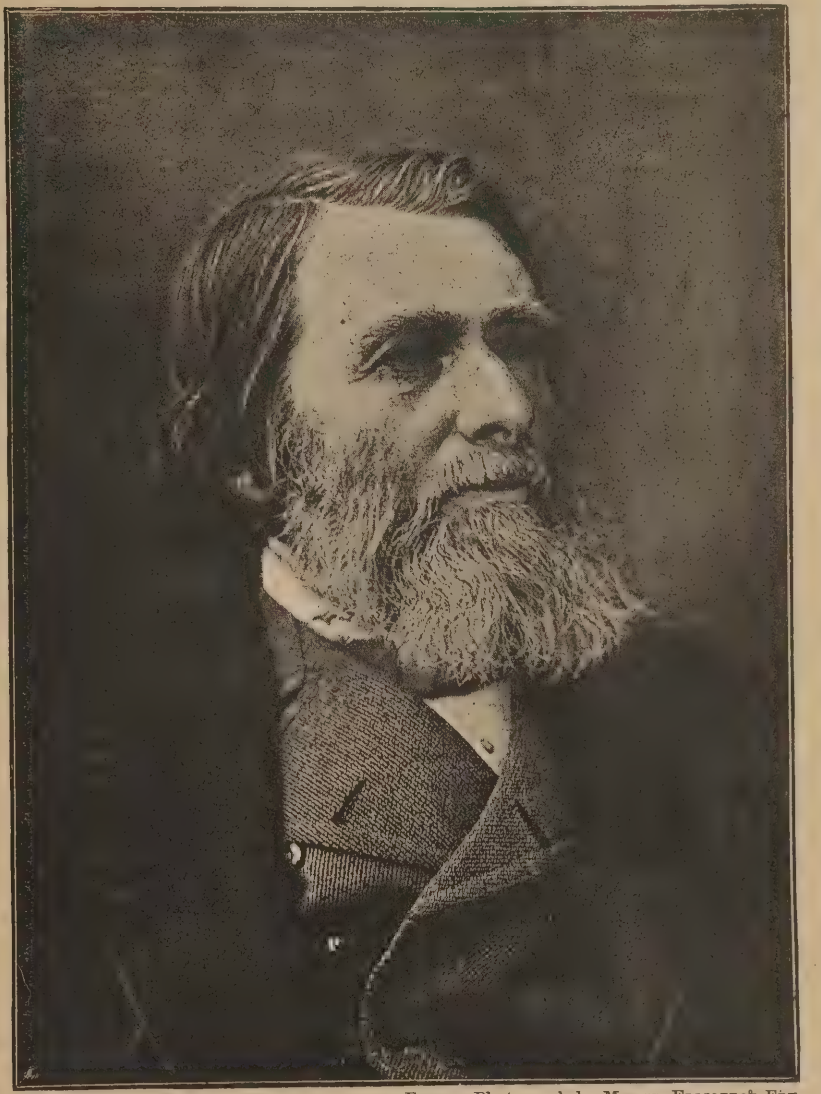
John Ruskin. THERE are few who will not feel that with the death of John Ruskin there passes from the stage of our English life one of the very few to whom the title of "great" indisputably belongs. Some will think of him primarily as the great art critic who swept aside the technicalities and pedantries by which lesser critics had been bound, and helped us to see, as he saw, the essential qualities of a work of art; to others he is supremely the reformer, the prophet of a new social order; or he is the religious and moral teacher, not the less authoritative because bound by no Church or creed; to the literary man he is first and foremost, the master of an English style of unsurpassed beauty and power. But those of us who are concerned with architecture and building think first of Ruskin as the one great leader and teacher who has devoted genius and enthusiasm to the advancement of our great art and craft. It is not necessary for an architect to accept the teachings of Ruskin in their entirety in order to recognise that whatever he has written on architecture is worthy of the closest attention, and to feel that no other voice has spoken on this subject with an authority equal to his.

The architect owes also a debt of gratitude to Ruskin for what he has done to extend a knowledge and appreciation of architecture. Many thousands of intelligent and fairly educated people, who would never have been attracted to the ordinary architectural textbook, have acquired through the fascinating pages of Ruskin's works a knowledge not of the outward form only, but of the soul and essence of noble architecture. Thanks to his eloquent pen, the works of the old cathedral builders have revealed to thousands a beauty and nobility hitherto unseen and unsuspected. The reading of such a chapter, for instance, as that on the nature of Gothic in "The Stones of Venice" has been to many as the introduction to a new world.

It is the same in regard to pictures; the ordinarily intelligent person who entirely lacks artistic skill and training, may, if he be a student of Ruskin, obtain from the contemplation of pictures an intellectual and moral stimulus and a degree of enjoyment he could never have without such help. So, too, in regard to Nature; many who have for years seen the wonders of Nature, without observing or being impressed by them, have had their eyes opened by Ruskin to the hitherto unsuspected beauties that lie in the commonest objects, and are now able to see that

> Earth's crammed with Heaven,
> And every common bush aflame with God.

It is this power of penetrative insight, combined with that other power—perhaps even more rare—of making others see what he himself sees, which is one secret of Ruskin's greatness and influence. To no man in ancient or modern times does the title of Seer more fitly belong than to him.



From a Photograph by Messrs. ELLIOTT & FRY.

THE LATE JOHN RUSKIN.

That his influence is real and abiding there can be no doubt. A leader writer in a London morning paper declared on Monday that "his influence, like his genius, was intense rather than extensive. To the great mass of his countrymen he will be a great name rather than a great inspiration." This, we think, is an utterly mistaken judgment. It may be doubted whether any Englishman in this century has exercised a wider and more commanding influence. True, the influence was often indirect, but the signs of it may be seen on every hand. There are not many men who have done good work in our time in art, in literature, in politics, in social reform, but will gladly acknowledge the inspiration they have gained from John Ruskin. Nor have there been many modern movements making for the dignifying and beautifying of life in which his has not been a potent—though sometimes unrecognised—influence. He espoused the cause of the Pre-Raphaelites when they were the objects of general obloquy; he was the inspirer of the Arts and Crafts movement and of the modern tendency towards the revival of old handicrafts and the encouragement of simple honest workmanship; he did more than any other man to humanise the science of political economy, and to inculcate those twin doctrines which lie at the root of most of the humanitarian efforts of our time—the dignity of human labour and the value of human life. But his influence does not end with his death; rather, it may be expected to increase. Wherever men love the beautiful and seek the true, the works of John Ruskin will remain a help and an inspiration alike to the humble and the great.

H. B. P.

THE "BUILDERS' JOURNAL" SHILLING FUND

TO PROVIDE HOMES FOR DISABLED AND INVALIDED SOLDIERS.

HOW EVERYONE MAY HELP.

As announced in last week's issue we have started a Shilling Fund to assist as far as possible the admirable project that has been set on foot for building a Home of Rest for discharged soldiers as a gift to the nation from the building trades. The proprietors of the BUILDERS' JOURNAL AND ARCHITECTURAL RECORD will head the list with a donation of one thousand shillings (£50).

Character of the Gift.

The purpose of the gift is to meet as far as possible the needs, which all the patriotic funds hitherto established have to a great extent overlooked, of the permanently disabled soldier discharged from the army with a pension inadequate to supply even the barest necessaries of life. It is proposed to erect and equip six cottage homes containing in all 100 beds, and in selecting inmates for the homes preference will be given to soldiers who have at some time been members of one or other of the building trades.

The homes will be erected on a freehold site at Bisley, generously given by Lord Pirbright. Their management and maintenance will be superintended by a special sub-committee of the Sailors' and Soldiers' Help Society, an excellent institution of which H.M. the Queen is patron.

Some of the Workers.

The administrative work, together with the construction of the homes, will be in the hands of a small executive, comprising Mr. Edwin O. Sachs, acting as chairman, Mr. Fred. R. Farrow, F.R.I.B.A., Mr. F. Hammond, F.R.I.B.A., and Mr. Ellis Marsland (District Surveyor), with Sir John Taylor, K.C.B. (H.M. Office of Works), Mr. Thos. Blashill, F.R.I.B.A. (late Architect of the L.C.C.), and Mr. Arthur Cates, vice-president R.I.B.A. (late Crown Surveyor), as advisers. Mr. J. Randall (President of the Institute of Builders), Mr. Thomas Gregory (President of the London Master Builders' Association), Mr. H. H. Bartlett (of Messrs. Perry and Co.), Mr. Stanley G. Bird, Mr. M. Byng (of the General Electric Company), Mr. F. J. Dove, Mr. Henry Holloway, Mr. Frank May (of Messrs. Holland and Hannen), Mr. George Haward Trollope (of Messrs. George Trollope and Sons), Mr. A. Wragg (of Messrs. Eastwood and Co.), Mr. J. Howard Colls, Mr. George Jennings, and Mr. Sam Waring are among the body of stewards representing the donors.

Methods of Helping.

The Executive of the Building Trades Gift, whose address is 1, Waterloo Place, Pall Mall, S.W., invite offers of gifts in kind; they have issued printed details, giving the exact quantities of materials, fittings, &c., required, and those of our readers who wish to help in this way should write for these particulars.

Obviously, however, there are many thousands connected with the building trades whose gifts could not possibly take that form, and in the hope of enlisting the help of many who would otherwise be left out, we have started a Shilling Fund.

By this means all who are in any way connected with the building trades—architects, architects' assistants, draughtsmen, students, builders, clerks of works, foremen, workmen and apprentices—will be afforded an opportunity of taking their share in the national gift.

Many of our readers have no doubt already contributed to one or other of the funds that have been organised for the benefit of our soldiers or their families, but we venture to hope that, if only by sending us a shilling postal order, they will take some share in this special and distinctive gift, and thus help to make it thoroughly representative of the building industries of this country.

In response to our appeal a number of contributions have already been sent in, among them one of two hundred shillings, from Mr. H. L. Florence, F.R.I.B.A. We shall publish next week the first list of subscriptions received.

The Executive and the "B.J." Fund.

The following letter addressed to the Editor and proprietors of the BUILDERS' JOURNAL shows that our action in regard to this fund is heartily appreciated by the Executive of the General Fund :—

"DEAR SIRS,

"We have just seen your letter of 16th inst. and a copy of your journal of the 17th inst., and we wish to take the immediate opportunity of this meeting to express to you our great appreciation of your generous offer to open a special Shilling Fund, which you have headed with the splendid gift of a thousand shillings.

"The effort to get in touch with the many to whom a contribution in kind or the sending of a cheque would be inappropriate is one that deserves particular attention, and we desire to thank you for having so courteously undertaken to help in this direction.

"Regarding the allocation of the monies collected by your fund, we think it might be well to postpone any decision until a few weeks hence, but it would be our wish, if it meets with your views, that the monies collected should be utilised for one distinct object in the scheme, so that the individuality of your contribution may be retained.

"Again thanking you for your courteous and generous assistance,

"We are, Dear Sirs,
"Yours very truly,
"On behalf of the Executive at their meeting,
"EDWIN O. SACHS,
"Chairman of Executive.
"THO. F. RIDER,
"Honorary Secretary."

With regard to the suggestion in the above letter about allocating to a special purpose the monies collected through our Shilling Fund we shall have something to say in a future issue; but obviously much depends upon the extent to which our readers respond to our appeal. This is an effort in which all may share.

How Architects May Help.

Let this week's BUILDERS' JOURNAL lie in your office where it is likely to be seen by chance callers. Allow the leaflet enclosed in this week's issue to be passed round amongst your assistants so that they may add their contributions to your own. Remember that this gift represents all who are concerned in any way in the work of building. The builders and builders' merchants are giving material; but a large sum of money will necessarily be required, and it is natural that we should look to the architectural profession to supply it.

How Builders and Merchants May Help.

Find out from the executive committee what building materials are required, and let them know what you can offer. Or, if you will let us know what you are prepared to give, we will communicate with the executive. But if it is more convenient to give cash, fill up the form enclosed in this number of the BUILDERS' JOURNAL and return it to us with your cheque or postal order. Circulate several copies of this week's BUILDERS' JOURNAL in your workshops, or pin up our leaflet in a conspicuous place, so that your workmen may have their attention drawn to our scheme.

How Students may Help.

Ask your fellow students whether they have subscribed to the B. J. Shilling Fund. If they have not, offer them our leaflet and a nicely sharpened lead pencil. Discuss the matter at your classes and discussion meetings. Remember that this is an effort not merely to relieve a temporary necessity, but to provide a gift of permanent value to the nation. When you have risen to the top of the architectural profession it will a satisfaction to you to remember that in your student days you had a hand in this beneficent work.

How Workmen may Help.

Talk about the Fund to your mates. Ask them if they do not think it a practical, sensible scheme. Get the form inclosed with this issue filled up and returned, and if you can fill up further slips they will be gladly sent; individual contributions need not amount to a shilling, smaller sums will not be despised. If you get twenty men to give sixpence each you will do a better stroke of work than if you sent five shillings as your personal contribution. If you are a trade unionist, mention the fund at the next meeting of your branch.

How All May Help.

Talk about the Building Trades Gift and the BUILDERS' JOURNAL Shilling Fund; do not, however, confine your efforts to talking, but pay—pay—pay! And remember the ancient motto: *Bis dat qui cito dat,* which is, being interpreted, "a shilling sent to the B.J. fund this week is better than two shillings sent a year hence."

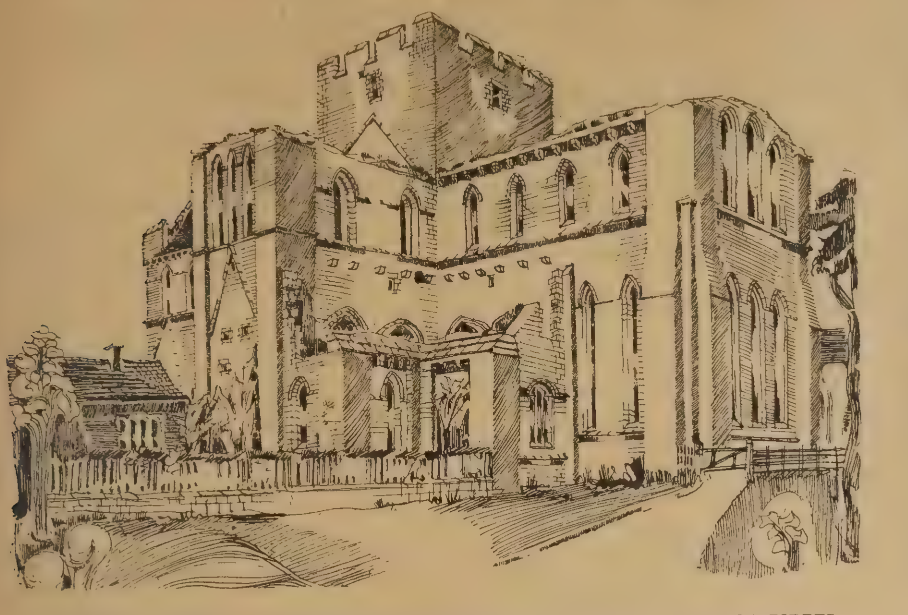
How Others are Helping.

The Executive of the Gift have received a number of valuable donations in the form of building materials. Among the more important may be mentioned the following who have contributed to the entire set of six homes, irrespective of the quantity of materials that may be required :—

Messrs. Nicholls and Clarke, the whole of the glazing; Messrs. Webbs' Engineering Company (Birmingham), the entire door fittings and window furniture, and the general ironmongery and taps; Messrs. G. A. Williams and Son, the whole of the interior blinds; Messrs. Diespeker and Co., the mosaic hall flooring. Messrs. Roberts, Adlard and Co. have offered to lay the entire slates. Messrs. Hobbs and Hart, the whole of the locks; Velongo Slate and Marble Quarries, the whole of the damp course slating and other heavy slate work; S. and E. Collier (Reading), the whole of the ridge tiles.

Numerous other gifts for individual sections of the scheme have been made, among these being :—

The Columbian Fireproofing Company, the first floor flooring of one house; Messrs. G. Aston and Sons, 50cwt. of ironwork and some large girders; Messrs. Strode and Co., the electric fittings for one house; Messrs. John Burton and Co., rafters and ceiling joists for a pair of Homes; Messrs. Lindsey, Neal and Co., the heavy girders for a pair of Homes.



LANERCOST PRIORY: VIEW FROM THE SOUTH EAST. SKETCHED BY EDWIN FORBES.

A RUN ROUND CARLISLE.

By EDWIN FORBES.

A WANDERING architect like Autolycus must be a gatherer of smaller things than cathedrals, and in a trip round Carlisle he will bring back a fund of ideas for every-day work. One could hardly come across a more interesting part of the country where the average of old work is so good.

Wetherall, an ideal village some five miles from Carlisle, is very complete with its village green and cross, while its cottages are thatched and, for the most part, pleasingly covered by greenery. The village church has a splendid south elevation, the other parts having been spoilt by restoration. This church is at the side of the Eden, the banks of which are well wooded, while the surrounding scenery is of the most charming description.

A little to the south of the village are the remains of the priory. The tower stands alone with bold embattled cope and square-headed deeply-recessed windows of the fifteenth century. The village of Corby lies across the Eden and may be reached by a ferry or "toll bridge," the view from which is very fine.

This village, with its lovely setting and its old-world air, has a castle which was restored in the last century; it is quite Adams in character. The caves of St. Constantine in the castle grounds on the banks of the river are cut out of red sandstone and are very primitive.

The snug village of Brampton also lies within range of Carlisle. It presents the appearance of a quiet agricultural town, little likely to change its ancient character to meet the claims of modern business, that are elsewhere conceded. Near the market hall are the old "stocks;" some good sketches may be made round about the market cross.

About two miles east of Brampton, by the banks of the Irthing, stands the Priory of St. Mary, Lanercost. Little is known of the early history of this venerable pile, beyond that it was founded by Robert de Vaux, Lord of Gilsland, about 1166, and became the home of a colony of Augustine monks from Hexham. The west front of the church is exceedingly fine, and of the purest and simplest Early English. Above the doorway is an arcade, with cleverly carved caps, over which are three long lancet windows. The nave of the church has been restored with great taste and is used as a parish church; the choir, transepts and tower are roofless.

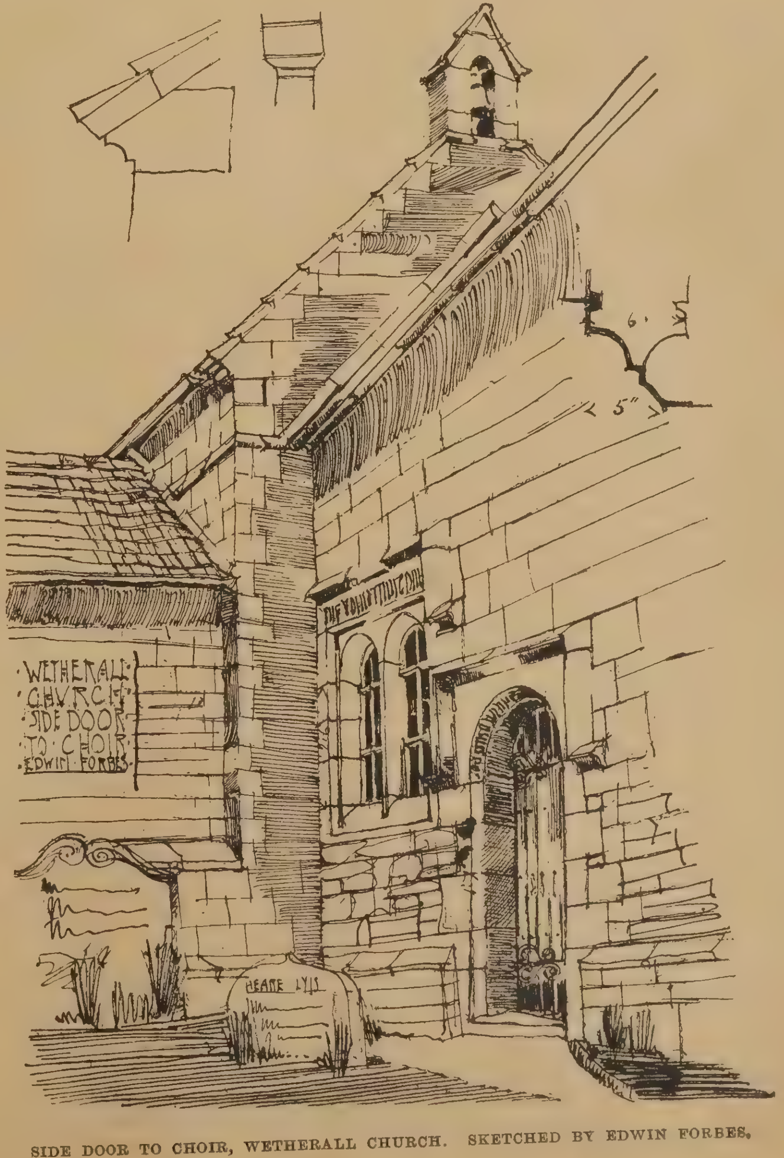
The magnificent tomb of Thomas, Lord Dacre, exquisite in design and covered with the arms of the various baronies, is a study for lovers of heraldry.

The monastic buildings are very complete with the exception of the chapter house and dormitory, which have been demolished. The banqueting hall has five-light mullioned windows, an open fireplace and an original timber roof; and the abbot's house, although roofless, is otherwise very complete. The vicarage is one of the most pleasing "bits" to be met with, so perfect is it in proportion; it is a good example of English Renaissance. Abutting it is an old tower, containing the room in which Edward the First slept during his visit to Lanercost.

Across the Irthing, on a hill, stands Naworth Castle. The quadrangle is especially interesting with its long mullioned windows and its open staircase. The great hall occupies the north side and is approached by a broad open staircase. By the dismantling and destruction of Kirk Oswald, Lord William Howard acquired for his own castle the oak ceiling and wainscot work of that ancient hall and chapel, which he used at Naworth.

On the way from Naworth to Gilsland lies the famous Roman camp. The road is on the top of the old wall for several miles, and the camp is of great interest to the antiquarian and the architect. Equi-distant from Carlisle and Penrith is Armathwaite Castle. It presents no appearance of a fortified residence, but is pleasantly situated in beautifully wooded grounds. Architecturally speaking, it is only for the sketch book.

Three miles further on is a nunnery, a house of the Benedictine nuns, but this unfortunately has been almost entirely demolished. The grounds, however, are still as in the "days of yore." The old pigeon house, the stone summer houses, covered with cinquefoils and heraldic devices, are all most interesting. Near the remains of the nunnery is a Roman altar and an old cross, said to mark the boundary of the ground to which malefactors could flee, and upon which is inscribed


6"
5"
WETHERALL CHURCH SIDE DOOR TO CHOIR
EDWIN FORBES
HEARE LYIS

SIDE DOOR TO CHOIR, WETHERALL CHURCH. SKETCHED BY EDWIN FORBES.

LANERCOST VICARAGE. SKETCHED BY EDWIN FORBES.

"Sanctuarum 1088." A few miles through very hilly country brings one to Kirk Oswald, a long, straggling, crooked street lying on a steep hill. Almost every second house is old-fashioned, and each has a quaint old sign-board; in most of these houses there is some very good panelling. At this point we join the main road to Carlisle, feeling that this run round its precincts has not been time wasted.

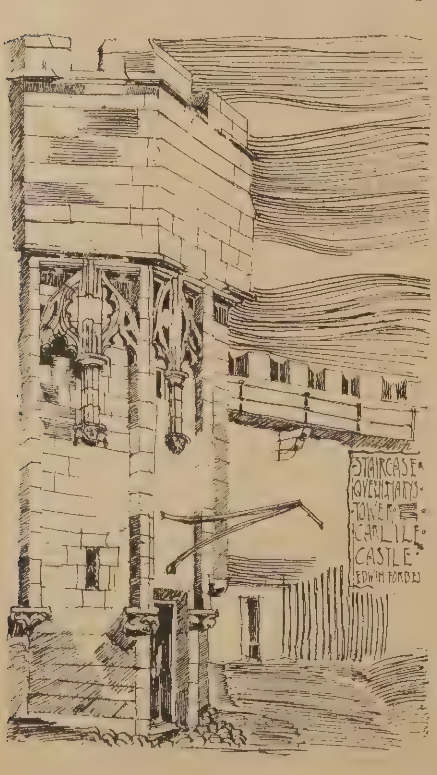
MODEL ANSWERS TO EXAMINATION QUESTIONS.

Being Answers to Questions set at the Final Examination held by the Royal Institute of British Architects in June, 1899.

By G. A. T. MIDDLETON and R. W. CARDEN, Associates R.I.B.A.

X.—SPECIFICATIONS AND ESTIMATING.

1. *Write a specification of the carpenter's and smith's work to a staging 50ft. long and 20ft. broad, with an average height of 10ft., at the side of a road to view a public procession.* (There would, of course, be ample drawings to a large scale supplied in actual work, but here no drawings are asked for, and none therefore given.)



STAIRCASE, QUEEN MARY'S TOWER, CARLISLE CASTLE. SKETCHED BY EDWIN FORBES.

The timber used throughout the staging to be best, well-seasoned Baltic fir, die square, and free from shakes, large knots, and all other defects. (It is assumed that the ground upon which the staging is erected is paved in some manner, or is sufficiently compact to render any boarding or other foundation for the bearers unnecessary.)

The sill beams are to be 10in. by 10in. and 50ft. long, placed 10ft. (centre to centre) apart and connected at four points in their length by 6in. by 4in. cross pieces bolted down to the sills. The verticals are to be 8in. by 8in. and of the heights shown on the drawings, secured to the sill with dog-irons, and strutted apart at their feet with 4in. by 6in. straining pieces. The heads (this could only be expressed by a drawing) are to be 8in. by 8in. resting on cleats, and supported at two points in each span by raking struts and straining pieces of 5in. by 5in. stuff secured together with dog-irons as shown. The verticals at the back, front, and sides of the staging are to rise 3ft. above the level of the part of the flooring adjacent, so as to form a balustrade, and all verticals are to be braced with a 5in. by 8in. diagonal, secured with dog-irons between each two verticals throughout the structure. The carriages to be 6in. by 8in., with rough spandrels out of 2in. stuff to carry the boarding. The railing round the stand is to consist of two 6in. by 5in. rails, tenoned into the uprights, one at the top of the posts and the other at half its height from the floor. The stairways at the sides and centre of the stand are to have one intermediate step, with 1½in. treads and riser, glued and blocked, and secured to floor between each two tiers of seats. Upon completion, the work is to be tested as thoroughly as possible in the presence of the architect, when special attention will be paid to the strength and size of the exits, stairways, &c., in case of a panic.

2. *Write a specification of the excavator's, bricklayer's, and tiler's work for a swimming bath, below the dressing-room floor level, 80ft. long and 30ft. wide.*

EXCAVATOR.—Remove vegetable soil to level of bottom of layer of hard brick rubbish, and wheel and deposit it.

Remove superfluous surface soil, and re-use for filling where required to make up finished levels. Excavate trenches for outer walls of dressing-rooms to the depths shown (on drawings which in actual work would be supplied), 3ft. wide, the bottom to be rammed and levelled. The depths shown on the drawings are believed to be sufficient, but should a firm bottom not be reached the contractor is to call the architect's attention to the fact before proceeding. The trenches are to be filled in as soon as walls are above ground level. Excavate for the tank of the bath to the bottom of the level indicated on the section for the layer of dry brick rubbish, and (but this may not be necessary, depending upon situation, whether in wet soil, &c.) provide and maintain shoring, sheeting, planking, and strutting, also pumping and baling, as required, and remove plant when no longer necessary. The bottom is to be thoroughly well punned and consolidated. All filling-in is to be well punned in layers and watered when so directed. All superfluous earth is to be removed and carted off the site.

Brick rubbish.—Lay over the bottom of the tank a layer of broken brick rubbish 12in. thick, well rammed and consolidated, and under the floors of the dressing rooms, as shown on section, a similar layer, but 6in. thick.

Concrete.—The concrete for foundations and the bottom of the tank to consist of fresh burnt blue lias lime and ballast of clean, sharp pit or river gravel, to pass a 2in. mesh, and clean sharp sand, mixed on a boarded platform in the proportion of one of lime to five parts ballast and two parts sand, the whole to be thoroughly incorporated and sprinkled with sufficient water, its consistency to be such that it will support the weight of a man at the time it is shovelled into position. The concrete bottom of tank is to be 2ft. thick.

Asphalt. — Lay over the whole width, from the outer side of the external walls to the kerb of the bath tank, a ½in. layer of Val de Travers asphalt, to be laid by the company's own workmen and finished where exposed with a smooth surface. Lay a similar layer over the bottom of the bath tank and also a vertical layer upon the inner faces of the brick walls, to be hereinafter described, composing the sides of the tank. The asphalt to the sides and bottom of tank to be prepared for tiles.

BRICKLAYER. — *Bricks.* — The bricks for footings in the external walls of the dressing rooms to be approved hard, sound, well-burnt whole stocks, bats to be used only where necessary for bond. The bricks used in the walls of the tank are to be blue Staffordshires, of best quality, true in shape, well burnt and giving a metallic ring when two are knocked together.

LANERCOST PRIORY: THE VICARAOE. SKETCHED BY EDWIN FORBES.

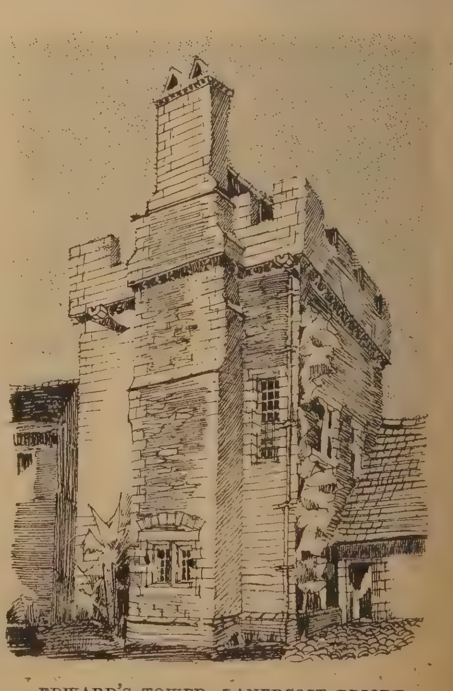
Lime.—The lime to be fresh burnt blue lias lime of approved quality.

Sand.—The sand is to be clean, sharp river sand (if in London, from above bridge) of medium coarseness and approved quality.

Cement.—The cement to be Portland cement from an approved maker, to weigh not less than 112lbs. per striked bushel and ground sufficiently fine to pass 90 per cent. through a sieve of 2,500 meshes per square inch.

Mortar.—The lime mortar to be composed of one part of lime to two parts of sand, well mixed by hand in quantities sufficient only for one day's consumption. The cement mortar to be mixed in quantities as required for each day in the proportion of one part of Portland cement to two parts sand.

Brickwork.—The walls of the tank are to be built exactly to detailed drawings to be



EDWARD'S TOWER, LANERCOST PRIORY. SKETCHED BY EDWIN FORBES.

supplied. To be of blue Staffordshire bricks in English bond set in cement, 3ft. thick at base at the deep end and diminishing by external offsets of 2¼in. every five courses to 1ft. 6in. at the top. The wall at the shallow end to be 18in. thick at top and stepped internally with eight brick steps of 1ft. 2in. treads and 6in. risers, the nosings to be quarter-round moulded bricks. The side walls are to be of the same depth and thicknesses for the length of 16ft. adjacent to the deep end as the deep end wall. The length of 16ft. adjacent to the shallow end wall is to be similar to the corresponding upper part of the deep end wall, and the space between the two parts specified is to vary in depth per each length of 16ft. approximately with the sloping surface of the tank floor (all this again renders drawing absolutely indispensable). Lay rows of tarred and sanded hoop-iron bond, No. 15 gauge, 1½in. wide, at about every four courses throughout the height of the walling, well connected at the angles. The asphalt paving in front of the dressing boxes is to stop against the top course of the tank walls. This top course is to be brick on edge with a quarter-round moulded brick to the nosing.

TILER.—The floor of the tank is to be paved with 9in. buff-coloured tiles of approved make. The walls of the two sides and end to be tiled with 6in. white glazed tiles of approved manufacture.

3. *Write the specification of the ironfounder's, carpenter's, and glazier's work, for a covered bridge above the ground-floor storey* (sic.), *between two buildings at the distance of 20ft. apart.*

IRONFOUNDER.—*Joists, &c.*—Provide and fix two steel joists 15¾in. by 6⅛in. and weighing not less than 62lbs. per foot run, and having 12in. bearing at each end upon hard York stone templets 18in. by 12in. by 6in. deep. The uprights shown upon the detail drawings to be of the following sections:—angle irons 3in. by 3in. and T-irons 3in. by 4in., secured by angle cleats and rivets to the upper flange of the rolled steel joists. The top-rail T-iron to be 5in. by 3in., secured by angle cleats, as before described, to the uprights and securely built into the wall at both ends. The 4in. by 3in. rolled steel joists in the floor to be placed 4ft. apart (the intervening spaces to be filled with coke breeze concrete 4in. thick and described under excavator) and to rest upon and be rivetted to a 3in. by 3in. angle iron, rivetted to the web of the rolled steel bearing joists.

Rainwater Gutter.—Provide and fix a 3in. ogee cast-iron rainwater gutter with 3in. cast-iron downpipe where shown on the section, the gutter to be firmly screwed to the fascia board. All ironwork to be properly painted with red lead paint before being fixed.

CARPENTER.—The joists of the flat roof are to be of the best Baltic fir, die square, free from sapwood, shakes, and all other defects, to be 6in. by 2in. at the highest point, and to fall 1in. towards the gutter. They are to be 14in. centre to centre, and to be properly secured to the T-iron top-rail. The boarding to this flat to be 1in. rough boarding.

GLAZIER.—The fixed lights and the fan lights above them to be glazed with coloured rolled cathedral glass with narrow cames, and to be bedded into the frames with white lead.

4. *Write the specification of the mason's work of a stone portico for carriages to a mansion or public building.*

Generally.—The whole of the stone to be Portland stone from the Whitbed stratum, free from sand holes, vents, and all other defects; to be worked so as to be on its natural bed in the actual work, and to be put together with fine joints in putty, and cleaned down and left perfect at completion. All stone injured by frost, negligence, or any other cause is to be taken out and replaced. All stones to hold their full scantlings, and to be cut die square on all sides, except in the case of mouldings or where otherwise directed. All sizes of stones shown on the detail drawings are to be followed exactly, and the stonework is to be put together with slate dowels 1in. by 1in. by 3in. long fitted to square cut mortises and run with cement. The cramps to cornices and copings to be of bronze and run with Spence's metal.

Mouldings.—The plinths, arch-moulds, cornices, and all other mouldings are to be carefully worked in accordance with the details supplied, and all mitres are to be truly struck.

Carving.—Provide a p.c. sum of £........, to include the carving of all the caps to columns throughout the portico. Provide a p.c. sum of £........, to include the carving of all the caps to pilasters throughout the portico. Provide a p.c. sum of £........, to include the carving on all keystones where carving is shown. Provide a p.c. sum of £........, to include the turning of all balusters in the parapet wall.

Vaulting.—The vaulting of the portico is to consist of interpenetrating semi-circular barrels in three bays, as shown on the plan of vaulting, with each stone carefully and accurately worked to detail, with semi-circular joggles as shown, and bronze cramps on the extrados.

5. *Give the current prices for the items in the excavator's and bricklayer's work in the basement storey* (sic.) *of a warehouse, the ground floor being 12ft. above road level, and basement storey* (sic.) *10ft. high in the clear.*

This is an unfortunately worded question, for, by the London Building Act, 1894, Part I., section 5, sub-section 11, the apartment designated by the term "basement" should really be called the ground storey. The sub-section is as follows:—

"The expression 'ground storey' means that storey of a building to which there is an entrance from the outside on or near the level of the ground, and where there are two such storeys then the lower of the two." Now, obviously both floors in the question would be entered from ground level, the floor of the so-called basement being about 12in. above that line, while the entrance to the ground storey in the question is 12ft. above ground level, which could scarcely be held to come under the L.B.A. definition of "on or near the level of the ground."

EXCAVATOR.—(The general descriptions would be obtained from the specification).

		£	s.	d.
Yd. cube.	Excavate in manholes and surface trenches and cart away superfluous earth	0	3	6
Yd. cube.	Return, fill and ram earth to trenches after foundations are laid...	0	1	6
Yd. super.	Excavate surface soil 12in. deep, wheel away and deposit where directed	0	1	3
Yd. super.	Fill in with dry brick rubbish 12in. thick and well ram ...	0	1	8
Yd. cube.	Lime concrete in foundations ...	0	11	0
Yd. super.	6in. Portland cement concrete in manhole bases	0	2	6
Yd. super.	6in. Portland cement concrete laid over site and roughly floated to a smooth surface ...	0	3	0

BRICKLAYER.—(General descriptions from specification.)

		£	s.	d.
Rod.	Reduced 14in. brickwork in manholes, footings, walls, &c. ...	16	3	0
Rod.	Reduced 14in. brickwork in 4½in. walls in mortar...	17	0	0
Ft. run.	*Extra only* to brickwork for forming relieving arches in 14in. brickwork...	0	0	9
Ft. run.	4½in. brick trimmer arch in cement	0	0	6
Ft. run.	Rough cutting to skewbacks ...	0	0	2
Each.	Bed and point frames, from 1s. to 2s. according to size.			
Each.	Air bricks, including setting ...	0	0	9
Ft. super.	Callender's bituminous damp-proof course	0	0	3
Yd. super.	Extra only to brickwork for facing (if any)	0	0	9

6. *State what are the principal items in a joiner's bill of quantities, and give the prices.*

JOINER.—(General description as in previous question.)

		£	s.	d.
Per square.	1¼in. yellow deal flooring in batten widths, laid folding and with splayed heading joints	1	12	0
Ft. run.	Border to hearth, &c.	0	0	4
Ft. super.	1¾in. wrought and bead flush one side and moulded other side 4-panel doors	0	1	4
Ft super.	2in. wrought and moulded both sides 6-panel front door, outside bolection moulded ...	0	1	5
Ft. super.	1¾in. moulded both sides 6-panel doors		1	2
Ft. run.	4½in. by 3in. rebated and moulded door frames	0	0	6½
Ft. run.	4½in. by 3in. rebated and moulded solid window frames	0	0	6½
Ft. super.	1¾in. rebated and moulded casement sashes	0	0	9
Ft. run.	Proper deal cased sash frames..	0	1	6
Ft. super.	2in. double hung ovolo moulded sashes	0	0	10
Ft. run.	6in. by 1¼in. rounded window board grooved for plaster ...	0	0	4½
Ft. run.	4½ by 1¼in. twice rebated door linings	0	0	4
Ft. run.	4½in. by 1in. soffit lining... ...	0	0	3
Ft. run.	3½in. by 1½in. double-faced architrave to detail on ¾in. grounds	0	0	5
Ft. run.	3in. by 1¼in. splayed architrave on ¾in. grounds...	0	0	5
Each.	Mitres to ditto	0	0	3
Ft. run.	9in. by 1in. torus moulded skirting	0	0	4½
Ft. run.	6in. by 3in. oak sunk, weathered and check-throated sills, with grooves and metal tongues bedded in white lead	0	1	3
Ft. run.	11in. by 1½in. moulded close outer string to stairs	0	1	0
Each.	Extra only ramps to same ...	0	2	0
Ft. run.	1¼in. moulded wall string ...	0	0	11
Ft. super.	1¼in. grooved treads with rounded nosings	0	1	4
Ft. super.	1in. tongued risers	0	0	6
Each.	Housings of risers and nosings into wall and outer strings ...	0	0	6
Each.	Housings of treads into ditto ...	0	0	4
Each.	1¾in. turned balusters 3ft. long	0	1	4
Ft. run.	3½in. by 2½in. moulded oak hand-rail to detail	0	2	6

Enclosures to closets, match-boarding, shelves, dressers, plate-racks, &c., &c.—these are all of lesser importance.

7. *State what questions under an ordinary building contract are to be settled by the architect, and what by the umpire.*

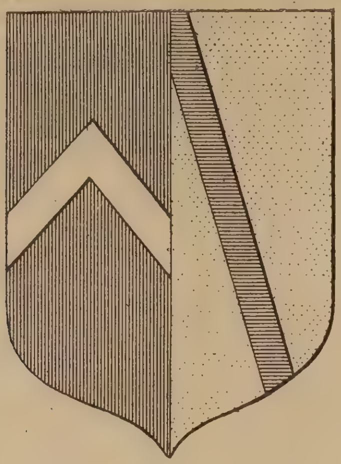
The architect will decide (*a*) whether the work is being carried out in accordance with the true intent of the drawings and specification; (*b*) in the case of discrepancies between the drawings and specification, he will decide which is to be followed; (*c*) and in the case of errors in setting out he will decide whether the contractor is to bear the cost.

The umpire will decide all other cases that may arise in which the contractor and the employer, or the architect on the employer's behalf, fail to agree.

"Scottish Architectural Details," by John W. Small, F.S.A. (Scot.), architect, Stirling, of which a limited edition was published twenty years ago, is to be re-issued by Mr. Eneas Mackay, bookseller, of Stirling. This will practically be a reproduction of Mr. Small's "Leaves from my Sketch-Books," with the plates relative to Market Crosses replaced by others of equal interest, as the former have been incorporated in "Scottish Market Crosses," recently published. The new edition will be limited to 500 copies, issued to subscribers at 30s. per copy net.

A Much-needed Improvement.—It is about time that that ugly block of houses at the junction of Tottenham Court Road with Oxford Street were pulled down. On the western side the block forms a narrow passage known as Bozier's Court, and it is about 190ft. long by about 20ft. wide. Although the dimensions of it are not great, many flourishing businesses have for years been carried on in the houses, and their removal will cost the London County Council £53,860. The work of demolition, which has only just commenced, will give to Tottenham Court Road at this point a width of 110ft.

A New Wing at Warneford Hospital, Leamington, has been built at a cost of about £7,000. Connected with the existing hospital by a corridor, the new wing is about 166ft. long and 92ft. wide, and will provide accommodation for about thirty-three patients. It is to be known as the "Victoria" wing. It comprises two wards, each accommodating fourteen beds, and four single wards, as well as bath rooms, lavatories, linen and clothes rooms, kitchens, and other offices. The sanitary blocks of the building are paved with mosaic, and the floors are of patent fireproof construction. The exterior is of red brick, with stone dressings. The work has been carried out by Messrs. G. F. Smith and Sons, of Leamington.



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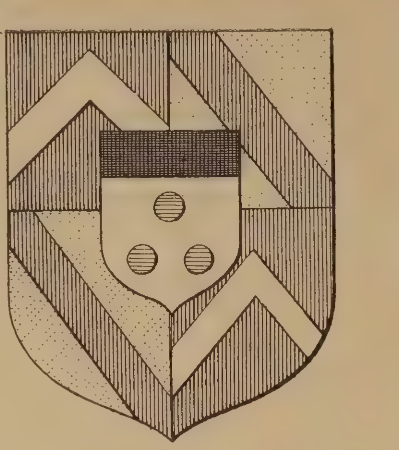
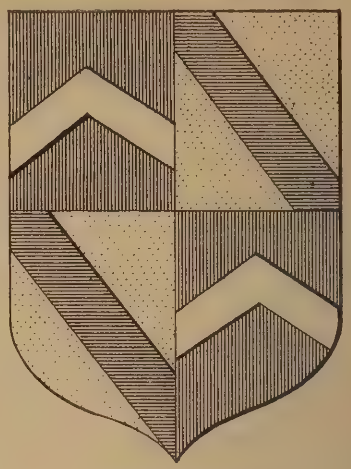


QUARTERED ARMS, WITH SHIELD OF PRETENCE.



QUARTERED ARMS.

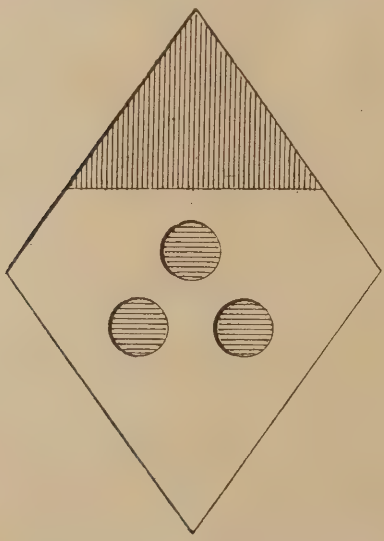
HERALDRY.—II.

By GUY CADOGAN ROTHERY.

(*Continued from page* 351, *No. CCLVII.*)

BLAZONRY AND MARSHALLING OF ARMS.

BLAZONRY is the art of describing in proper terms armorial bearings, badges and other heraldic insignia, so that anybody versed in the somewhat complicated phraseology and stringent rules would be enabled, after reading the description, to make a drawing of the arms. The word blazon is of German origin; it means "to blow," and is derived from the custom of heralds at tournaments, or before two adversaries met to engage in a trial by battle, to first blow a horn and then explain the titles and armorial bearings of those about to enter the lists; thus blazon literally means "to make known."



LOZENGE SHIELD (CONTAINING LADY'S ARMS).

The first rule of blazonry is that when describing a shield, the tincture, that is, colours or metals, should first be mentioned, with the divisions, if any, and their forms. Then the ordinaries and sub-ordinaries are mentioned, and if any of the ordinaries are charged with some heraldic symbols they should be blazoned immediately after the ordinaries, after which the common charges are mentioned; for instance, the arms of Lord Aberdare are thus blazoned: Or, a saltire and a chief gule, the last charged with a martlet of the first. But, in obedience to the third rule, if the above armorial bearings had had a common charge in the base, the description would stand thus: Or, a saltire gule between four crescents azure, on a chief of the second a martlet of the first. Again (rule four), if instead of the saltire there were a star, all common charges, one must not say "four crescents and a star in the middle," but "a star between four crescents," for the charge nearest the middle of the shield must always be mentioned first. Rule five is most strict, and is framed to avoid tautology. The example for the second rule will also do as an example for rule five; it will be noticed that we say, "Or, a saltire and a chief gule, the last charged with a martlet of the first," thus avoiding the repetition of the words or, chief, and gule. The sixth and one of the most stringent rules in English heraldry is, that metal should not be on metal, nor colour on colour. For instance, supposing the field of a shield to be azure, any charge placed on it must be of either one of the two metals, or, to reverse the case, if the shield be argent, the charges must be of one or other of the heraldic tinctures, or furs. This rule, however, does not apply to marks of cadency, or to crowns, chains, or to the claws, tongue, and manes of animals, which are often emblazoned of a different tincture to the animals themselves, in which case metal may be on metal, or colour on colour. Another very stringent rule in English heraldry forbids the use of words formed by letters of the alphabet, or any inscription, being displayed on a shield. The arms of the University of Oxford are, however, a striking exception to the rule. But the English heralds of the seventeenth and eighteenth centuries continually ignored this rule in granting augmentations, or in making fresh grants of arms.

Having blazoned, or described, the field and its charges, the mark of cadency and the badges worn by baronets are next mentioned. And lastly, the outside ornaments, emblazoned in the following order: supporters, coronets, crests, badges, mottoes, and collars or badges of knighthood. It is not necessary to blazon either the helmet or mantling.

Marshalling is the art of emblazoning more than one coat-of-arms on one shield, according to the proper rules of blazonry.

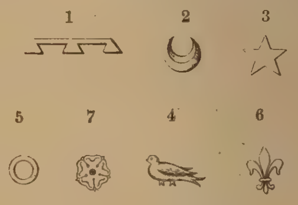
There are five grades of marshalling; they are:—The wearing of a shield of pretence over all, or the quartering of the insignia of their various states by kings, in which case they give precedence to the most ancient or the most important state. An elector may wear his hereditary arms in a shield of pretence over the insignia of his electoral dominions. Oliver Cromwell, notwithstanding that this rule would hardly be applicable in his case, added his paternal arms, in an escutcheon of pretence, to the armorial bearings of the Commonwealth.

Bishops, kings of-arms, heads of colleges, colonial governors, and other dignitaries impale, that is to say, place side by side on the same shield, the arms of their sees or offices with their paternal arms. In these cases the official arms always take precedence, being placed on the dexter side of the paternal arms, which occupy the sinister side of the shield.

A man who marries an heiress (a woman who represents the last of her family) bears her arms in an escutcheon of pretence over his own; his descendants afterwards quartering their maternal and paternal coats.

And, finally, a husband may impale, or as it is generally termed, bear his wife's arms *accollée* to his own, the man's arms being on the dexter side, and the wife's on the sinister. In early times when a husband wore his wife's arms *accollée*, only half of each shield was borne, but this practice soon died out; the only vestige of it as yet remaining is that when one of the shields is emblazoned with a *border* or an *orle*, that portion nearest the second coat of arms is left out.

As has already been shown, the heralds, in order to record the acquisition of new dominions by kings, and to record family alliances, instituted the practice of quartering, when the escutcheon of the newly acquired dominion, or of the heiress, is exhibited on the same shield as that occupied by the paternal arms, and which is, for that purpose, divided by horizontal and perpendicular lines. When the bearer is entitled to only one quartering, the first and fourth quarters exhibit the paternal coat, the second and third the arms of the heiress. Any number of quarterings may be borne on a shield, and if they are of an uneven number, the paternal arms are repeated in the last quarter.



MARKS OF CADENCY.

1. The Label. 2. The Crescent. 3. The Mullet.
4. The Martlet. 5. The Annulet. 6. The Fleur-de-lis.
7. The Rose.

If the coat of an heiress be already quartered, it is known as a *grand quarter.*

The earliest instance of quartering of arms, in England, is that of Castile and Leon shown on the tomb of Eleanor, Queen of Edward I.

In continental heraldry it is a common thing to see shields overcrowded with quarterings, even as many as forty, a practice especially prevalent in Germany, but in English heraldry only the most important alliances are recorded on the paternal shield.

Marks of Cadency are badges worn on the shield, near the top, to denote descent. The label belongs to the eldest son, the crescent to the second, the mullet to the third, the martlet to the fourth, the annulet to the fifth, the fleur-de-lis to the sixth, and the rose to the seventh. Strictly speaking, the eldest son of a second son ought to wear a crescent differenced by a label, and so on.

(*To be continued.*)

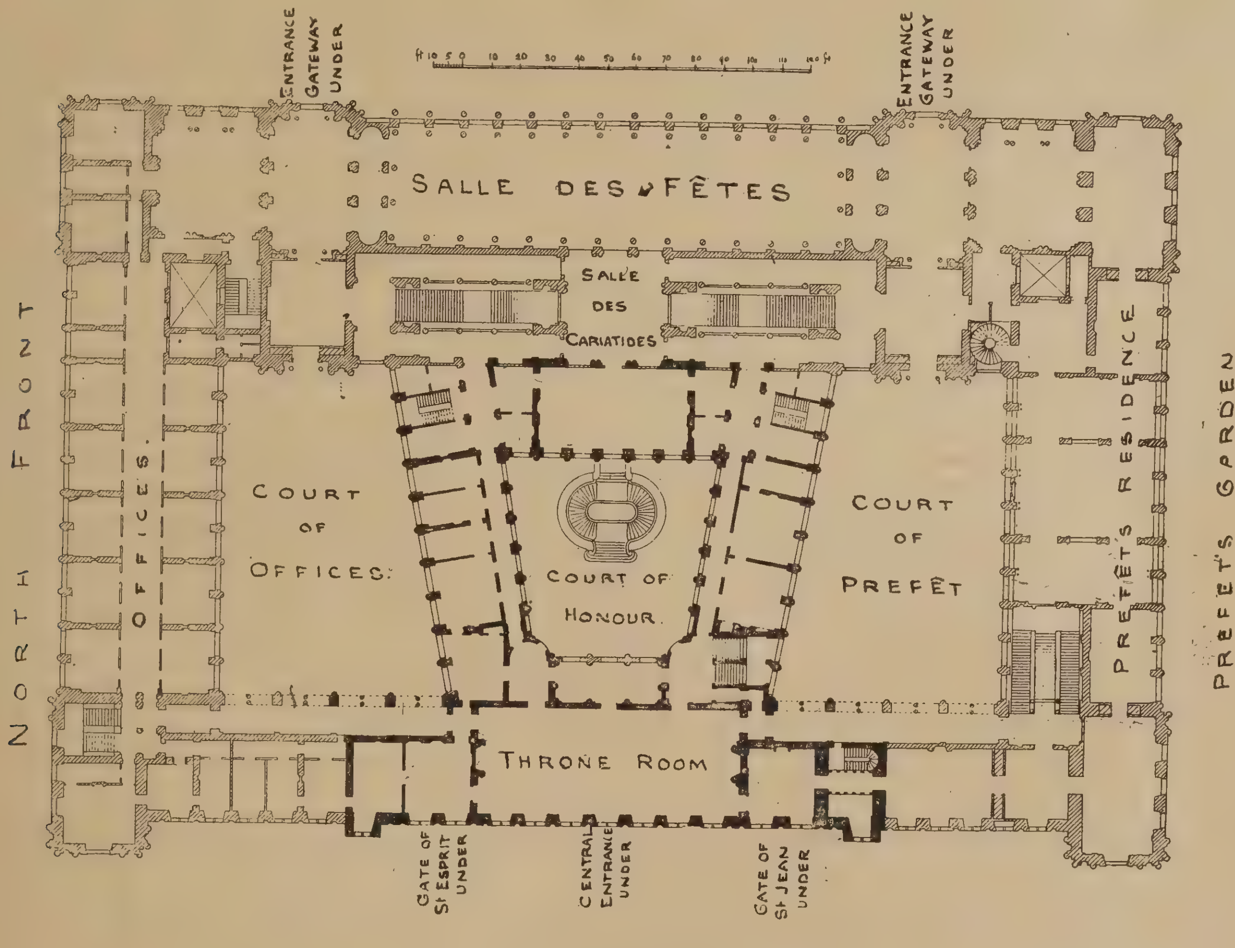
OLD HÔTEL-DE-VILLE, PARIS.

By R. PHENÉ SPIERS.

THE Hôtel-de-Ville was not completed—as shown in the general view on one of our inset sheets—till 1847. The more ancient portion was commenced in 1533, but so slow was the progress made that more than a century elapsed before the original design (shown on the plan on this page and blacked-in) was carried out. The triangular shape of this central block was necessitated by the existence of earlier structures which it was deemed necessary to preserve—namely, the Chapel of the Holy Ghost on the north side and a street called the Rue de Martroi on the south side, which led to a church of St. John in the rear. Those buildings were removed in 1835, and the court of the offices on the north, the court of the "Préfet" on the south, and the grand staircase and Salle-des-Fêtes on the east side were built from the designs of Le Sueur, not being completed till 1847. The only subsequent additions were those made in 1855, when the central court was roofed over with glass and the horseshoe staircase, shown on the plan, was erected. These alterations were made in anticipation of a visit paid by Her Majesty Queen Victoria, who, with the Prince Consort, was received there by the Emperor and Empress in August of the same year.

The destruction of the building by the fire in 1871 was so disastrous that it was decided to reconstruct the whole building on the same lines, so far as the designs of the sixteenth and nineteenth centuries suggested, but with many modifications in the plan and with an increased area. The west front of the original structure was brought forward into the Place de l'Hôtel-de-Ville some 30ft., and the central court was made rectangular, with circular turret staircases in the angles, the picturesque result being far inferior to the original. The fragments of the old front were stored in the garden on the south side and carefully measured, casts being taken of all the sculpture so that, as far as possible, the first design should be adhered to. The two doorways on either side of the central block, originally the porch leading to the Chapel of the Holy Ghost and the archway leading to the Rue de Martroi, were retained as features, and in other respects the main front is reproduced as it existed before the fire. The level of the central court (Cour d'Honneur) was between 12ft. to 14ft. above that of the Place de l'Hôtel-de-Ville, and its pavement was carried on a series of vaults. In order to insure the complete destruction of the building, dynamite had been placed in these by the Communards, and all the vaults were blown up. The view of the Cour d'Honneur (see inset sheet) is therefore taken from a lower level than that originally exposed. The court of the offices is seen in the distance on the left. The arches in the centre of the drawing are those of the arcade on the level of the central court; the horseshoe staircase stood above where the carts are shown. The archways above on the right are those which opened into the hall known as the "Salle-des-Caryatides," the vestibule leading to the Salle-des-Fêtes. The interior of this hall is shown on the inset plate, and the iron rods hanging down are the skeletons of the caryatid figures which formed the chief decoration of the gallery above, all round the hall. This gallery was corbelled out on a coved vault and was a favourite position from which to view the receptions in the hall and the dancing in the Salle-des-Fêtes.

The various relics illustrated are those which decorated the fountain in the centre of and underneath the horseshoe staircase. They had fallen down into the vaults and were probably set up to be photographed before my visit. The only change I made was to turn round the bust of the Empress Eugenie (on the right), as it was too much disfigured.



PLAN OF THE OLD HÔTEL-DE-VILLE, PARIS.

Architectural Photography.

IN a paper on this subject recently read before the Royal Photographic Society, Mr. Henry W. Bennett said that architectural photographs might be broadly divided into two classes, those that aim at giving a pictorial representation of some fine or characteristic piece of architectural work, and those that are simply accurate and faithful reproductions, fulfilling the functions of working or detail drawings, where no attention is given to pictorial effect so long as accuracy and clearness are secured.

Insufficient foreground is a weak point in many architectural photographs. In the desire to show more of the roof and cut off some of the large expanse of floor that is almost always seen on the focussing screen before the rising front is brought into use, there is frequently a danger of cutting off far too much, and considerably detracting from the value of the principal points of the picture. There should, in most cases, be sufficient floor in front of the nearest vertical object to suggest the space that really exists between it and the observer; this sense of space is never conveyed if the floor is cut off immediately in front of any important object.

Distance is a factor that is sometimes overlooked, but it is quite as important as in landscape work. Nothing is worse than to see the whole of a subject on one plane, as is frequently the case when a doorway or similar subject is photographed. There should always be some work, or at least the suggestion of work, beyond the principal point of interest. An open door, suggesting something more distant, will frequently be sufficient when nothing else is available.

It is desirable, when photographing doorways, that an angular rather than a perfectly square view should be taken. When the camera is set exactly in front the result is far too geometrical to be pleasing, and the sense of relief is largely lost, while, with a more angular view, the effectiveness of the picture is not only greater, but the projection or relief of the various parts is better represented, and the character of the whole work more satisfactorily conveyed. In connection with the consideration of perspective, foreground, and distance, the value of lines running into the picture is very great. One or two only will frequently convert a flat meaningless mass into a receding plane.

Any approach to a symmetrical view should always be avoided. In the choir or aisle of a cathedral, for example, the camera should be placed out of the centre, so as to show more of one side than of the other, the perspective lines converging to a point away from the centre, and the side more fully shown should contain the chief point of interest.

There is another quality that does not always receive the attention that it deserves, that of completeness. No architectural photograph can be considered satisfactory if it conveys instinctively the impression of something being wanting to complete the subject, as an arch or a column almost perfect but broken off just incomplete. This is a defect that so frequently occurs in the productions of those that can fairly be called leading workers that it is necessary to emphasise it as a fault very strongly.

The most suitable weather for interior work is when there are plenty of light clouds, especially if they are low down; the light is so diffused that dark corners are better illuminated, and the lighting of the whole building is soft and harmonious. A grey or dull day is equally good as regards effect, but the exposures are necessarily longer. One of the great difficulties to contend against is the tendency to harsh and hard contrasts.

The lens is the most important tool for architectural work. The value of modern anastigmatic lenses to the architectural worker can scarcely be over-estimated. If the lens covers ninety-five to one hundred degrees, it allows the rising front to be freely used without any risk of the corners of the picture being cut off.

With regard to perspective, it should be recognised that the relative sizes of objects at different distances is independent of the focus of the lens, and depends entirely on their relative distances from the camera. A length of focus rather less than the length of the plate to about one and one-third times appears to be the most satisfactory.

In photography the most natural and pleasing effect is obtained if the camera is placed as near as possible to the normal height of vision, that is 5ft. to 6ft. from the ground. Buildings are designed to be seen from the ground, and the character of the work at different elevations is largely due to this fact. It is only necessary to ask you to compare the effect of photographing the exterior of a building having a large projecting cornice 15ft. or 20ft. above the ground, first from the ground and afterwards from a height of, say, 30ft., to emphasise this point. In the first case all the work of the cornice is represented as it appears to the observer; in the second this cornice is shown as a plain, flat surface, with perhaps a few gutters for the rain to run off.

Exposure is a difficult problem in interior work, so many factors have to be taken into consideration. It is impossible to formulate rules, as the conditions change so much, but a well-lighted cathedral nave will be fully exposed in eight or ten minutes, using f/32, and a plate of the speed of Ilford Ordinary in the best spring or early summer light, while for the choirs of most cathedrals, which are generally very dimly lighted, and the light is strongest on the upper light stonework rather than on the dark oak stalls, where the photographer wants it, an hour and a half to two hours would be necessary under the same conditions.

A subject should be rendered as it appears; a very dark crypt, for example, if one remains in it a long time, has its details plainly visible, but it is still dark, and should appear so in any representation that claims to be good, and a light interior should be light; any other rendering is false and incorrect. Light buildings are frequently shown dull and gloomy, because such an effect is considered by many to be more impressive and pictorial; it appears, however, to be due to a thoroughly false conception of what constitutes "quality" in a picture.

In a pictorial photograph of architecture detail and sharp definition are as essential as in any architectural photograph. There is so much character in the architecture itself that the photograph fails completely if it does not reproduce it. If detail and definition are lost, the character is lost also; retaining either is not inconsistent with true pictorial quality.

The foregoing paper is given *in extenso* in the issue of "Photography" for January 18th; it is also illustrated by several line blocks showing defects and remedies in architectural photography.

JOHN RUSKIN.

MR. JOHN RUSKIN is dead. Attacked with influenza on Thursday last, he passed away at two o'clock on Saturday afternoon at Coniston, within three weeks of his 81st birthday. So ends a great career; truly great in that it was noble and strong and good, and exerted a powerful influence towards the amelioration of human life and work, and the general uplifting of humanity. The value of Ruskin's teachings is inestimable, for they are far-reaching, and touch those hidden and subtle springs which form the source of our actions and thoughts. He made men think, and made them take interest in what they were thinking about; he showed them this was right and that was wrong, and why it was so. Idealist and critic, teacher and master, poet, prophet—such was John Ruskin. And his death breaks the thread which connected us to one of our greatest countrymen, one to whom the world will always point as a great fighter in the cause of Truth and Liberty.

Mr. Ruskin, son of a London merchant, was born in (now No. 54) Hunter Street, Brunswick Square, on Feb. 8th, 1819. He was educated at Christ Church, Oxford, gaining the Newdigate prize for English poetry in 1839. He next devoted himself to painting, but so early as 1836 he had entered a field in which he was destined to be an enthusiast and fighter. He wrote a paper in defence of Turner, and though it was not published at the time, the year is significant as marking the beginning of his battle on behalf of modern art. The Turner study, so to say, developed into the first stage of the famous "Modern Painters," the opening volume of which appeared in 1843.

Therein he sought to prove the superiority of modern landscape painters, and more especially of Turner, to the Old Masters. Other volumes of this work appeared at intervals till 1860, and in these later portions he travelled over a wide area, and the book became a discursive treatise on the principles of art, with artistic and symbolical descriptions of nature written with a boldness of imagination that had never been known before. The critics were contemptuous, but Ruskin's writings undoubtedly had a great influence on the art of his time.

In 1849 he published "The Seven Lamps of Architecture," in which he tried to inculcate a new and loftier conception of the significance of domestic architecture; and in 1851-3 "The Stones of Venice" followed with similar purport. Both these books, as well as the later editions of "Modern Painters," were illustrated with beautiful drawings by the author. About this time pre-Raphaelitism began to be talked about, and John Ruskin took up the cause. He was its first literary advocate, and he defined the aim of the movement as being "To paint things as they probably did look and happen, not as, by rules of art developed under Raphael, they might be supposed gracefully, sublimely, or deliciously to have happened." In this controversy Ruskin wielded a vigorous pen, and, indeed, all his life he has been in the midst of controversy. He attacked some of Whistler's pictures, and suggested that they were like throwing a pot of paint in the face of the British public, to which Mr. Whistler replied that Mr. Ruskin's opinion on art was likely to be of the same value as that of the policeman who watched the gallery.

Ruskin had a curious fancy in titles, and you could usually be certain that the title gave no indication of the contents. For instance, "Sesame and Lilies" consists of lectures on good literature; "Ethics of the Dust" is a set of essays on crystallisation; and in "Unto this Last," which Ruskin considered the best of his books, he attacks the current views of the "dismal science." From 1871 to 1884 he wrote a series of "Letters to the Workmen and Labourers of England," and these were gathered into a book called "Fors Clavigera." One of the most charming books of autobiography we have is his account of his early days, written under the title "Praeterita."

Ruskin held the position of Slade Professor of Art at Oxford from 1869 to 1879, and when he was re-elected in 1883 the crowd that came to hear him was so great that he had to deliver each lecture twice. In 1871 he gave £5,000 for the endowment of a master of drawing at Oxford. Subsequently he founded a museum at Walkley, near Sheffield (in 1890 presented to Sheffield itself), and presented to it part of his priceless library and art treasures. In later years he resided at Brantwood, on Coniston Lake, in his beloved Lake District, and there it was he died.

The funeral has been fixed to take place at Coniston Churchyard to-morrow (Thursday) afternoon. The remains of Mr. Ruskin will lie in state in Coniston Churchyard from noon to-day.

Correspondence.

PENCIL MARKS ON LATRINE WALLS.

To the Editor of THE BUILDERS' JOURNAL.

GLASGOW.

SIR,—With reference to the reply on page 355, in the issue for January 10th, a schoolmaster friend of mine has adopted a very effective mode of preventing markings on walls, so common about a school. When he finds a new-comer has taken to marking the walls he reads the story of David in the cave of Adullam; the rest can safely be left to the other boys in the school.—Yours faithfully,

ISAAC LOW.

New Buildings in Inverness.—A block of buildings 240ft. long and four storeys high is to be built in Church Street and Queensgate at an estimated cost of £25,000. There will be shops on the ground floor and offices above, while accommodation is to be made for a hotel in the centre of the building. Mr. W. L. Carruthers, of Union Street, Inverness, is the architect.

London Water: Royal Commission's Report.—On Monday morning last the final report of the Royal Commission on the London Water Supply (in the form of a Blue-book) was issued. They are satisfied that the present sources of supply will be sufficient up to 1941. With regard to the Welsh water scheme, they seem to indicate that before this time a better scheme will have been found. The Commissioners are unanimous in their conclusion that it is desirable that the undertakings of the water companies should be acquired and managed by a public authority. They come to the conclusion, also, that it is not desirable that the London County Council should be the purchaser, but that the companies' undertakings should be transferred to a permanent Water Board, consisting of not more than thirty members, appointed by the county councils of London, Middlesex, Surrey, Essex, Hertford, and Kent, the West Ham Council, and the Thames and Lea Conservators.

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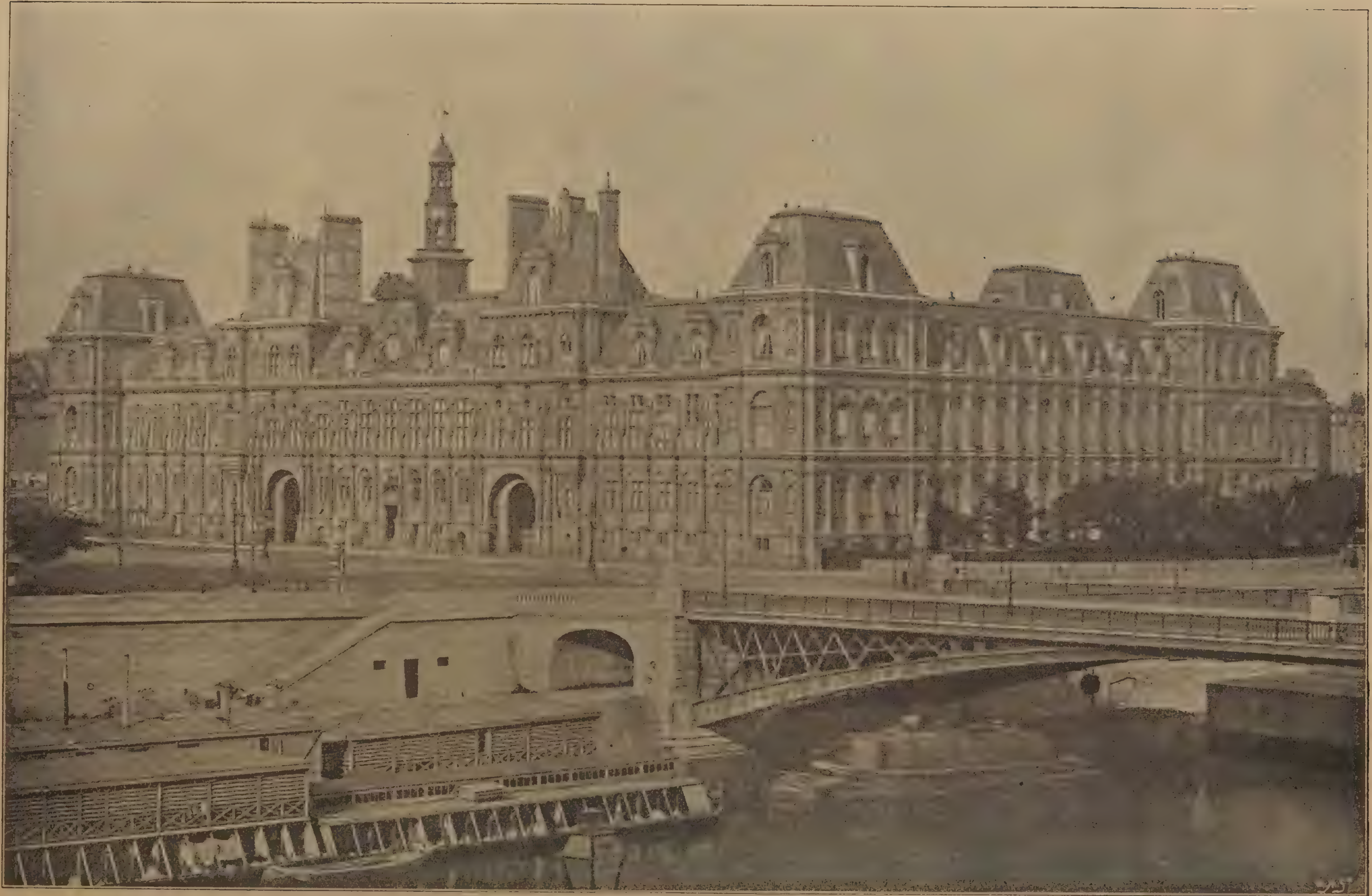

GENERAL VIEW OF THE HOTEL-DE-VILLE, PARIS, BEFORE THE FIRE. From a Photograph taken in 1867.

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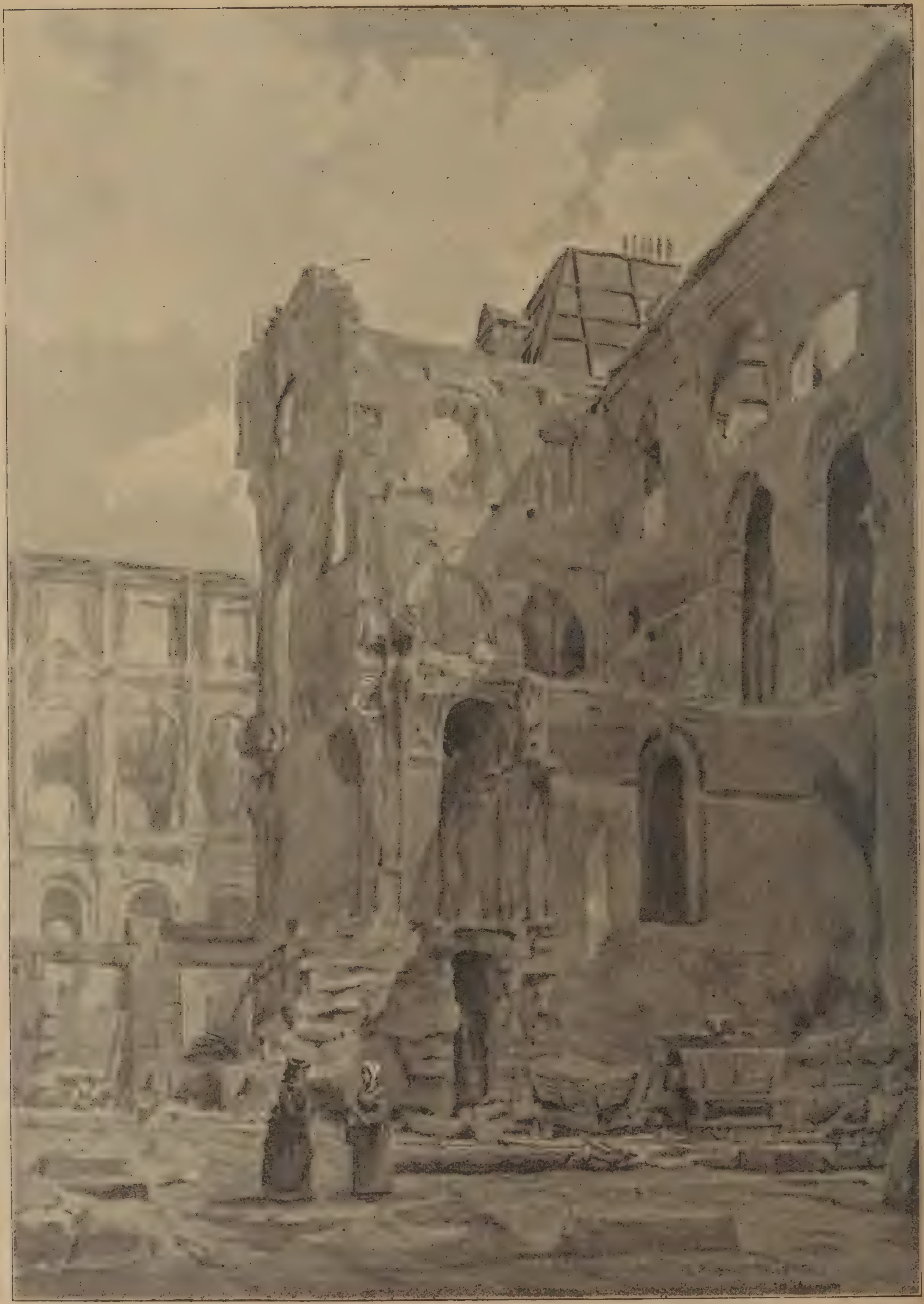
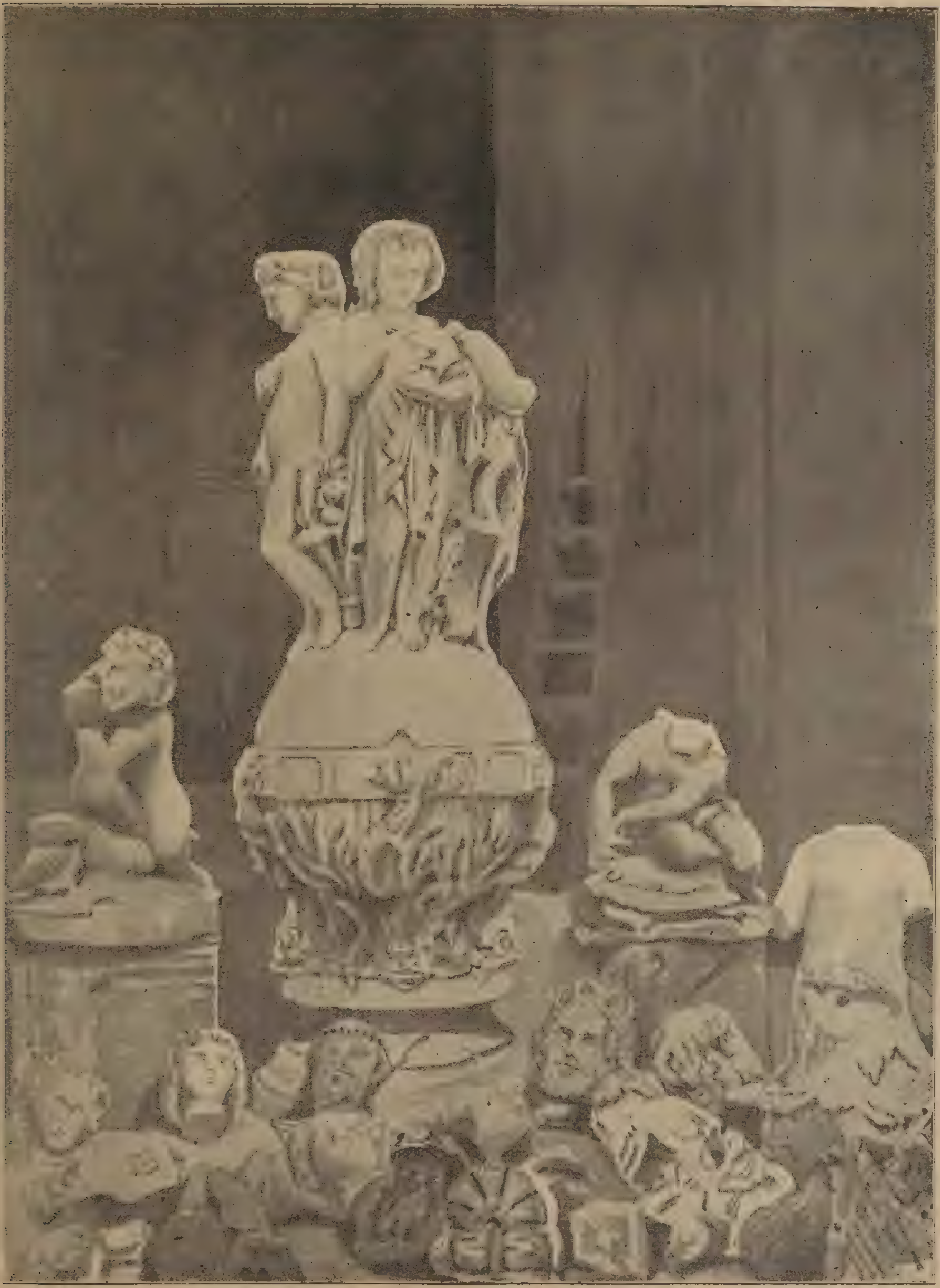


THE CENTRAL COURT (COUR-D'HONNEUR) OF THE HOTEL-DE-VILLE, PARIS.

Drawn by R. Phene Spiers, F.S.A., F.R.I.B.A.



GROUP OF SCULPTURE IN THE CENTRE OF AND ROUND THE FOUNTAIN UNDER THE HORSESHOE STAIRCASE OF THE COURT OF HONOUR, HOTEL-DE-VILLE, PARIS.

DRAWN BY R. PHENE SPIES, F.S.A., F.R.I.B.A.

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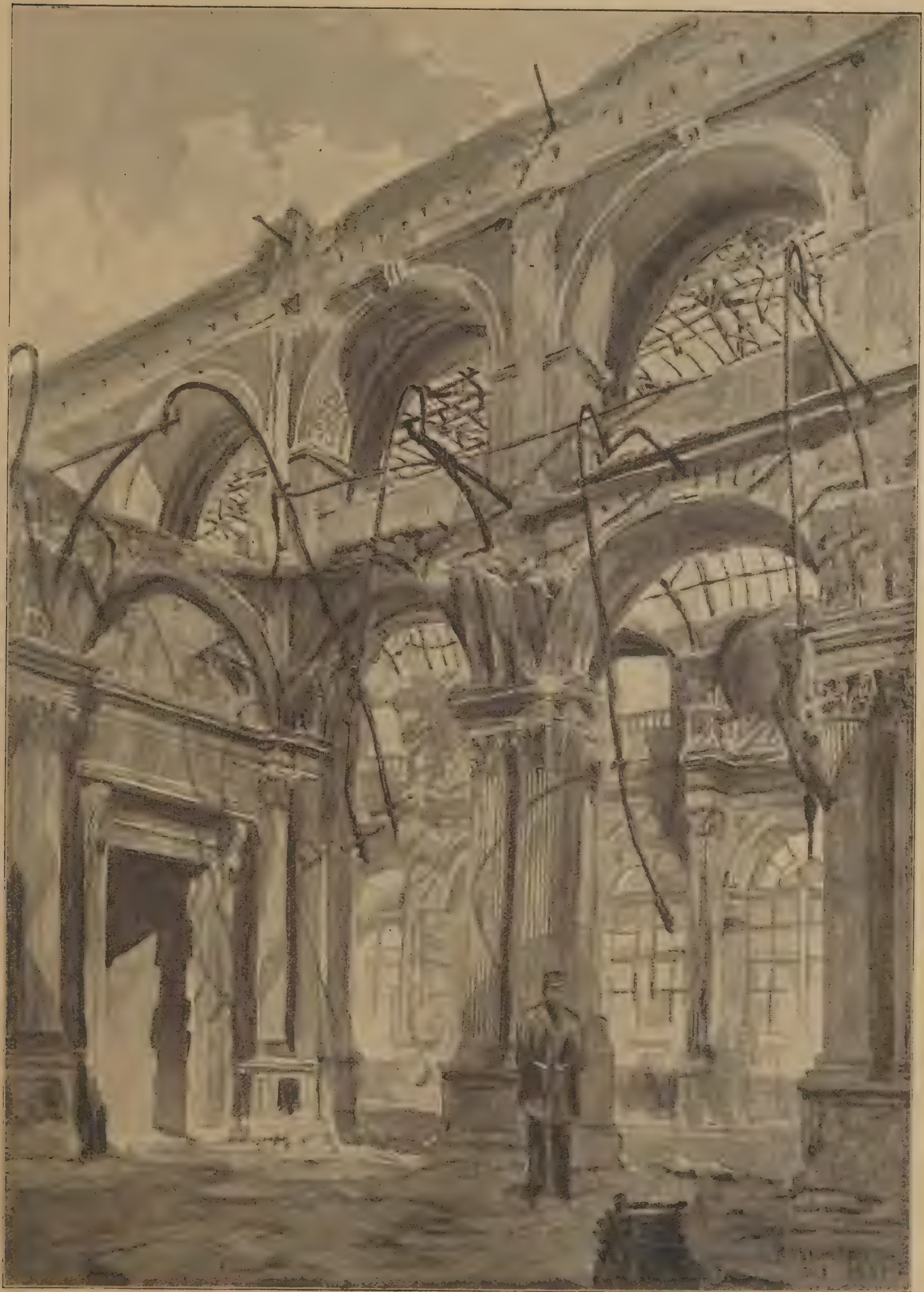

THE SALLE DES CARYATIDES, HOTEL-DE-VILLE, PARIS.
Drawn by R. Phene Spiers, F.S.A., F.R.I.B.A.

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R.I.B.A.

A TRIBUTE TO JOHN RUSKIN.

PRIZE AWARDS.

AT the meeting of the Royal Institute of British Architects last Monday evening the chair was taken by Mr. J. M. Brydon (vice-president). After the passing of the minutes, the chairman referred to the death of Mr. Ruskin, an honorary Fellow of the Institute. Everyone must feel, said Mr. Brydon, that a great personality, who had been a power in this country for the past half century, had passed away. No man influenced architecture as Ruskin did. He was responsible for that wave of Venetian Gothic which passed over our country. He was probably the man who first woke up the English people to a knowledge of what Art meant, Art in the life of the people as an ennobling factor that raised men and made them think of higher and nobler things.

Ruskin's Influence on Architecture.

Probably no work had had more influence on architecture in this country than that magnificent book "The Seven Lamps of Architecture," and particularly those chapters that dealt with Truth and with Sacrifice. The idea of truth was held in a very hazy fashion, and probably the idea of sacrifice for art's sake had never occurred to ninety-nine out of a hundred people in England until Ruskin told them what it meant. Probably we were too near to Ruskin now to estimate aright the part he played in English life, literature, and art criticism. He (Mr. Brydon) suggested to the Literature Committee that a paper might be written on the great influence of Ruskin on architecture in this country. He concluded by moving a vote of condolence with Mr. Ruskin's relatives. Letters were read asking for contributions from architects towards the Artists' War Fund and the exhibition now open at the Guildhall. All communications may be addressed to Mr. M. H. Spielmann at the Arts Club. The vote having been unanimously adopted, the president proceeded to announce the

AWARDS OF PRIZES AND STUDENTSHIPS

made by the Institute for 1899-1900. These were as follows:—

The Institute silver medal and twenty-five guineas for a review of the architecture of the Elizabethan period (about 1550-1620) was gained by Robert W. Carden ("Thelma"), of London.

The Institute silver medal and ten guineas for a set of measured drawings of ancient buildings in the United Kingdom or abroad, was gained by James B. Fulton ("Unicorn"), of London, N.W., for his drawings of St. John's College, Oxford. A certificate of honourable mention was also awarded to H. Inigo Triggs ("White Wheel"), of London, W., for his drawings of Raynham Hall, Norfolk.

The Soane Medallion and £100, for continental travel, was gained by Cyril E. Power (S. Barbara), of London, W.C., for his design for a School of Fine Art.

The Owen Jones studentship (certificate and £100), for travel and study of colour, was gained by George A. Paterson, of Glasgow. Medals of merit were also awarded to James B. Fulton and J. Hervey Rutherford.

The Pugin studentship (silver medal and £40), for travel in the United Kingdom, was gained by James M'Lachlan, of Edinburgh. Medals of merit were awarded to E. W. Turner, of Peterborough, and J. A. Woore, of Derby.

The Godwin Bursary (silver medal and £40), for travel outside the United Kingdom, was gained by Sidney K. Greenslade, of Exeter.

The Tite prize (certificate and £30), for travel in Italy, was gained by Percy E. Nobbs ("Edificaturus"), of Edinburgh, for his design for an isolated clock tower and belfry. A medal of merit was awarded to William Arthur Mellon ("Bow Bells"), of London, E.C.

The Grissell gold medal and ten guineas, for design and construction, was gained by Charles E. Varndell ("Loire"), of London, S.W., for his design for a spiral staircase.

The Ashpitel prize of books, value £10, was gained by Raymond Turner Barker, of London.

The Council approved of the work of Mr. J. Hervey Rutherford (Pugin student 1899) and of Mr. James B. Fulton (Tite prizewinner 1899), and of the report of Mr. W. Wonnacott (Godwin Bursary prizewinner 1899). With regard to the work of Mr. A. E. Henderson (Owen Jones student 1897), the Council were so pleased with it that they had decided to grant the author an extra £50, to enable him to continue his studies in Constantinople.

Mr. Basil Chamneys, B.A., then read his paper on

THE JOHN RYLANDS LIBRARY, MANCHESTER.

The circumstances, he said, which led to his being asked to undertake the building of the Rylands Library dictated, to a considerable extent, its general style and conformation. With a view to the selection of an architect, Mrs. Rylands and her advisers had visited many buildings, among others Mansfield College, Oxford, with which, and especially with the Library, she was satisfied as fulfilling generally the intention and corresponding with the idea she had formed. Being commissioned to prepare a plan, the author concluded that the type of building must correspond to some extent to that of a college library, and that the style most adapted to the idea, and likely to satisfy his client, was that of Mansfield College. There were, however, special requirements which college libraries do not include. A very large number of books were to be accommodated. There were to be two independent departments—one for reference books, the other for loan—involving two separate entrances. Three large rooms were to be provided, one specially large for the purposes of conference, and two smaller for ordinary committees; rooms for the librarians in close communication with the principal library; refreshment rooms for staff and visitors, with the necessary offices; rooms for unpacking, sorting, &c.; a caretaker's house, detached, but in close connection with the library; accommodation for engines and dynamos for electric light, and basement for hot-water washing and stowage, and for the preservation of muniments; a large and important vestibule, and ample and imposing staircase or staircases. The building to be as far as possible fireproof.

Architectural Conditions.

The existence of ancient lights on almost all sides of the site dictated to a large extent the general conformation. As the position made it impossible that any but the steepest roof could be rendered visible, and there was no loss of architectural effect involved, timber roofs were omitted almost altogether. The stone bantling was covered with concrete brought to a level, and covered with asphalte.

The author then gave a full description of the building, the disposition of the rooms, and the manner in which he had met the various requirements.

With a view to obtaining adequate daylight for the library itself, to avoid unnecessary interference with the rights of adjoining owners, and to secure quiet, the library was placed on the upper floor, some 30ft. from the pavement level, and set back about 12ft. from the boundary line at the sides. On the lower floor on either side a cloister or corridor, giving access to the ground floor rooms, occupies the remaining space, and is kept low (about 9ft. high internally) so as to allow of ample windows above it for lighting the ground floor rooms, which are about 21ft. high. The whole of the front of the building is occupied by a spacious, vaulted vestibule, the ceiling being carried on shafts.

The library consists of a central corridor 20ft. wide, and 125ft. long, terminating in an apse, together giving an extreme length of 148ft. The central hall is 44ft. from the floor to the vaulted ceiling, and is throughout groined in stone. It is divided into eight bays, one of which is on one side occupied by the main entrance, while the rest open into reading recesses. On this floor there are fifteen recesses occupied by bookcases. Two staircases, one at either end of the main library, lead from the lower to the upper floor. The reading spaces on both floors have bay windows; on the lower floor their ceilings are of oak ribs and modelled plaster; on the upper floor they are vaulted.

Material and Colour.

Adjoining the caretaker's house, which is separated from, but in immediate connection with, the main building, is a spiral staircase which leads to all the floors of the main building, and under the house are the boilers and furnace for the hot-water warming. The material used is mainly stone from quarries near Penrith. That used for the interior throughout is shawk, a stone that varies in colour from grey to a delicate tone of red. Much care has been exercised in the distribution of the tints, which are for the most part banded in an irregular combination. Many of the stones show both colours in a mottled form and serve to bring the tints together. As towards the completion of the building it proved impossible to obtain a sufficient quantity of mottled stone, the main vaulting of the library had to be built in a way that gives a more banded effect than was originally contemplated.

Appropriate carvings decorate the several parts of the exterior of the building. Facing the main doorway is a symbolical group, carved in the stone employed throughout the interior of the building. The sculptor was Mr. John Cassidy, of Manchester.

Statuary and Stained Glass.

A series of portrait statues by Mr. Robert Bridgman, of Lichfield, has been designed and arranged so as to represent many of the most eminent men of different countries and ages in the several departments of literature, science, and art. These are placed for the most part in pairs marking both correspondences and contrasts in character and achievement. The statues, twenty in number, are ranged in niches along the gallery front. They are supplemented by a series of pictured effigies in the two stained glass windows, designed and wrought by Mr. C. E. Kempe, each window containing twenty figures, taken, wherever possible, from contemporary portraits. The great north window is symbolical of Theology. The south window represents Literature and Art. The main design of the library, in its bearing upon philosophy, ethics, and intellectual culture, is further illustrated by a series of Latin mottoes, carved on ribbon scrolls between the windows of the clerestory, a painter's device being below each motto. The fronts of the bookcases consist of very large sheets of plate-glass (9ft. 9in. by 2in.) contained in gun-metal frames. The exclusion of dust is provided for by rolls of velvet, made elastic by the insertion of wool, which, when the doors are closed, are pressed between the door and a fillet.

A discussion followed, in which Messrs. Aston Webb, Beresford Pite, H. H. Statham, and others took part. All the speakers expressed generous appreciation of the library, and a vote of thanks was heartily acorded to the lecturer, who, in response to requests, gave further details on several points connected with the building.

More Light on the District Railway.—The District Railway Company have commenced a new system of lighting their stations, which are often invested in semi-darkness. At present the light is excluded by the shelters for passengers on the up and down sides of the platform; in future the shelter roofs will be pierced, and fitted with glass skylights. These improvements have already been carried into effect at Westminster Bridge Station, and the result is most satisfactory. Five large skylights have been let into the roofs of the shelters on each side of the platform, and care has been taken to prevent the percolation of rain-water through the framework.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"*The moment a man can really do his work, he becomes speechless about it. All words become idle to him—all theories.*"—RUSKIN.

Vacancies at the Academy. A general assembly of the Royal Academy has been convened for Tuesday next, when the three vacancies in the ranks of the Associates will be filled. Two of these are due to the co-option of two Associates, Messrs. Abbey and Gregory, and one to the death of Sir Arthur Blomfield. There are thus two painters' places to be filled and one vacancy caused by the death of an architect. An architect will probably be elected to supply this last vacancy, though there is no rule. At present, amongst the Associates there are only two architects, Messrs. Bodley and Aston Webb, and Mr. Aston Webb's election is of recent date. The claims of an outside architect are generally much better known to the members of his own profession than to the public, who take no interest in plans, and, unfortunately, very little in buildings. For this vacancy Mr. Belcher is at present certainly the favourite. Then there are the other two vacancies. Though they are created by the promotion of painters, it is not unlikely that they will be filled by the election of a painter and a sculptor. Mr. Joseph Farquharson has been in the running, and well forward in the running, for the last two or three years. If a sculptor should be elected, the choice is said to lie between Mr. Pomeroy and Mr. Drury.

Romsey Abbey. ROMSEY Abbey Church, in Hampshire, is proposed to be restored, for which £5,000 is needed. The monastic buildings have long ago disappeared, but the magnificent church remains—possibly because the nave always served the purpose of a parish church. It is the most perfect example of a Norman abbey church of moderate dimensions in England, being about 240ft. long by 120ft. across the transepts. The whole building is, as far as the shell goes, Norman work, though the western portion of the nave was reconstructed in the thirteenth century and the eastern windows of the choir were altered during the fourteenth century. A lady chapel was added about the same period, but has ceased to exist for many years. Romsey Abbey Church is remarkable for the singularly regular treatment of its plan, one side being a counterpart of the other, and it is probably the only ancient church in England in which this is to be seen. Like most of the Hampshire churches, the tower is low and does not rise more than a few feet above the roofs of the "crossing." It is crowned by a lantern of wood covered with metal. Although the exterior of the building is rather plain, there is a considerable amount of carving to be seen internally.

Wellington's Monument. THE Dean and Chapter of St. Paul's Cathedral have accepted an offer from the Department of Works to place around the Wellington Monument a barrier ornamented with twelve of those admirably-executed little bronze lions modelled by Alfred Stevens, the sculptor of the monument, which for many years stood on the pillars of the boundary railing of the British Museum. This railing was removed about two years ago, and the lions, which possess great merit as works of art, were taken care of by the Department. Several of them are to be seen in some of the galleries of the Museum ornamenting the staircase and balustrades, and it will be generally conceded that no more appropriate site could be found for the remainder than that chosen in St. Paul's Cathedral, around the beautiful monument which is universally regarded as Stevens' masterpiece.

A Town of Ornament. OUDEYPORE is a name which is doubtless unknown to most persons in this country, except for its seeming connection with other Indian names, which appear to many here to have a common suffix with a peculiar prefix. The reason for this is of course that we do not understand the language. But, for all that, Mr. Julian Ralph says in "Harper's" that Oudeypore lies besides a blue lake in a valley rimmed by purple hills, and looks as if it were cut out of statue marble. It is walled, and when you pass through one of its gates you step back a thousand years. No two buildings are of the same height or width, or shape, much less are they of the same pattern. The streets are narrow and twisting, and there are no pavements. The shops on either side are like doorless cupboards, for the walls have never been built in front of the first storey of the buildings. Most of the houses are two and three storeys high, with upper balconies and bay windows, made of panels of stone lattice so finely cut sometimes as to suggest lacework. The buildings, which rise straight up with flat fronts, are never bare, but are decorated with pilasters, half-columns, carved panels, or other ornaments. Wherever there are shops the storeys above are generally supported upon strong columns with elaborate capitals, between which flat stones are projected out and down, at an angle of 40deg., to shade the shops, as we use canvas awnings. "Wherever there were old houses deserted and ready to tumble down," continues Mr. Ralph, "one saw relics of ornaments as rich as any of the newer ones boasted. Now you can begin to imagine Oudeypore, all white formed of such houses, with here and there a great temple made of masses of carved work, or ornament piled upon ornament. Imagine all this enclosed by a battlemented wall and moat on one side, by a lake resembling a sheet of turquoise on the other, and the whole dominated by a palace of enormous size and of immaculate whiteness."

The Benefits of Art Galleries and Schools. THE Right Hon. Jesse Collings, M.P., said recently, at the distribution of certificates to the students at two branch schools of the Birmingham Municipal School of Art, that it was the duty of art teaching to distinguish between what was ugly and what was beautiful; to see the difference, for instance, between a machine-made article and another into which a workman had evidently put his mind; to see in their buildings the difference between a common pattern and one which was the result of the artistic feelings of the architect; for instance, to be able to distinguish between the General Post Office in New Street (Birmingham) and some of their beautiful Board schools. The effect of art teaching upon the population generally would be not only to improve the appearanc of their homes and surroundings, but in their corporate capacity to insist upon beautiful buildings and beautiful public works. For example, there was now a question before the Corporation of the city whether in the tramway system they were about to inaugurate there should be overhead wires or underground cables. He hoped the artistic taste of Birmingham was so far developed that it would insist that the city—in some respects a very fine city—should not be spoilt by overhead wires. He believed they had the finest material in the world so far as the working men were concerned, and so far as their capacity went; but he was afraid that up to recent times very little in the form of training had been bestowed upon them, and in that respect they had to work against odds as compared with their foreign competitors. The production of skilled draughtsmen and good designers was really at the present time a national question—it was one upon which the prosperity, even the existence, of their manufactures depended. The teaching of drawing, even though it might not be carried to any degree of excellence, must have a great effect on learning. Thirty years ago the Art Gallery was a single room in the Free Library building. Now they had one that was the pride of Birmingham, and one of the glories of the city. The educational advantage of such an institution was unseen, but it was very great. Art, therefore, was no longer a perquisite of the rich, but belonged to the people in their corporate capacity. Each one of the working classes could not possess those high-class, expensive works of art, but in their corporate capacity they could have picture galleries and art schools such as no private individual could vie with.

The Cartwright Memorial Hall. THE designs and plans for the Cartwright Memorial Hall, Bradford, are now completed, and the tedious, but necessary, labour of preparing estimates of quantities has at length been finished, and tenders are invited for the completion of the building. The tenders are to include the whole of the work done, in one tender for all trades. They must be delivered by February 6th next, so that by the next Council meeting some definite idea of the cost of the new building may be obtainable, though it is doubtful whether the arrangements will be completed in time for the acceptance of a tender to appear on the agenda of that meeting. Since the plans and designs were drawn, a rise of from 10 to 15 per cent. has, it is said, taken place in the price both of materials and of labour, so that it is possible that the lowest tender will exceed the £40,000 which Lord Masham provided for the purpose of the erection of the hall. In this case it is conceivable that the Council will be asked to make up the deficiency, to avoid, as has been the fate of more than one public work in Bradford, "spoiling the ship for a pennyworth of tar."

The Modern Builder. ST. PAUL'S CHURCH, Chippenham, is the latest addition to the list of churches recently built that have showed a much too rapid decay. At a meeting a week or so back, the rector, the Rev. J. F. Griffiths, said no improvements had been carried out in the church since it was built, forty years ago. The wind whistled round the reading desk like a hurricane, and pieces of plaster fell from the roof during service, while the lighting and heating arrangements were very defective. It was suggested that the exterior of the roof should be covered with slates in preference to the present stone tiles, and that the interior should be lined with wood instead of plaster. Eventually it was decided that the diocesan architect should be consulted as to the state of the building and the probable cost of renovation.

Last of the Holborn Inns. WHAT a deal of interest has been centred round the famous old coaching inns of Holborn, which, one by one, have been disappearing quite latterly. A site for a further extension of the Prudential Assurance Company's offices was cleared by the demolition of Furnival's Inn and "Woods's" Hotel, both built about eighty years ago, the former standing on the site of the block erected in Charles the First's reign, the latter on the site of the hall of the inn. The demolition for the company's offices has embraced "Ridler's" Hotel, which in the days of its chiefest fame as a coaching house was known as the "Bell and Crown," and had retained its pristine aspect of old-fashioned comfort, together with the two quaint old houses, with three shallow bayed fronts at the corner of Leather Lane. Next, eastwards, a Great Western Railway Company's receiving office replaces the "Old Bell," distinguished by its courtyard surrounded with "galleries" and "boxes," and by the coat of arms of Gregge of Bradley, Cheshire, and Starkye of Stretton, quartered, upon its red-brick front. The authenticated history of the "Old Bell," formerly the "Bell," or "Blue Bell," begins with the record of its sale for forty pounds by a conveyance dated March 14th, 1538. Then next east stands the "Black Bull," of which the site is offered for sale on a building lease. The "Black Bull" has upon its front a large sign of a black bull, somewhat out of proportion with the later fortunes of the hostelry, of which the inn yard was taken some years ago for the erection of tenements for the working classes. Its destruction will involve the disappearance of the last survivor of the old coaching inns in Holborn. When that takes place the glory of ancient prestige will belong entirely to the old timbered houses that face Holborn Bars.

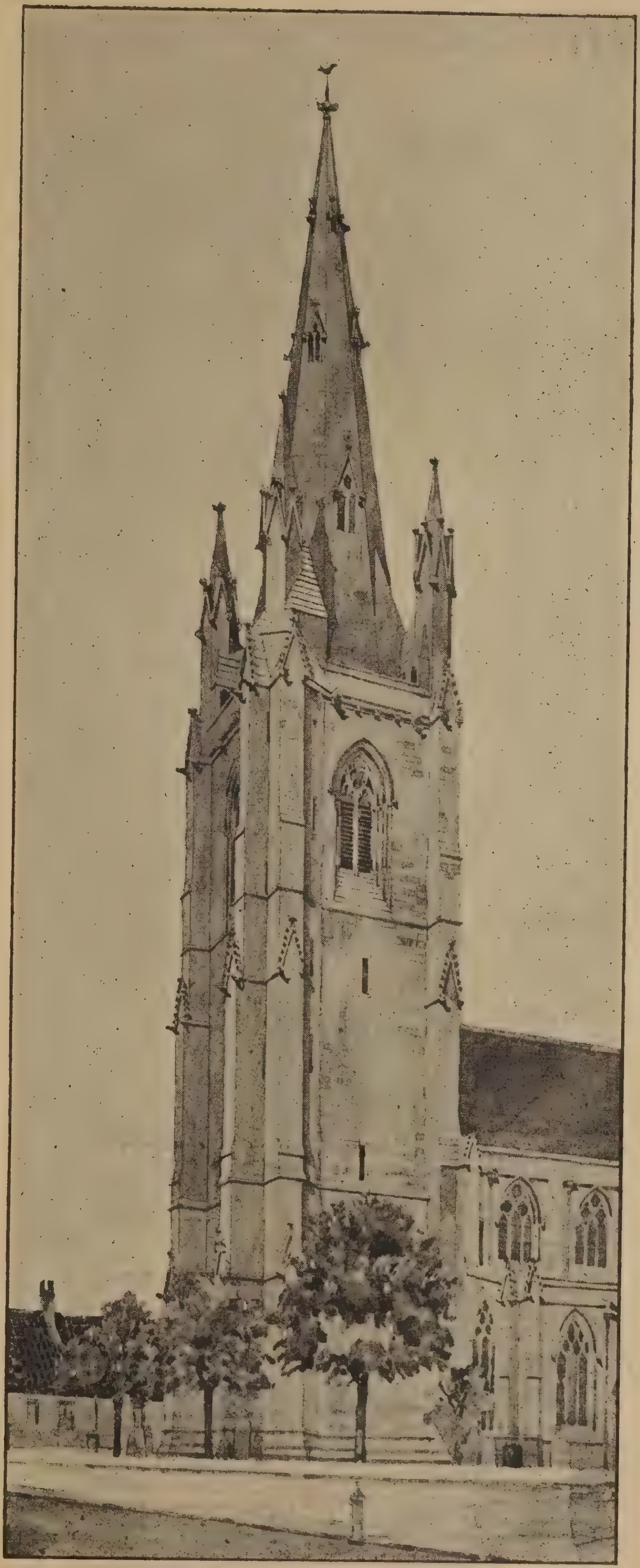
Labourers as Humourists. Labourers of the present day, are not, as a rule, a highly interesting class, but the quality of humour has not been entirely banished from their kind. A specimen of this was found last week during the hearing of a building accident claim at the Shoreditch County Court. This is what ensued in the course of cross-examination: Counsel: What are you?—A bricklayer.—Is that what you would describe yourself as?—Well, a builder—not exactly a builder, but a builder's labourer.—Well, we'll call you a builder's labourer.—I am a navvy.—Come, now, what really are you?—Well, anything in the building line.—Who had charge of the job?—Me, I suppose.—Then you were the foreman?—No.—Then what were you?—Chief hand. The funniest part of the whole story occurred at the conclusion of this interesting dialogue, for it was then discovered that this estimable witness knew nothing about the accident.

Assam's new Consulting Architect. The recently-appointed consulting architect to the Government of Assam is Mr. W. Arundell, whose connection with the Society of Architects dates from its earliest commencement in 1884. He served on the Council from June, 1886, till November, 1887, when he resigned upon leaving this country for India, where he has been engaged in designing railway buildings, and in railway engineering generally, for the Delhi Umballa Kalka, the East Coast, the East Indian and the Assam Bengal Railways. The latter he now leaves for independent practice in Calcutta. Throughout this time he has designed and superintended the erection of many and various other buildings in Umballa, Rawalpindi, Delhi, Calcutta; and in Shillong, where all the buildings were totally destroyed by the earthquake of June 12th, 1897, there will shortly be a new Government House, church, many public offices and private houses from his designs. Mr. Arundell served his articles with the late Mr. J. N. Brown, of Norwich, and for some years was in the office of Mr. Basil Champneys, before going out to India.

Heckington Church, Lincolnshire. The tower and spire of this church, an illustration of which is given on this page, are most refined in proportion and detail, and form one of the best examples of the Decorated period in the country. The masonry is extremely good, the joints being very fine, and the careful finish of the detail is carried out even to the top of the spire. The tower is about 25ft. square at the bottom, and it is about 168ft. to the top of the spire. The church is very interesting throughout. Our illustration is from a drawing by Mr. J. Hervey Rutherford, one of a set that secured the Pugin studentship prize granted by the Royal Institute of British Architects in 1899.

Housing Problem.—A parliamentary petition is now being signed by members of London and Provincial Trades Councils, Trade Union Secretaries, and branches of all societies and clubs for working men, with reference to the better housing of the working classes.

A Woman's Monument.—The obelisk which is to be put up in Darmstadt by the women of the Grand Duchy of Hesse, in memory of the late Grand Duchess Alice, is surrounded by three female figures, and has in front a relief portrait of the late Princess. This design was chosen and approved by the present Grand Duke of Hesse, and is to be carried out by Professor Habich, of Darmstadt.



HECKINGTON CHURCH, LINCOLNSHIRE. DRAWN BY J. HERVEY RUTHERFORD.

Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

ESTATE CLERK OF WORKS.

ANXIOUS writes :—"As a subscriber to your paper I should be glad if you would inform me which is the best paper in which to advertise for a post as an estate clerk of works?"

We have no doubt that the querist will find our own columns most satisfactory for such an advertisement as he mentions.

HANDBOOK ON ISOMETRIC PROJECTION.

PUPIL writes :—"Could you inform me of a small handbook on Isometric Projection?"

The best small book our correspondent can have is Davidson's "Orthographical and Isometrical Projection," price 2s. post free, from B. T. Batsford, 94, High Holborn, W.C.

CITY AND GUILDS EXAMINATIONS.

PAISLEY, N.B.—SCOT writes :—"What are the necessary requirements of a candidate who wishes to sit at the City and Guilds, &c., Carpentry and Joinery (Honours) Examination?"

The conditions now in force in the technological examinations of the City and Guilds of London Institute will be found in the "Programme, with Syllabus of Subjects, &c," published by Messrs. Whittaker and Co., of Paternoster Square, London. This programme can be obtained through any bookseller, price 10d. net.

MAKERS OF CLEFT OAK FENCING.

NOTTINGHAM.—F. P. writes :—"Could you give me the name and address of any firm who make the cleft oak fencing which is used in residential districts in the south of England?"

Messrs. Taylor and Brooker, British Timber Works, Dorking; J. and S. Agate, Horsham; G. F. Braggins and Co., Banbury; C. R. Stone, London Road, High Wycombe; H. Hill, King Street, Maidenhead; T. Turner, Limited, Cassiobury Mills, Watford; or Rowland Brothers, Fenny Stratford, will supply the cleft pales, or quote for the "park" fencing erected complete. H. E.

SOCIETY OF ARCHITECTS EXAMINATION.

CLAPTON, N.E.—E. S. E. writes :—"Will you kindly let me know when the next examination takes place? Also, if in this examination it is necessary, in order to qualify, to obtain half marks on the whole number of questions set, both obligatory and voluntary, or on the obligatory only?"

The next examination will be held towards the end of April. It would be best to write to the secretary of the Society, St. James's Hall, Piccadilly, W., for exact information and for form of application. In order to qualify, it is necessary to obtain half marks on the obligatory questions only; but no one with any ambition would aim at a mere pass in any examination. To do so generally means failure.

QUANTITY SURVEYING.

BLACKPOOL.—STUDENT writes :—"Which would you recommend a youth to study most, quantity surveying or architectural work? What is the general routine in a quantity surveyor's office, and what is the salary paid? Whose book on quantity surveying would you recommend?"

The choice between quantity surveying and architecture should depend upon opportunity, aptitude, and inclination. Quantity surveying used to pay very well, but there is not much difference now in any of the professions. Skill and industry will always command a fair return in whatever branch it may be applied. Leaning's "Quantity Surveying" (Spon, 15s.) is the best text-book on the subject, and that describes pretty well the routine of a quantity surveyor's office. HENRY ADAMS.

CONTRACTOR'S CLAIM UNDER ASSIGNMENT.

CARLISLE.—CONTRACTOR writes :—"I made a contract with two builders for work at a price per yard. The builders made a deed of assignment to a building society before the work was completed. Is the building society liable for the balance due to me, as they say it has all to be measured over again? What course may I adopt to secure the balance, as they engaged another man to finish the job?"

So far as we can see, the only remedy that "Contractor" has is against the two builders who employed him. The assignment to the building society did not render the latter liable, as between the society and "Contractor," to pay the debt of the builders. To enable him to sue the society, it should have been mutually agreed between the builders, the society and "Contractor," that the society should become responsible to "Contractor" for the debt of the builders, that the builders should be released from it, and that "Contractor" should accept the liability of the society in lieu of the liability of the builders. If "Contractor" did any work for the society, he is, of course, entitled to recover the price or value of that work from them. A. H.

L.C.C. SCHOLARSHIPS.

LONDON.—ANXIOUS writes :—"I propose to compete for the scholarships offered by the London County Council Technical Education Board for workshop arithmetic, including mensuration, building construction, and geometry. What is a good and cheap book on workshop arithmetic? Does 'geometry' mean only plane, or does it include solid? Is there any limit as to the size of drawing paper to be used? I understand the candidate may choose the sort of drawing he submits for building construction. Do they expect a very advanced one?"

Merrifield's Technical Arithmetic and Mensuration (Macmillan, 3s. 6d., and key, 3s. 6d.) is a good book. Geometry in the Technical Education Board examinations means practical, plane, and solid geometry as taught in classes under the Science and Art Department. The size of drawing paper at examinations is usually limited to a maximum of "Imperial," 30in. by 22in., but half cartridge, 13in. by 21in., is a very handy size when there are several sheets. The drawing submitted must be practical, *i.e.*, show actual construction, and not be merely a copy of an elevation from a book. An original design or drawing from measurements taken by the candidate obtains most credit.

HENRY ADAMS.

TESTING PORTLAND CEMENT.

SOUTH KENSINGTON, W.—G. P. writes :—"Will you kindly inform me what are the qualities and which is the proper way of testing the strength of Portland cement, and good blue lias lime. Could you kindly recommend any work bearing on the subject?"

The chief qualities of Portland cement are: (1) Setting and hardening properties, (2) consistency of volume, (3) permanence in water and air, (4) strength under tension and compression, (5) impermeability by water, (6) resistance to wear, (7) resistance to fire, (8) adhesion to brick and stone. Various methods are employed for testing Portland cement. Weight, ~~fineness, tensile strength~~, and adhesive strength are the principle tests. The specification of a good cement is :—Weight—The cement to weigh not less than 112lbs. per striked bushel. Fineness—To be grained so that not more than 5 per cent. residue shall be left on a sieve having 2,500 meshes to the square inch. Tensile strength—The briquettes at seven days (during six of which they shall be immersed in water) shall not break at less than 350lbs. on the square inch. Blue lias limestone is that from which hydraulic lime is principally obtained. It is somewhat variable in quality, sometimes of a feeble nature, and sometimes of a hydraulic nature. The following is an analysis of a blue lias hydraulic lime :—Lime, 78·43; silica, 9·35; alumina, 6·25; oxide of iron, 0·60; water, carbonic acid, &c., 5·10. Practical information as to the materials used in the manufacture, method of making, analysis, and testing of Portland cement; also useful information about blue lias, are to be seen in "Plastering, Plain and Decorative," published by B. T. Batsford, 94, High Holborn, London, W.C. W. MILLAR.

DAMP WALLS.

KENTISH TOWN, LONDON, N.W.—NORTH LONDON writes :—"I have built a private house, but am much troubled with the flank walls, which face west. Whenever we have wet weather in the winter, and there is moisture in the atmosphere, the paper on these walls seems to attract it, and gives one the idea that the wall is damp. The other walls are not affected. By airing the room or by lighting a fire the appearance very soon disappears. My impression is that the wall, being an exposed and external wall, is colder, and so attracts the moisture. The rooms are always very cold. I should be glad if you could suggest a remedy. Would plastering with Portland cement on the outside be a certain cure and make the room less cold? I find it is the same in 14in. and 9in. work. The bricks used are of a good quality."

It is possible that the damp, and consequently cold, rooms are due to the exposition of the flank walls, but it is more probable that the damp penetrates through the walls, or rather through the brick points, owing to defective mortar, especially as the bricks used are stated to be "of a good quality." The bricks may appear good externally, but still be of a porous nature, which, if so, would encourage moisture during wet weather, and thus cause dampness on the interior surface. An effectual remedy may be obtained by plastering the external surface with good Portland cement, which should be laid by a thoroughly practical plasterer, who knows the nature of the material, the proper admixture as an aggregate, and their proper manipulation. As this class of man is now scarce, I will be pleased to send the name and address of a North-London plasterer whose skill in this particular branch is admitted by all thinking men in the trade. Whoever does the work, see that it is done in dry weather, also that the mortar joints in the brickwork are raked out, and carefully dusted and wetted before any cement is laid.

W. MILLAR.

LEGAL POSITION OF ARCHITECTS.

SYDNEY.—X. Y. Z. writes :—"A contract specifies (in the specification) for a house to be built in a certain manner. As soon as operations are commenced, the client requires and orders numerous important alterations to be made, for which prices are given by the builder. As the client, for the sake of economy, knocked off the provision for contingencies, the architect had no latitude to meet any which might arise. The builder made several concessions—put muranese glass instead of 26oz. in glazed screen, better water piping, &c.—to meet which the architect also made several equivalent concessions, allowing a door to be glazed with 26oz. instead of plate glass (the latter being specified), and an attic storey having been added, a door to attic stairs was omitted by tacit understanding between builder and architect. The client now claims that the specification regarding the plate glass and the attic door shall be carried out, ignoring the fact of concessions on the builder's part, which he claims must be gratuitous and not affect the contract. What is the legal position of the architect? Does his discretionary power 'to be done to the satisfaction of the architect' place the decision in his power, or can the client insist that these matters shall be rigidly carried out?"

An architect has no inherent or implied authority to dispense with or vary the specification. The words "to be done to the satisfaction of the architect" do not confer such an authority upon him, and if the client has not given his sanction, expressly or by implication, to the substitution of 26oz. glass for plate glass, or to the omission of the door, the builder must put in plate glass, and put up the door. A. H.

"REASONABLE WEAR EXCEPTED" IN LEASES.

CHELSEA, S.W.—T. J. E. (Polytechnic Lecturer on Building Construction, &c.) writes:—"What is understood by 'reasonable wear excepted,' as included in general leases. The only clause relating to repairs in the lease reads thus: 'The tenant shall leave the house in the some condition as that in which it is at the date of his entry, reasonable wear excepted.' The house in question was rather old, but was in a fairly good condition; it had been repapered and whitewashed, &c. On the tenant leaving the house, the landlord contends that it is in a dirty state and badly knocked about. This the tenant denies, stating that it had only the ordinary wear of a quiet household. The crucial point is the real meaning of 'reasonable wear.' Is the tenant, at the expiration of his tenancy of three years, liable to have the ceilings whitewashed, walls repapered, &c.?"

"Reasonable wear" means that degree of wear that is inseparable from reasonable use. Whatever deterioration in the condition of the premises results from the gradual operation of time or the elements, comes within the term. For example, if paper, paint or whitewash becomes discoloured from those natural causes which are necessarily at work in the course of the use of a house as a human habitation—faded by the sunlight which enters through the windows, or darkened by the smoke which comes from candles or lamps, or by fog, or smuts floating in the atmosphere—the case is covered by "reasonable wear." Further, a certain amount of deterioration caused by the physical contact of the tenant, his family, servants and visitors, and his furniture will also be covered by "reasonable wear." Thus, painted surfaces which are unavoidably touched by those occupying the house, and papered surfaces against which articles of furniture are commonly placed, must inevitably suffer from such ordinary use. The consequent deterioration in their condition constitutes reasonable wear. The meaning and effect of such clauses as that in the case referred to by our correspondent has not often come up for judicial consideration. The obligation to paint and paper is in most instances expressly defined, and then, of course, a difficulty of interpretation can hardly arise. In a case somewhat like the present, when the tenant was bound by his lease, "as often as necessary well and sufficiently to repair, uphold, sustain, paint, glaze, cleanse, and scour, and keep and leave the premises in such repair, *reasonable wear and tear excepted*," it was decided that the tenant, if he had repaired within a reasonable time before leaving, was only bound, in addition to the repair of actual dilapidations, to clean the old paint, &c., and not to repaint. The wear in the present case appears to have been "reasonable," but this is, of course, a matter of fact on which we can form no opinion. If the house *has* been badly knocked about—paper torn, paint scraped, whitewash soiled, by careless and reckless misuse of the premises—then the wear is not reasonable, and the landlord is entitled to have the covenant fulfilled.

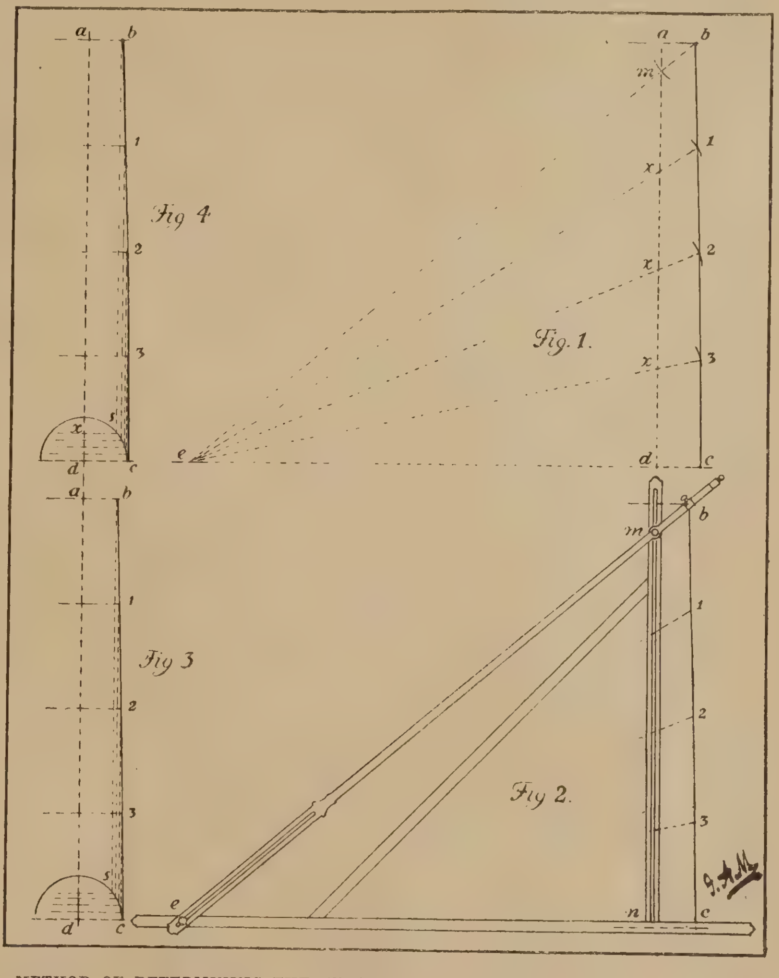
A. H.

DRAWING ENTASIS OF COLUMN.

ST. LEONARDS.—XYSTUS writes:—"Will you kindly tell me the best way to draw the swelling of the entasis of a Grecian column."

The following are some of the results arrived at by Mr. Penrose respecting the entasis of Greek columns as exemplified in the buildings on the Acropolis at Athens:—

(1) The amount of entasis seems to be no more than is required to correct the effects of the optical illusion. (2) The profile of column is never perpendicular at the base, but the curve begins at the stylobate, and is kept subordinate to the diminution. (3) The amount of entasis depended in some measure on the height of the column, and is found relatively less in smaller than in larger columns. In the shrine of Niké Apteros—where the columns are only 12ft. high—no entasis whatever has been detected. (4) In large columns, different in size, though of the same proportions, the amount of entasis has not been found to vary in quite the same ratio. (5) In every instance—Doric and Ionic—where an entasis has been found, the swelling is almost identical with the curve of a hyperbola whose "principal axis" is small, compared with the other lines employed. In the Parthenon the axes of the curve are horizontal and vertical, but in some other examples they are slightly inclined. The fact of the "principal axis" being the horizontal one gives a quicker curve to the entasis in the lower part of the column than in the upper. The curve of the hyperbola is more complex and refined than that of the other conic sections—the parabola, the ellipsis, or the circle—and it is not known how the Greeks set it out; it is not considered likely, however, that the Greek builders knew how to determine the "elements" of an hyperbola passing through certain points, and although the curve they produced bears a wonderful agreement with that of an hyperbola, it is probable the coincidence was incidental.



METHOD OF DETERMINING THE ENTASIS OF A COLUMN. BY J. A. MARSHALL.

A simple and satisfactory method of drawing the entasis for modern work is shown in the diagram (Fig. 1); *a d* is axis of column, *a b* half the upper, and *d c* half the lower diameter. From point *b* mark off half the lower diameter on the axis at *m*, and continue the line *b m* until it intersects the horizontal line at *e*. Divide the remainder of the axis, from *m* to *d*, into any number of parts, the more the better, but not necessarily equal; draw lines from *e* through the divisions *x x x*, and from these points mark off half the lower diameter on the lines at 1 2 3; these will be the points through which the curve of the entasis is to be drawn. It is sometimes considered desirable to make the contour of the column vertical for one third of the height from the base, the upper two-thirds being treated as just explained.

Fig. 2 shows how the curve can be described full size by means of a trammel. The movable limb *e b* (corresponding to line *e b*, Fig. 1) has a stud at *m* which slides in a vertical groove of the frame *e n m*, while a slot in the lower part of the limb slides on a fixed stud at *e*. By moving the limb down the vertical groove *m n* a pencil at *b* will mark the curve of the entasis through points 1 2 3.

Fig. 3 shows another method; draw a vertical line from necking at point *b* until it cuts the plan at *s*, divide the curve *s c* into a number of equal parts, and the height of column into the same number of equal parts, from the divisions *s c* on the plan draw vertical lines to the corresponding divisions on the elevation, and the points of intersection 1 2 3 give the entasis.

If the divisions *s c* are made equal on the axis, as at *d x*, Fig. 4, a slightly fuller entasis in the upper part of the column will be obtained. JOHN A. MARSHALL.

CHARGES FOR SEWERING AND PAVING.

HASLINGDEN.—H. writes:—"Will you kindly let me know (1) If a Town Council, as the urban authority, can charge a profit on materials used by them in the sewering, excavating, paving, flagging, &c., in streets to the respective owners of property, the work being done in pursuance of the Private Street Works Act, 1892. (2) Have they the power to add another sewer or anything else when this was not shown on their plans, nor given in their estimate or provisional apportionments? (3) Can they charge such addition and apportion the cost amongst the property owners in the streets without giving notice thereof? (4) Can they charge the cost for lowering the gas and water mains when such was not named in their original estimate? These mains were put in some years ago by the respective gas and water companies with the knowledge of the then surveyor of the Local Board, before the incorporation of the town."

(2) Under s. 11 of the Act, the urban authority may from time to time amend their specifications, plans, estimates, and provisional apportionments, but (3) if the expense is thereby increased the revised estimate, &c., must be published, and copies must be served upon the owners liable, so that objections to the proposed additional expenditure may be entertained and dealt with, as provided under ss. 3 and 7. (4) Under s. 9 (1) the urban authority may include any works which they think necessary to bring the street dealt with "as regards sewerage, drainage, or other matters" into conformity with any other streets; and it appears that gas and water mains may be included in such "other matters." But as regards the additional expense involved, due notice must be given, as stated (3) above.

G. H. B.

Views and Reviews.

LOCKWOOD'S PRICE BOOK.

The issue for 1900 of this excellent work has just made its appearance. The book has now become recognised as a standard work of reference, and is so well known that no extended notice of it is necessary. The present edition has been carefully revised, and the prices throughout have been altered and adjusted so as to bring them into harmony with the present state of the market. The prices err, if anything, on the right side, the prices for brickwork, for instance, being considerably over the present ruling prices. The memoranda throughout the volume are most useful, as are the careful annotations of the provisions of the London Building Act, 1894, by Mr. A. J. David, Ll.M., and also his notes of decisions in the courts, which have been brought down to date. A word of praise is due to the very full index, which is placed in the best position—the front of the book.

"Lockwood's Builder's, Architect's, Contractor's and Engineer's Price Book for 1900, with a supplement containing the London Building Act, 1894 and 1898, &c." Edited by Francis T. W. Miller, A.R.I.B.A. London: Crosby, Lockwood, and Son, 7, Stationers' Hall Court, Ludgate Hill. Price 4s.

THE THEORY OF COLOUR.

Mr. Hurst's book is entitled to rank among the manuals for which a place should be found on the shelves of those who, through need or inclination, concern themselves about Colour. It is exact, clearly reasoned, and deals in a sufficiently ample way with colour problems and the mechanism and physiology of colour sensation. The most accepted and probable theories are presented in a simple, concise, and accurate form, as well as the data afforded by recent experiment. The diagrams—more particularly those printed in colours — are effective, fulfil their purpose, and are properly placed in the text.

We think Mr. Hurst has justified his book, and by comparison with the current manual of this type we should say he is entitled to claim more than he has done in the modest preface in which his intents are set forth.

To discuss at any length the problems contained in his pages, or pronounce on the validity of the theories, would lead us far beyond the limit we have to assign for the criticism of purely scientific works, and would be out of our sphere. We are at one with the author in his method. He has no axe to grind, and we get facts, experiments, and theories set down in a simple, clear, and unprejudiced manner.

If, then, he had confined his labours to the exposition of the mechanical laws and physiological bases of colour sensation, we should have had nothing but praise for his efforts; but he has been tempted in the closing chapters into pronouncements on the æsthetics of his subject. Mr. Hurst does not show in these excursions the sound judgment which distinguishes his method in dealing with purely scientific issues, nor the natural gift which is absolutely the one thing needful.

The chaff, however, can be so easily separated from the wheat in his really useful contribution to popular science that its value is but little prejudiced thereby.

A mischievous Fate would seem to be always at hand to allure to indiscretion the writers of scientific works on Colour. From Chevreul to the later essays they have all done their best to deserve the neglect with which artists regard the literature of the subject when it comes in scientific guise, and this, we believe, not for any lack of appreciation on their part, or sympathy with scientific thought, but from causes for which the authors themselves are alone accountable. Setting on one side the specialist, the liberal general reader finds much in them to quicken his interest and to extend his horizon; but to the artist the introduction of more than questionable pronouncements on the æsthetics of colour makes for nothing but unkind mirth or justifiable resentment.

Some red-letter day, possibly, among the chances that give and preserve for us immature Turners or Faradays, enough space will be left in the brain-pan of a pre-destined light of science for the habitation of a good natural sense of colour. It is asking much from Fate, but it is fairly within the limits of the possible. Until then we must wait for the book on Colour.

All this is very delicate ground. It is only natural we should be slow to convince ourselves of shortcomings in the inborn faculties. The possession of a musical ear or a just eye for colour is courteously presumed to be the heritage of all respectable people. It goes upon the same lines as the polite fiction dear to all, that we are born able to manœuvre an army or a fleet, direct a cabinet, or play Hamlet, and probably does very little more harm than any of these pillars of belief. No one fiddles a bit the worse for the most accurate exposition of the laws of harmony in sound. A good colourist may be left chaperonless with his colour box without any fear of the demoralising effect of all the amusing excursions of writers on the harmony of colour, from Chevreul to the present one.

It would be unkind to Mr. Hurst and his good book to select any special propositions as a mark for the scoffers of the studios. We cordially recommend the work for its many real merits. If it should come to a second edition, and we think it certainly deserves more than that, we would advise the author either to carefully prune away the æsthetical or collaborate over friendly pipes with a good painter and colourist. They are not dangerous if properly handled. Mr. Hurst may lay this flattering unction to his soul, he has not sinned nearly so unforgivably as his forbears —especially Chevreul.

F. M.

"Colour." By George H. Hurst, F.C.S. London: Scott, Greenwood and Co., 19, Ludgate Hill, E.C. Price 7s. 6d.

At St. Andrew's Presbyterian Church, Eastbourne, a new organ has been built by Messrs. Bryceson Brothers, of London, at a cost of about £2,000. It is 29ft. high, 20ft. wide and 9ft. 6in. deep.

A New Artificial Pavement that has been adopted in Germany is made by mixing coal-tar with sulphur and warming thoroughly, adding chlorate of lime to the resulting semi-liquid mass. After cooling, the mass is broken into small pieces and mixed with glass or blast furnace glass-slag, the whole being reduced to a powder, which is then subjected to a pressure of 200 atmospheres, and then shaped to the form required. The resistance of this artificial pavement to wear and tear is fully half as great as granite, thus being equal in durability to many stone roads, while its cost is said to be greatly below that of any other form of paving material.

Under Discussion.

FRESH AIR IN ROOMS.

The subject of ventilation was also dealt with by Mr. Isaac Low at the last meeting of the Architectural Section of the Philosophical Society of Glasgow. The object of his paper, he said, was to tell how to make and keep the air in a room sweet and wholesome. Ventilation was the removal of foul air from a place and supplying pure air in its stead, and that might be accomplished by extracting the vitiated air and allowing pure air to take its place, or by forcing in pure air and affording proper opportunities for the exit of foul air, or by a combination of both systems. We required to admit 3,000 cubic feet of fresh air per hour for every person in an apartment. The size of the apartment made practically no difference in the amount of air that it was necessary to admit, unless the occupation by the person was to be made for a very short time; but the size of the apartment, compared with the number occupying it, made a very great difference in the difficulty in supplying the amount of air required without annoying the occupants. Ventilation should be carried out in such a manner that none in the place ventilated should feel any movement of the air, or in any way be made conscious that a system of ventilation was working. That was where their difficulty came in. It had been found that there was an increase in the healthiness and a decrease in the mortality of soldiers by increasing the area of accommodation in barracks to the present standard of 600 cubic feet. No ventilator or system was suitable for every case. Each case must be studied by itself. The two methods of mechanical ventilation were plenum, or propulsion, and the exhaust. He favoured the former method, for with it they could more easily treat the air they admitted. In hospitals which were constantly occupied the organic matter got pressed into the walls by the constant current of air being from the inside outwards. In the exhaust system the current would tend to keep the pores of the walls free from organic matter by always having a negative pressure on the inside. It was not the air they wished to get rid of, but the organic matter that it contained. In a perfectly still atmosphere it would come to the ground or floor lovel, but a perfectly still atmosphere did not exist in a well-ventilated room. That being so, he thought it was only reasonable that they should extract the air from near the ceiling.

VENTILATION WITHOUT DRAUGHTS.

Mr. Arthur Rigg's paper on Wednesday last at the Society of Arts on "Ventilation without Draughts" was distinctly timely. The Houses of Parliament (especially the smoking room), London theatres (all of them), the Academy, railway carriages, the Metropolitan Underground Railway, the new electric railways, the Law Courts, and the theatre of London University all came under the ban of Mr. Rigg as examples of the way in which ventilation ought not to be done; and the only public places selected by him for approval were the lecture theatre of the Society of Arts, and, in a modified sense, the Royal Institution. The reason for this multiplication of failures appeared to be that there are two or three distinct systems of ventilation, which each have their merits, but which, by a perversity of Fate or the builder, are always applied to the wrong places. For instance, the most common form of ventilation, and the one which most commends itself to the public mind, is to allow the hot air to escape at the top of the room and the cold air to filter in from below. But this method has proved a disastrous failure in the House of Lords, and it affords many brilliant opportunities to the insidious and watchful draught, because it creates violent and rapid currents of cold air at points and in places where the warmer air of the room has not time to mix with the newcomer. Hence the draught and the stiff neck. Lord Kelvin's committee at Glasgow adopted a different plan for the new University buildings.

The foul air was removed from below. Inlets for fresh air were fixed high up and distributed round the circumference of the room. Provision was made for forcing in a given supply of fresh air. But novel methods like these, if put in the wrong place, may prove faulty, as, for instance, at the United Service Institution, where no square foot of the theatre is left untraversed by cross currents, and where the cold air coming in from above falls by the force of gravity on the head of general and subaltern alike. The system which Mr Rigg pins his faith to is one in which a regulated quantity of fresh air should be allowed to enter the room at a level about one-third to one-half of the height of the room, and that the air thus entering should be assisted in the process of mixing gradually and naturally with the warmer air of the room by means of a rotating fan. Summing up his paper, Mr. Rigg laid down the following rules:—(1) Ventilation should, as far as possible, be carried out by the plenum and not by the vacuum system; that is to say, by forcing fresh air into a room rather than by drawing air out. (2) Fresh air should be introduced as an upward current from openings above the heads of an audience, but not so high as the ceiling. It should be driven in divided streams into the upper part of the room, so as to mix with warm air already travelling there. (3) Exits for carbonic acid, dust, and watery vapour should be provided at or near to the floor level, if required. (4) The roof or ceiling of a properly ventilated chamber should be hermetically closed. (5) Open windows should only be used during warm weather, never in winter. (6) As natural draughts, cannot always be relied upon, fans, or a furnace, or other means of producing artificial draughts should be resorted to when necessary.

New Patents.

These patents are open to opposition until February 27th.

1898.—Gullies.—20,025. W. Durrant, Felixstowe. Just below the grating is supported a removable funnel, the lower end of which enters an iron bucket in the gully extending below the level of the bucket overflow. At the bottom of the bucket there is a non-return disc valve. The solids fall on this bottom, the light materials float on the water or liquid at the bottom of the funnel, and the comparatively clear water passes out between the funnel and the bucket into the body of the gully and thence into the drain. The idea is to prevent clogging.

Stone Sawing Machinery. — 27,567. J. T. Pearson, Burnley. The circular saw shaft is mounted on a massive base, and the end carrying the saw projects some distance. Below it is a truck on which the block of stone is supported clear. This truck is moved forward by bevel gearing, according to the cut. The saw may have slots, instead of holes, in which the diamond holders are secured. Hand regulating mechanism is provided.

1899.—Closing and Opening Windows.—1,059. H. C. Pruce, Birmingham. The windows are opened by pneumatic or hydraulic means. Each is connected by a system of levers with a vertical piston rod that enters a cylinder at each end. By turning a cock the necessary pressure is admitted, and, according to the cylinder which receives it, the windows open or shut. The invention is applicable to all kinds of windows, shutters, and analogous fittings, which can be held in any intermediate position.

Burning Acetylene Gas.—4,365. J. R. Wigham, Dublin. One of the objections to acetylene gas is that it must either burn full cock or be turned out altogether, as, when turned down the consumption of the carbon is not complete, and smell and smoke result. To obviate this a high pressure needle-hole jet is fixed at the side of each burner. This acts like a by-pass.

Door Hinges.—5,944. C. Rothkegel, Germany. The working surfaces of the hinges are cut in the form of a spiral, and contain a race for balls. The friction is thus greatly reduced, and the door, by reason of the form of the hinges, closes automatically.

The following specifications were published on Saturday last, and are open to opposition until March 6th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1898.—20,645, Maussner, fire and water proof material and method and apparatus for producing it. 27,380, Phillips, machines for making window stile pockets. 27,416, Clay, incandescent gas burners.

1899.—1,411, Le Blanc, apparatus for treating street sweepings and scrapings and town refuse generally. 2,672, Pitkin and Thompson, machines for making expanded metal work. 3,077, Ingham, means or methods of ventilating chimney pots, chimney stacks, and buildings. 3,259, Boyce, chimney pots. 3,426, Brown, joint for pipes constructed on the spigot and socket principle. 3,555, Automatic Universal Gaslighter, Ltd. (*Elsbach and Pollini*), manufacture and mounting of devices for automatically igniting combustible gas. 3,599, B. Mountain and Son, Ltd., and Armistead, machinery for making nails and rivets. 3,796, Anderson, stone sawing machinery. 4,124, Dowsing, electric stoves. 4,194, Wadsworth, dust carts. 4,211, Markham, handles for hatchets, butchers' cleavers, adzes, hammers, and other tools with similar striking action. 4,427, von Kosinski, apparatus for drying newly erected buildings. 4,460, Whittaker and Bryant, filters or like appliances for use in treating or purifying sewage. 4,560, Haws (*Haws*), acetylene gas lamps. 13,556, Perlich, self-igniting gas burner. 14,795, Snyder and West, acetylene gas lamps. 18,048, Knowles (*Krafft and Schüll*), machine for making wire lath supports for venetian blinds, &c. 20,753, Biheller, lanterns or globes chiefly for incandescent gaslights, arc electric lights, &c. 20,929, de Bruyn, artificial building blocks. 20,936, Meiz, manufacture of plain and ornamental or decorated ceramic ware, and moulded articles, panels, cornices, &c. 22,088, British Thomson - Houston Co., Ltd. (*Steinmetz*), incandescent electric lamps. 22,516, Stern, regulated liquid trap for the gas delivery pipes of acetylene gas generators. 22,527, Thompson (*Gebrüder, Buxbaum*), apparatus for carburetting air, or producing "air-gas." 22,714, Straub, plaster, cement and the like. 23,285, British Thomson-Houston Co., Ltd. (*Rice*), electric arc lamps. 23,288, British Thomson-Houston Co., Ltd. (*Wiswell*), inclosed electric arc lamps. 23,502, Jenner, apparatus for raising water and converting it into available power. 23,732, Murphy and Arnold, gas valves or stop cocks. 23,845 Fromholt, means and apparatus for sawing stone or other hard substances.

New Infant Schools at Barry have been built by Mr. Alban Richards, of Barry Dock. They will be formally opened shortly.

The Marquis of Lothian died on Wednesday last. Amongst other offices held by him was the presidency of the Society of Antiquaries. Newbattle Abbey, the picturesque seat of the family, near Edinburgh, is famous for its fine pictures and valuable library, and its interest for antiquarians lies mainly in the fact that the mansion is built on the actual site, and out of the very stones, of the famous Cistercian Abbey.

Artists' War Fund.—The Corporation of London is defraying all expenses in respect of the exhibition at the Guildhall Art Gallery, initiated by the president and members of the Royal Academy in aid of the wives and children of the men now serving in South Africa. Messrs. Clowes and Sons are presenting the catalogue; and the workmen of Messrs. Dicksee and Co., the agents and carriers, have volunteered to work overtime for the exhibition, without payment, as their contribution to the fund.

New Companies.

South Glasgow Property Corporation, Limited.

This company has been registered in Scotland with a capital of £70,000 in £1 shares (35,000 five per cent. cumulative preference), to adopt an agreement with William Hill, 141, West George Street, Glasgow, and to carry on the business of builders, feuars, &c. Registered offices: Baltic Chambers, 50, Wellington Street, Glasgow.

Canney Brick Company, Limited.

This company was registered on January 5th by Withers and Co., 6, Arundel Street, Strand, with a capital of £50,000 in £1 shares, to construct and maintain public works of every description; to undertake and carry out all kinds of reclamation and sanitary works; as timber merchants, sawmillers and sawmill proprietors; as colliery proprietors, coal merchants, &c.; as quarry owners and stone merchants, manufacturers of and dealers in building materials of every description; brick and tile makers, &c. The first directors (of whom there shall be not less than two nor more than five) are A. Mayhew, J. Douglas and J. Barker. Qualification, £250. Remuneration to be fixed by the company.

Stone and Co., Limited.

This company was registered on January 6th by P. le Brun, 30, Plough Road, Rotherhithe, with a capital of £37,000 in £20 shares, to acquire the business now carried on as Stone and Co., Limited (incorporated in 1884), and to carry on the business of brickmakers, merchants, and manufacturers of building materials, &c.

Borough-Green Brickfields, Limited.

This company was registered on January 8th by E. S. Parker, Finsbury House, Blomfield Street, E.C., with a capital of £2,500 in £1 shares, to acquire the business at Borough Green, Kent, by H. J. Lee, and to carry on the business of brick, tile, and pipe manufacturers, &c. The first directors (to number not less than two nor more than five) are H. P. Monckton (chairman) and H. J. Lee (managing director). Remuneration as fixed by the company. Registered office: 32, Walbrook, E.C.

St. John's Estates (Wakefield), Limited.

This company was registered on January 9th by Waterlow and Sons, Limited, London Wall, E.C., with a capital of £10,000 in £5 shares, to acquire the St. John's Estate, Wakefield, and to carry on the business of land and property owners, builders, decorators, contractors, &c. The first directors (to number not less than four nor more than seven) are to be appointed by the subscribers. Qualification, £200. Remuneration as fixed by the company.

West Barnham Estate Company, Limited.

This company was registered on January 10th by Charles and Read, 7, Quality Court, W.C., with a capital of £5,000 in £1 shares, to adopt an agreement with S. S. Marshall, Limited, and the West Barnham Estate, Limited, and to acquire and deal with any land and buildings. The first directors (to number not less than two nor more than seven) are S. S. Marshall, W. W. Pertwee, J. P. Goodacre and C. Stride. Qualification, £55. Remuneration as fixed by the company.

Rotherham Estates Company, Limited.

This company was registered on January 11th by Pashley and Hodgkinson, Rotherham, with a capital of £5,000 in £1 shares, to acquire a freehold building estate at Rotherham, Yorkshire, and to carry on the business of builders, brickmakers, coal and iron masters, stone merchants, &c. The first directors (to number not less than three nor more than five) are E. Hutchinson, G. Williams, M. R. Davies, G. Gummer and J. B. Jenkinson, Qualification, 30 shares. Remuneration as fixed by the company.

Professional Practice.

Aberdeen.—In the Aberdeen Small Debt Court on Thursday last a mason named William Buchan sued James E. Strachan, of Aberdeen, for £3 3s., being repayment of an account incurred to Mr. William Ruxton, architect, for preparing plans, &c., in connection with alterations at and additions to defendant's factory in Back Wynd. The claim was resisted on the ground that the defendant never instructed Mr. Ruxton, and that he had paid the contractor all expenses connected with the work. From the evidence it appeared that the Town Council would not allow the work to be gone on with till plans were prepared and passed, and the plaintiff went to Mr. Ruxton, the nearest architect, to get that done. Mr. Strachan saw him often and consulted with him as to the plans, and Mr. D. T. Byres, C.E., from the borough surveyor's office, deposed that the plans were in the name of the defendant. In giving judgment, Sheriff Burnet held that Mr. Buchan, in employing an architect, acted as agent for Mr. Strachan, whose duty it was to supply plans. These were necessary to let the work proceed. Defendant consulted about them, got the benefit of them, and must pay for them. He gave decree for the amount, with expenses.

Birmingham.—Two new blocks of buildings are being erected in Broad Street. The first block for the London City and Midland Banking Company, is at the corner of Hagley Road and Ladywood Road. The building, designed by Mr. W. Hale, architect, Colmore Row, is in the Renaissance style, the lower portion being executed in red terra-cotta, and the upper portion in buff terra-cotta while the flat wall spaces alone are in red brick. The block is four storeys in height, with a frontage of 80ft. to Ladywood Road and 57ft. to Hagley Road. The elevation is 37ft. to the top of the cornice, from which rises a steep mansard roof containing several dormer windows, while the corner is emphasised by a turret rising to a height of 65ft. from the pavement. Two shops are provided in Hagley Road, the bank occupying the whole of the frontage in Ladywood Road and about 23ft. on the Hagley Road side. The total cost of the building is about £7,000. Lower down Broad Street, at the corner of Sheepcote Street, branch premises have been built for the Birmingham District and Counties Bank. The frontage to Broad Street, including the porch, is 70ft., and to Sheepcote Street 75ft., while the elevation from the pavement is 55ft. The style of the building, designed by Messrs. Bateman and Bateman, of Edmund Street, is English Renaissance. The lower portion is constructed in Hollington stone and the upper part in Leicestershire red brick with stone dressings, the roof being covered with Clynderwyn slates. A feature of the roof architecture is the effective grouping of the chimneys. The public room of the bank on the ground floor is entered through a richly carved stone porch, and the apartments above have been fitted up as a manager's residence. The block of buildings is four storeys in height and its construction involves an expenditure of between £5,000 and £6,000. In addition to these two, other branch banks are in course of erection in Birmingham. For the London City and Midland Bank, Mr. D. Arkell, of Temple Row West, has designed a building in Coventry Road, at the corner of Regent's Park Road. It is classical in style and built of Hollington stone, with half-lead mansard roof, the gable being so arranged as to allow a large clock to be inserted. The building is three storeys in height, with a frontage to each road of 47ft. and an elevation of 43ft. from the pavement. The banking room is on the ground floor, and the rooms above will be let as offices. The cost of the building is estimated at about £10,000. Lloyd's Bank are concerned in the erection of two new branch banks, while two others are undergoing enlargement. The work is being carried out in accordance with the designs of Messrs. J. A. Chatwin and Son, of Colmore Row. The old bank at the corner of Great Hampton Street and Harford Street has been pulled down, and a new one is being built entirely of buff terra-cotta, at an estimated cost of about £7,000. The height of the four-storey building is 50ft., and the frontage to Harford Street is 60ft. and to Great Hampton Street 40ft. The other new bank is being erected on a site at the corner of Monument Road and Beach Street. The building is of brick with terra-cotta dressings, and the height is about 35ft., with a frontage of 50ft. to each of the two roads. The bank at the corner of Stratford Road and Braithwaite Road, Sparkbrook, has been considerably enlarged by the addition of the adjoining house. The upper floors remain, but the ground floor has been reconstructed in Hollington stone and there is now a frontage of 53ft. to Stratford Road and 55ft. to Braithwaite Road. A similar extension has been made to the bank on the Coventry Road, at the corner of Cyril Road, the frontages having been increased to 51ft. in the former road and to 40ft. in the latter.

Bradford.—The elaborate works of decoration which have been in progress for nearly two years past in St. Clement's Church, Barkerend Road, Bradford, have now been completed. When the church was originally built, six years ago, the interior was given an air of distinction by the elaborate moulded and coloured ceiling of fibrous plaster which was put up in the chancel from designs by Mr. G. J. Frampton, A.R.A. This scheme of decoration has been carried throughout under the direction of Mr. W. M. Palin, of London, who conducted one of the biggest schemes of decoration in the country after that of St. Paul's Cathedral—namely, at the McEwan Hall of the Edinburgh University. With the distinctly French character which belongs to the architecture of the building and the "waggon-head" ceilings, comparatively uncommon in England, the church has somewhat of a Continental air. In the chancel Mr. Palin has painted two large frescoes, representing the "Adoration of the Magi" and the Crucifixion. The pictures being 12ft. in height by 9ft. in width, it has been possible to represent the figures life size. Apart from these pictures the walls of the chancel are decorated. The walls of the nave above the aisle arcades have received painted ornaments, and the spandrels are filled with angels holding musical instruments, the latter being executed in relief in coloured and moulded plaster. The wall over the chancel arch is also decorated in a somewhat similar manner, with angels holding a ribbon upon which is the word "Hallelujah." The walls of the aisles have received equally elaborate treatment though in rather a different manner. Between each window the wall has been divided into panels, in each of which appears a conventionalised tree representing the "Tree of Life" rising amid lilies, and on a ribbon various texts are inscribed.

Cardiff.—The Cardiff Intermediate School for Girls is now housed in a new building, which has been built in the Parade at a cost of nearly £30,000. Mr. George Thomas, F.S.I., of Cardiff, is the architect. On the ground floor there is an assembly hall 67ft. by 35ft., connected with corridors to both the new and old schools. On the same floor there are four classrooms, teachers' rooms, and waiting room. On the first floor are four classrooms, music room, and teachers' room; and on the second floor a lecture theatre, a cookery kitchen, studio, science room, and a library are provided. In the basement are a dining hall, kitchen, scullery, &c., a gymnasium, hat and cloak rooms, and lavatories. The new buildings provide classroom accommodation for 252 pupils, and the old school has accommodation for 183 pupils, making a total of 435. The front facing the Parade and the assembly hall are designed after the style of the earlier English Renaissance. The Parade front is executed in Portland stone, and the assembly hall in red brick and Portland stone. The interior of the assembly hall is faced with red brick and Bath stone, and has a panelled dado round it and an open timber roof. The new buildings are lit by the electric light, and heating is by hot water, except in the classrooms, which have Manchester grates. The contractors were Messrs. Lattey and Co.

Edinburgh.—In common with other city congregations in Edinburgh, that of St. Stephen's Free Church, Wemyss Place, has long had under consideration the advisability of transferring the sphere of its labours to one or other of the more populous suburbs. About twelve months ago the move was decided upon, and, after careful deliberation, a site at the east corner of Comely Bank Road and Fettes Avenue (which was at that time occupied by a temporary church) was selected and duly secured. Competitive designs were asked for from a number of Edinburgh and Glasgow architects, and, as a result, that by Messrs. J. N. Scott and A. Lorne Campbell, of 44, Queen Street, Edinburgh, was selected. The site is of considerable area and open, and the plans, for which warrant was granted by the Dean of Guild Court last week, show, in addition to the church proper, a large hall, with retiring and lavatory accommodation attached, while provision is also made for the ultimate erection of a manse. Designed in the later Gothic style, the church has its entrance frontage towards Comely Bank Road, and at the same time presents a picturesque elevation to Fettes Avenue, which at some future time will be still further enhanced by the erection of a lofty square tower, the base of which only is to be erected at present. The plan of the church consists of a nave, with side aisles, transepts and choir. The aisle arcade is lofty, and has a clerestory over, while the choir, the floor of which is raised somewhat above the level of the nave, is also defined by a handsome arch. The tower is situated at the angle formed by the west transept and the nave and the hall immediately behind the choir. The church, which is designed to seat 750 persons, is expected to cost somewhat over £7,000. It is intended to make an immediate start with the building.

Hawkhurst.—At Ticehurst, near Hawkhurst, Sussex, there has been erected, from designs by Mr. Aston Webb, a parish institute, with reading room, games room, billiard room, lavatories, a large entertainment hall, with stage, green room and lavatories, and an ample caretaker's residence of six rooms, with outhouses. The building stands on the high road about three hundred yards from the church, and looks southwards over a recreation ground laid out for football and cricket, with a playground for children annexed. Red brick has been used, and there are some handsome doorways and windows with facings of Bath stone. The doors of the three main entrances are of finely-carved oak, the woodwork of the interior being chiefly of Oregon pine. Gas and electric bells are provided, and the whole building is warmed with hot water coils, though there are cheerful fires as well in the reading and games rooms.

Neath.—The new Board schools comprise two separate blocks, one for boys and girls and the other for infants. The school accommodates 300 boys, 300 girls, and 350 infants, making a total of 950 children. The boys' and girls' school forms the main block, and faces Gnoll Park Road, consisting of a central hall 81ft. by 35ft. surrounded by ten classrooms. On the first floor there are art and cookery rooms and scullery, together with headmaster's and headmistress's rooms, with lavatories. The infants' block comprises a large marching space or assembly hall, with six classrooms and cloak rooms. On the first floor there is a large board room and also mistress's and teachers' rooms, with lavatories conveniently arranged. The rooms are heated by open grates and Musgrave's hot water small-pipe system. The classrooms and hall have pitch pine wood block flooring, and matchboarded dados are arranged for all the rooms. The front elevations are faced with local stone relieved with Bath stone dressings, pediments, coping to gables, &c.; and there are large playgrounds at the back of the school with covered portions, and latrines to each department.

The total area of the site is two acres, and is enclosed by a boundary wall with palisading wall and railing to front and sides. Mr. J. Cook Rees, of Neath, was the architect, and Mr. D. Jenkins, of Swansea, the contractor. The cost has been £10,700.

Norwich.—Shotesham Parish Church has been restored at a cost of about £2,300, under the direction of Mr. W. S. Hicks, architect, of Newcastle-on-Tyne. A new oak roof, new seats, finely-carved oak screens to the chancel and two transept arches, a carved stone pulpit, and a carved stone reredos have been provided. A carved altar and credence table, new prayer desks and sedilia, new brass eagle lectern, new glazing to all the windows (copied from the windows in Milan Cathedral), the substitution of an organ for a harmonium, paving the sanctuary, baptistry, and all aisles with marble paving of various colours, forming baptistry and opening out of tower, erection of new oak screen to baptistry, building of a new vestry, heating the church with hot water, new concrete floor to the entire church, new large window in nave, restoration of tower and porches, making good the walls, panelling chancel walls with oak, new chancel ceiling, new embroidered sanctuary hangings, construction of ringing chamber in the tower, new spiral staircase to tower, repairing all the old stonework in windows, undersetting the walls of tower, and forming concrete trenches round the church—this completes the list of improvements effected. The stone carving was done by Mr. Milburn, of York, the wood carving by Messrs. J. Howard and Sons, of Norwich, the windows by Messrs. Reed and Millican, of Newcastle-on-Tyne, and the carpenter's work for the contractor by Mr. Hurn, of Norwich. Mr. Robert Webb, of Shotesham, was the general contractor. During the restoration several objects of antiquarian interest have been discovered, all of which have been carefully preserved. The most interesting is the stone eagle, which has been replaced in its original position on the sanctus bell gable; it bears the inscription "Veni Emmanuel." The frescoes are also of great interest. Three water stoups and steps leading to the rood loft were also discovered.

Keystones.

A new Congregational Chapel at Blackpool has been built in Alexandra Road, South Shore, from designs by Mr. Nuttal, at a cost of £4,500.

Additions to the Drill Hall, Dundee, have been made from designs by Mr. T. S. Robertson, architect. Three extra rooms for officers, an armoury, two halls, and a sergeants' room have been provided.

Two London Street Names that are to disappear.—The County Council propose to call the whole thoroughfare from Charing Cross to the Parliament Houses by the name of Whitehall, obliterating two historic streets—Parliament Street and King Street.

A new Board Room and Offices at West Hartlepool are being built in Hart Road for the Board of Guardians at a cost, including the site, of £6,000. Mr. Wilson, of West Hartlepool, is the architect, and Messrs. Gradon and Sons, of Durham, are the contractors.

Aberdeen Corporation Lodging House.—The cost of this building has been £11,800, which is about £1,000 in excess of the original estimate. Mr. Dick, of Newcastle, the architect, says that specially strong foundations had to be put in, whilst a considerable amount was spent on the heating apparatus.

A New Theatre at Harrogate, known as the Grand Opera House, has been built on a triangular site between Chapel Street and Cheltenham Parade. The predominating feature of the interior decorations is pure white, and the upholstery is in blue. There are two circles, constructed on the cantilever principle, and the electric light has been installed.

Building Etymology.—According to that high authority, the "Globe," the real origin of the word "brick" is the proud reply of a king to an invading enemy who mocked at his unwalled towns: "My troops are my walls," he answered, "and every soldier is a brick." As a term of endearment it is said to have its origin in the "wall red" undergraduate.

A Rowton House at Liverpool, called "Bevington House," has been built in Bevington Bush, near the west side of St. Martin's Market, Scotland Road, and comprises 500 cubicles, or sleeping apartments, 7ft. 6in. by 5ft., for which the nightly charge is 6d., which includes the use of the other resources of the house. The entire cost of the building is stated to be £25,000.

Forfar Parish Church was re-opened for public worship on Sunday last. For eighteen months it has been closed while the new organ, presented by Mr. James Duncan, was being erected by Messrs. Forster and Andrews, of Hull. Extensive structural alterations were also necessary. The decorations were executed by Messrs. Bowie, Fisher and Co., of Glasgow.

Newcastle Art Gallery: £20,000 Offered.—Mr. F. M. Laing, a rich licensed victualler in the city, has offered £20,000 for an art gallery at Newcastle, provided the public subscribe £8,000 for furnishing and equipment. His idea is to so enlarge upon the design of the public library as to accommodate lending, reference, reading, and all departments on the basement floors, leaving room on the upper floors for the picture galleries.

Additions to Dewsbury Technical School.—On Friday last a new wing to the technical school at Dewsbury was opened. It has cost nearly £6,000, and provides six classrooms, two physical laboratories, and new rooms for the dyeing and weaving departments, including a new loom room, which will be provided with looms of all the types in use in the district for worsted, woollen, cotton, and carpet weaving. Mr. J. Lane Fox was the architect of the building.

Britain and the Paris Exhibition.—Great Britain will be well represented at the Paris Exhibition; first, by a Royal pavilion, which will contain an art exhibition; secondly, by some buildings which have been erected in the Trocadero gardens for India and the British Colonies; thirdly, by several annexes which are to be devoted entirely to British exhibits. The Peninsular and Oriental Steamship Company are constructing a replica of the building they had at the London Naval Exhibition some years ago.

Collapse of a Building at Keighley.—On Friday last an enlargement to the foundry of Messrs. George Hattersley and Sons, Limited, loom makers, Keighley, which was in course of erection, was blown down by the wind, causing considerable damage. The structure was being built upon the wall of the foundry and the old boundary wall of adjoining vacant land, and the skeleton framework of wood and iron had been fixed. The length of the building was about 80ft. or 100ft., and the width about 40ft. It was fortunate that the mishap occurred while the workmen were away at dinner.

The General Staff of Messrs. Young and Marten, Limited, held their annual dniner recently at the new railway stores and siding at Maryland Point, Stratford, London, E. Each chief of department sat at the head of his assistants, and the whole was presided over by Mr. E. Montague Edwards (the managing director), supported by Mr. B. Carter (head of the paperhangings and gas fittings department). In replying to the toasts of "The Firm" and "The Chairman," Mr. Edwards referred to their new premises—which comprise a building having three floors 430ft. by 60ft., and three others 196ft. by 28ft.—and ventured to say that no firm of their kind possessed such stocking area. In addition to this warehouse they had acquired a wharf at Millwall, which gave them still further facilities. During the evening the kindly manner in which the firm treated their employées was alluded to, and received a hearty response.

The Ancient Church of Hengrave, in Suffolk, no portion of which was earlier than 1500, has been restored by Mr. John Wood, who purchased Hengrave Hall about two years ago. The architect was Mr. Herbert Green, of Norwich, and the contractors were Messrs. Cornish and Gaymer, of North Walsham.

COMING EVENTS.

Wednesday, January 24.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. John Castell-Evans, F.I.C., on "Natural Forces: Light, Heat, and Electricity." 8 p.m.

Northern Architectural Association.—Students' Evening.

Society of Arts.—Mr. Meade-King on "Local Government and its Relation to Parish Water Supply and Sewerage." 8 p.m.

Thursday, January 25.

Glasgow Institute of Architects.—General meeting at 2 p.m.

Society of Architects.—Mr. Alfred Roberts, M.S.A., on "The Designing of Electric Lighting Generating Stations." 8 p.m.

Institution of Electrical Engineers.—Meeting at 8 p.m.

Royal College of Art, South Kensington.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: The Lower Limb." 6.15 p.m.

Society of Antiquaries of London.—Meeting at 8.30 p.m.

Friday, January 2.

Architectural Association.—Mr. W. R. Lethaby on "Cast Iron." 7.30 p.m.

Glasgow and West of Scotland Technical College Architectural Craftsmen's Society.—Mr. David Skinner on "Notes on Builders' Lifting Appliances." 8 p.m.

Institution of Mechanical Engineers.—Annual Elections. Mr. William Schönheyder, M.I.M.E., on "Water Meters of the Present Day; with special reference to small flows and waste in dribbles." 8 p.m.

Royal College of Art, South Kensington.—Mr. Lewis F. Day on "Ornamental Design."—IV. 11.30 a.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. John Castell-Evans, F.I.C., on "The Atmosphere: Pressure and Composition." 8 p.m.

Birmingham Architectural Association.—Mr. Paul Waterhouse, F.R.I.B.A., on "A Corner of Old France." 6.45 p.m.

Society of Architects.—Meeting at the Athenæum, Bedford Circus, Exeter. Mr. Ellis Marsland on "The Statutory Registration of the Profession." 6.30 p.m.

Institution of Civil Engineers. (Students' Meeting.)—Mr. C. B. Fox on "The Simplon Tunnel." 8 p.m.

Saturday, January 27.

Dundee Institute of Architecture, Science and Art.—Mr. R. S. Douglas on "Greek and Gothic Abstraction from Natural Forms: A Comparison." 7 p.m.

Institution of Junior Engineers.—Fifteenth Anniversary Dinner at the Westminster Palace Hotel. 6.30 p.m.

People's Palace Architectural Society.—Visit to the New Railway, Mile End Road, at 2.30.

North of England Institute of Mining and Mechanical Engineers (Newcastle-upon-Tyne).—Council Meeting at 1.30 p.m.

Monday, January 29.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. Edward F. Willoughby, M.D., D.P.H., on "Elementary Statistics." 8 p.m.

Surveyors' Institution.—Ordinary General Meeting at 8 p.m.

Royal College of Art, South Kensington.—Mr. Hugh Stannus, F.R.I.B.A., on "The Historic Evolution of Applied Art: XII.—Mahometan Christian Art." 6 p.m.

Society of Arts.—(Cantor Lectures).—Mr. Bennett H. Brough on "Metalliferous Deposits."—II.

London Institution.—Mr. Walter Crane, A.R.W.S., on "The Elements of Linear Empression." 5 p.m.

Tuesday, January 30.

Society of Arts (Applied Art Section).—Mr. Cyril Davenport on "Niello Work." 8 p.m.

Wednesday, January 31.

Society of Arts.—Sir W. M. Conway on "The Undeveloped Resources of the Bolivian Andes." 8 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers).—Mr. John Castell-Evans, F.I.C., on "Air and Ventilation; Combustion and Respiration." 8 p.m.

Northern Architectural Association (Newcastle-upon-Tyne).—An Evening of Notes, by Mr. Jas. T. Cackett, F.R.I.B.A. 7.30 p.m.

British Archæological Association.—Meeting at 8 p.m.

Thursday, February 1.

Royal College of Art, South Kensington.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: The Lower Limb." 6.15 p.m.

Civil and Mechanical Engineers Society.—Mr. F. H. Hummel, A.M.I.C.E., on "Graphical Solutions of Certain Problems in Engineering." 8 p.m.

Society of Antiquaries of London.—Meeting at 8 p.m.

Friday, February 2.

Architectural Association.—(Discussion Section.)—Mr. G. M. Nicholson on "Opening-up Land for Building Purposes." 7 p.m.

Sanitary Institute.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. John Castell-Evans, F.I.C., on "Water—Composition, Pollution and Purification." 8.30 p.m

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Lewis F. Day, on "Ornamental Design." 11.30 p.m.

ROYAL INSTITUTION.—Mr. Marconi on "Wireless Telegraphy." 9 p.m.

Saturday, February 3.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Meeting at Carpenters' Hall at 6 p.m.

CURRENT PRICES.

FORAGE.

		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 0 0
Sainfoin mixture	do.	3 15 0	4 5 0
Clover, best	do.	4 5 0	5 0 0
Beans	per qr.	1 8 6	—
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 5 8	1 8 0
Colza Oil, English ...	per cwt.	1 7 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 11 0	—
Linseed Oil	per cwt.	1 3 9	1 3 10½
Petroleum, American ...	per gal.	0 0 7	0 0 7⅛
Do., Russian ...	per gal.	0 0 5 15/16	—6 1/16
Pitch	per barrel	0 8 6	—
Tallow, Town	per cwt.	1 6 0	1 9 0
Tar, Stockholm	per barrel	1 5 0	1 5 6
Turpentine	per cwt.	1 18 6	—
Lead, white, ground, carbonate	per cwt.	1 3 0	1 4 0
Do. red	per cwt.	1 0 4½	—
Soda crystals	per ton	2 17 6	3 0 0
Shellac, orange	per cwt.	3 3 6	—

METALS.

Copper, sheet, strong ...	per ton	82 0 0	—
Iron, bar, Staffs. in London	do.	10 0 0	11 0 0
Do. Galvanised Corrugated sheet ...	do.	15 0 0	—
Lead, pig, Spanish ...	do.	16 0 0	16 5 0
Do. do. English common brands	do.	16 10 0	—
Do. sheet, English, 6lb. per sq.ft. and upwards	do.	18 10 0	19 0 0
Do. pipe	do.	19 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	do.	9 15 0	10 15 0
Tin, Foreign	do.	121 0 0	121 10 0
Do. English ingots ...	do.	124 10 0	125 10 0
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	24 10 0	—
Do. Spelter	do.	21 0 0	21 5 0

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Do Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	per bundle.	0 1 4½	0 1 5
Deals, Archangel 2nd & 1st	per P. Std.	10 10 0	11 15 0
Do. do. 4th & 3rd.	do.	12 10 0	14 5 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	17 0 0	—
Do. do. 2nd ,,	do.	8 15 0	12 0 0
Do. do. Unsorted ,,	do.	10 15 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	10 0 0	15 10 0
Do. White Sea	do.	17 10 0	18 0 0
Do. Quebec Pine, 1st...	do.	19 5 0	24 10 0
Do. do. 2nd	do.	16 10 0	—
Do. do. 3rd &c.	do.	8 10 0	9 15 0
Do. Canadian Spruce, 1st	per P. Std.	9 15 0	11 0 0
Do. do. 3rd & 2nd	do.	9 5 0	9 10 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	7 15 0	10 0 0
Flooring Boards, 1 in. prepared, 1st	per square	0 10 3	0 10 6
Do. 2nd...	do.	0 8 9	0 9 6
Do 3rd &c.	do.	0 8 0	—

HARD WOODS.

Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4½	—
Do. Honduras	do.	0 0 4 3/16	—
Do. Tobasco	do.	0 0 4½	—
Elm, Quebec	per load	12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 5 5/16	—
Do. African ...	do.	0 0 4 13/32	—
Do. St. Domingo ...	do.	0 0 3¾	—
Do. Tobasco ...	do.	0 0 6	0 0 7⅛
Do. Cuba ...	do.	0 0 7 29/32	—
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	10 0	16 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown ...	do.	3 15 0	5 15 0
Walnut, American ...	per cub.ft.	0 9	0 3 5

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

CRADLEY.—For the erection of Baptist Church. Mr. A. T. Butler, architect, Cradley Heath. Quantities by the architect :—

		Allowance for old Materials.
C. A. Horton	£4,044 0 0	—
John Dallow	3,974 0 0	£45 0 0
A. and S. T. Bishop	3,957 0 0	—
Roberts and Son	3,940 0 0	50 0 5
Brooks and Tandy	3,735 0 0	—
C. Griffiths	3,710 0 0	40 0 0
W. Willetts	3,543 0 0	—
J. M. Tate	3,600 0 0	150 0 0
J. A. Meredith	3,599 2 7	150 0 0
H. Dorse, Cradley Heath*	3,250 0 0	70 0 0

*Accepted.

FELIXSTOWE.—For the erection of a pair of semi-detached houses in Bath-road, for Mrs. Dreaper. Mr. Henry W. Buxton, architect, Lorne-buildings, Felixstowe :—

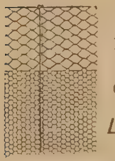
Thurman	£1,897 0 0	Ward	£1,793 0 0
Linzell	1,850 0 0	Pratt*	1,598 18 6

[All of Felixstowe.] * Accepted.

FELIXSTOWE.—For the erection of a pair of semi-detached houses in Beach-road, for Mr. A. W. Franklin. Mr. Henry W. Buxton, architect, Lorne-buildings, Felixstowe. Quantities by the architect :—

Thurman...	£2,643	Linzell	£2,355
Banyard	2,500	Ward	2,340
Hipwell	2,396	Pratt	2,301
West	2,394		

COMBINED MESH NETTING.



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SYSTEMS OF SEWERAGE.

At the present time considerable attention and interest is being paid to various systems for the disposal of sewage, each of which has its own advocates and supporters.

Respecting chemical precipitation, Mr. Dibden says: "The results of numerous experiments made by myself on both large and small quantities of sewage liquid have fully demonstrated the fact that the use of an excessive quantity of lime, while affording a rapid settlement of the sludge and a more or less clear effluent, dissolves a by no means inconsiderable quantity of the offensive matter previously in suspension, and this is apt to render the last state of the liquid worse than the first." Of precipitation, Dr. Tidy, in a paper read before the Society of Arts, says: "It is not adequate to produce an effluent of a high degree of purity; where such an effluent is required, it can only be obtained after the sewage has been filtered, under proper conditions, through land on which vegetation is growing." This brings us to a consideration of the sewage farm. Sewage must not stagnate on the land; therefore the land must be carefully gradated into levels. The sewage must pass through, not over, the land; therefore the farm must be carefully underdrained. The process works well at Rugby and at Merthyr Tydfil. Edinburgh has for two hundred years obtained great advantages by the irrigation of the Craigentinny meadows with liquid refuse of the city. Paris, also, has treated a small portion of its sewage in this way, on the plains of Gernevilliers. But of continental examples the most important are Berlin, Danzig, Breslau, and Milan. In the latter city the liquid refuse is collected in large sewers which join one another in a canal called the Vettabbia, which carries the refuse on to about 4,000 acres of land, whence, descending from level to level, it falls into the river Lambro ten miles below the city. It is calculated that to each acre is applied the liquid refuse of about forty persons.

The two kinds of bacteria which destroy refuse, or dead organic matter, are named *aërobic* and *anaërobic*. The former is the agent of and destroys by decomposition; the latter is the agent of and destroys by putrifaction. The *aërobic* is so called because it can work only in the open air. The *anaërobic* receives its name from the fact that it requires little or no air, and is the agent which for centuries has done its work unknown in cesspools. Owing to its labours being carried on in the absence of air, the elements often recombine and form other dangerous compounds, hence the work of the oxidising *aërobic* bacteria is much to be preferred. Miguel estimated that in a gramme of soil at Montsouris there were 750,000 germs; and in the Rue de Monge 2,100,000. Therefore, if sewage be spread over the surface of the soil, freely exposed to the atmosphere, it will be attacked by the bacteria of decomposition, the elements will be oxidised and reduced to mineral form, and the purified water will percolate into the earth, to reappear elsewhere as springs. As the water disappears the air will follow it into the pores of the earth, so that any decomposable matter lodged in them will be attacked and destroyed. If sufficient intervals of rest are given to the piece of ground it will continue to receive and purify indefinitely. This, then, is the sewage-farm broad irrigation system

Experiments with tanks were first carried out in Massachusetts in 1887; these experiments continued intermittently until 1891; then in 1894, Colonel Waring, the experienced American sanitary engineer, erected plant on a practical working scale in Newport, R.I., where the bacterial theory was applied to a filter-bed by artifically supplying a forced air-pressure for the stimulation and sustenance of the bacteria. The sewage was pumped from the main outfall sewer of the city and contained not only fresh waste, but the putrid overflow of many cesspools; yet the results were above the most sanguine expectations. The liquid on leaving the tanks was clear, white, odourless and tasteless. It was collected in a large tank where discolouration would have been at once apparent, and in this tank fish lived and thrived. Colonel Waring states that the engineers and committee drank of it freely and pronounced it good; and frequent chemical analysis proved it to be good drinking water. An average of the figures representing the purification accomplished showed that 92·5 per cent. of the organic matter was removed, and at one time a removal of 99 03 per cent. was effected.

Soon after this experiment Englishmen turned their attention to the matter, with the result that up to the present time six filters at least have been patented, some having intermittent action and some continuous action. They are Scott-Moncrieff's filter, Ducat's filter, Lowcock's filter, with continuous action and with intermittent action, Dibden's "bacteria tank," Cameron's "septic tank," and Garfield's coal filters, patented by Mr. Garfield, engineer of the Wolverhampton Sewage Outfall Works. Dibden's "bacteria tank" is used at Sutton Sewage Works, Surrey; and Cameron's "septic tanks" are in use at both Yeovil and Exeter.

BIRMINGHAM DRAINAGE SCHEME.

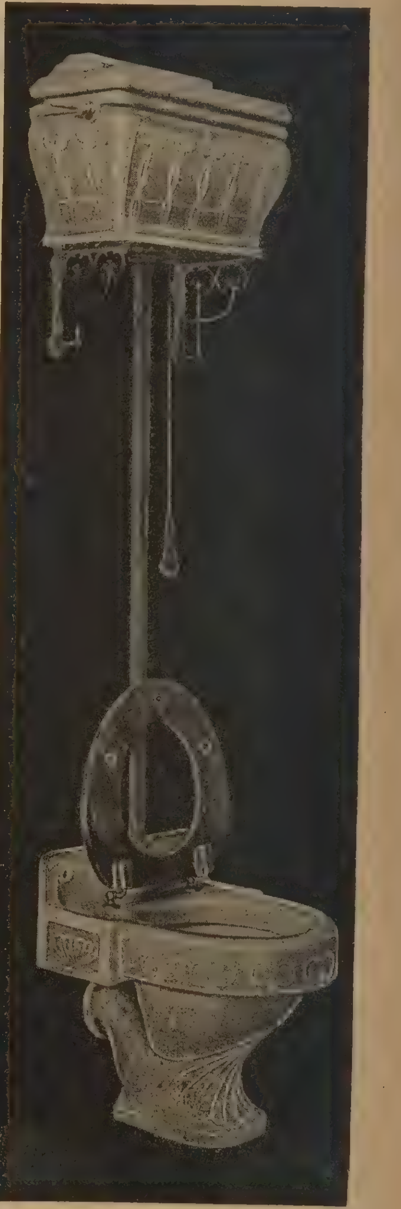
The work of resewering the whole of the city of Birmingham has been authorised by the City Council, and the Public Works Committee, who are responsible for its accomplishment, have commenced with the worst district—that embraced in the area known as Egbaston and Harborne Ward. The cost of this part of the undertaking is estimated at £155,000. The work, which was begun early last summer, is one of considerable magnitude, for it involves the laying down of sixty-four miles of sewers, and will not, it is expected, be completed under four years. The Public Works Committee have about 500 men engaged in the enterprise at Harborne and in the Pershore Road district, while similar operations, conducted by two contractors, are in progress in connection with the Chad Valley sewer and the Rea main sewer. The sewers are laid at the rate of one mile a month. In addition to laying down foul-water pipes, storm-water pipes have to be placed underground, and Mr. Price, the city surveyor, states that it is, as a rule, impossible, having regard to the stability of the work, to carry out the two operations at one time.

With regard to the suggestion that the two sets of pipes might be laid in one trench, thus avoiding the opening of the ground on two separate occasions, the explanation is that it is scarcely practicable, because the outfalls for the two sewers are entirely different. The outfall for the storm water is the river Rea, and that for the foul-water sewer (which is considerably below the level of the bed of the Rea) is Saltley. The foul-water sewer is generally laid at a depth of from 10ft. to 12ft., whereas a depth of 5ft. or 6ft. is sufficient for the storm-water pipes. If there were a difference in depth of not more than 2ft. between the levels of the two sewers it would be possible to place the two sets of pipes in one trench by laying the storm-water pipes on a bench of earth. That is an advantage, however, which rarely occurs, because the difference of the levels, generally speaking, is more than 2ft., and in such cases it would be dangerous to lay the pipes in one trench, since the sinking of the earth, in the process of consolidation, would be intensified in the greater depth, and the result might be a displacement of the earth-bench on which the storm-water pipes rested. If that occurred, the storm-water pipes would be interfered with, their action would not be efficient, and in the course of a comparatively short period the ground might have to be reopened to remedy defects.

Dr. H. H. Vernon, J.P., medical officer of health for the Southport Corporation, died last week at the age of sixty-eight. He was appointed medical officer in 1873, and the main drainage scheme of the town was carried out soon afterwards.

SOME NOTEWORTHY SANITARY APPLIANCES.

A retrospect of the architecture produced during the last hundred years will be less edifying than it ought to be, and to-day there are houses being put up which are a disgrace to those who designed them and to the profession generally. But upon one thing all critics are agreed, presumably because they cannot disagree, that the advances made in sanitary work are both surprising and satisfactory. A comparison of the methods of disposing, for instance, of house refuse at the present time and half a century ago fills us with astonishment that the death rate in the old days was not much higher than it was.



A "TITANITE" CISTERN AND CLOSET.

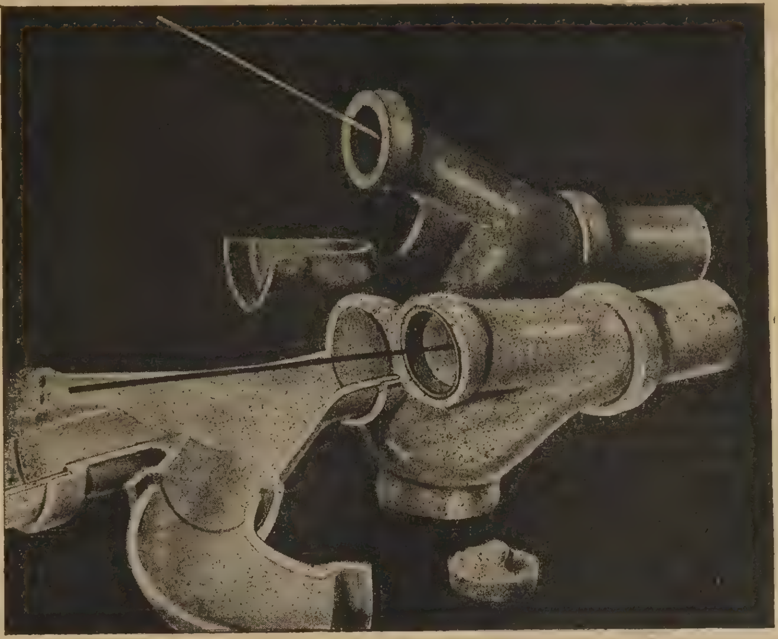
It has been said, and no doubt with much truth, that the present is an engineering age rather than an architectural one, and this being so, it is only natural that improvements follow improvements in all sorts of appliances and systems. Sanitary engineering is no exception to the general rule, though in many branches it can only be in the details that there is scope for improvement; the bases have been found, and will remain unchanged.

In the matter of these details Messrs. Adams and Co., of 72, Park Lane, Leeds, London, &c., have taken much interest. With regard to traps, for instance, it is desirable in modern work to sight from manhole to manhole, and to secure direct inspection. Adams level-eye trap is so formed, the trap itself being twisted slightly to one side, that for inspection and cleansing it is practically level; a rod can thus be freely used, or a light readily seen, from manhole to manhole.

It has formerly been considered proper to case in (with wood, &c.) latrines for barrack use, and to flush these by hand-controlled valves. Messrs. Adams and Co. have supplied a new type. The circular pans are made of very strong glazed ware, and a flat back provides good seat attachments. The pans are connected to a horizontal pipe, at the extreme end of which is a large rubber plug to prevent, until lifted, the exit of water, &c. A flush tank above delivers water direct to a central pipe, from which a supply to each pan is taken. The two plug valves are coupled and raised by the attendant in one operation, thus allowing the outgo of the excreta and its flushing forward by the discharge from above, an excess amount of water filling the pans again to the requisite level. No boxing up or casing is required, and the pans are accessible for cleansing in every part.

Trough closets are undoubtedly convenient. They are not generally, however, as sanitary as it is possible to make an apparatus of the kind. The large open surface of the trough, and the floating matter in the liquid itself waiting removal by the flush, is objectionable and possibly dangerous. To obviate such troubles a latrine has been brought out by Messrs. Adams with pans of strong, highly-glazed ware connected to a horizontal pipe; the form of the pan with the perfectly flat back prevents the accumulation of dirt, &c., behind. Water is retained to a sufficient height, and a flush tank of small capacity discharges at intervals, so that the pans are virtually always free from deposit. The same latrines, as also single pans, may be fitted with pneumatic control, which starts the flush at any desired interval after use. The water supply is thus automatically shut off when not required, effecting a considerable saving.

Messrs. Adams have found it impossible to produce in fire-clay the strong, and, at the same time, high-class goods required in modern work, such as unprotected closets, lavatory basins, &c. They are, therefore, manufacturing these in their new material "Titanite," which is a mixture of clays that lends itself not only to strength of structure and high glaze, but also to artistic design. The closet set illustrated shows this, the cistern and closet being made of "Titanite." It will be seen that the closet has a back skirting, with a vertical flush pipe inlet, the seat being attached by silver-plated hinges. The cistern, as shown, is syphonic. The cistern brackets are of brass, lacquered.



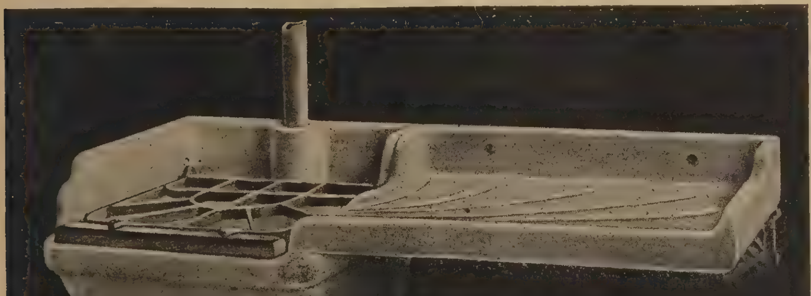
LEVEL-EYE INSPECTION TRAP.

In the asylum or hospital closet set made by the firm there is a flat back, which prevents, as already stated, the accumulation of dirt, and enables a thorough cleansing to be effected, while the square base support gives the strength so necessary for such work, avoiding at the same time the need for building into wall.

The upper portion of the "Lotus" urinal is rectangular, whilst the lower part takes the usual angular form, thus securing more space at the top than exists where capping is of curved or rectangular form. A front outlet discharges direct to the drain, obviating the need for the insanitary open gutter and metal grating.

A new "Bedford" urinal is manufactured by Messrs. Adams in their "Titanite" ware. It is fitted with accessible downpipe, a matter of considerable importance for cleansing when it is realised that to cleanse an ordinary downpipe is impossible, and that the downpipe is generally the chief cause of smell.

The original deep trap automatic flushing tank, as manufactured by Messrs. Adams, does not, like other flush tanks, require a reverse ball valve, a tipping bucket, or other mechanism. It is so constructed that water rises to a level above the dome and gradually overcoming the pressure of air within forces the trap, syphonic action instantly following.



A SLOP SINK.

The slop sink illustrated is an adaptation of the firm's flat back pan, and is formed with a flat back for greater cleanliness, a hinged grating, and, where desired, bed pan cleansing jet, &c., and slop drainer. Constructed of fireclay, the whole forms one of the simplest and most cleanly sinks made.

Messrs. Adams also make a "Titanite" lavatory basin, which looks neat with its light brass (lacquered) brackets. The waste plug is supplied either in white metal or vulcanite.

Where it is desired to construct underground urinals in positions where the sewer is not of sufficient depth, Adams' patent sewage lift may be used with advantage. The apparatus is entirely automatic, coming into operation only when there is liquid to be raised.

Masters and Men.

The Men at the Jarrow Cement Works are out on strike.

National Federation of Building Trades.—The annual meeting of the Midland Centre of the National Building Trades Employers' Federation was held last week at Birmingham under the presidency of County Alderman Bowen. In their report the executive board congratulated the members on the continued prosperity of the building trade in the Midlands, and after referring to the various meetings held during the last year and nine months in the area covered by the centre, made reference to the dispute in the early part of last year with the operative plasterers. Notwithstanding the signing of the agreement of May, 1899, differences continued to exist in several localities between the employers and the operative plasterers, and the efforts of the council of the National Association of Master Builders of Great Britain and Ireland to arrange a conference with a view to the settlement of the same had so far failed. The report further stated that since August last several new associations of employers in the building trades in the Midland area had been formed and affiliated with the Federation. The attention of the employers was directed to the movement in existence for the general federation of the various trades unions throughout the country, by which combination it might fairly be assumed the organised operatives would secure increased power to enforce their demands. In order that the employers might be in a position to effectively deal with aggressive action or unreasonable demands backed up by the trades unions, the executive urged upon al master builders and employers in the several branches of the trade the necessity for being combined in a national federation. The National Federation existed not for aggressive action, but for the protection and promotion of the common interests of the employers and the general welfare of the building trade. The report and statement of accounts were carried unanimously, and Mr. James Wright (Nottingham) was elected president for the ensuing year. The following officers were also elected: vice-presidents, Messrs A. Chambers (Leicester) and John J. Moffat (Birmingham); treasurer, H. Willcock (Wolverhampton); auditors, J. Sharman Wood (Worcester) and J. V. Porter (Derby). A deputation from the National Association of Master Plasterers waited upon the meeting for the purpose of asking the Midland centre of the federation to make an effort to settle the plasterers' dispute at Nottingham. This matter was discussed at considerable length, and it was decided to arrange a conference with the view of securing an amicable settlement.

Federation of Trade Unions.—A meeting of the Council of the General Federation of Trade Unions was held at Birmingham last Friday. Mr. Pete Curran presided, and there were about fifty delegates present, representing 380,000 members of trade societies. Amongst those represented were:—The Perseverance Carpenters and Joiners (451 members); Electrical Trades Union (880); Amalgamated Society of Engineers (85,121); Amalgamated Society of Gasworkers, Brickworkers and General Labourers (4,009); National Plate Glass Bevellers (551); National Amalgamated Labourers' Union (3,561); Navvies, Bricklayers and General Labourers' Union (3,221); Amalgamated House Decorators and Painters (4,397); and National Stove-grate Workers (1,415). The chairman, in welcoming the delegates to Birmingham, said they were assembled to endeavour to bring about a consolidation of labour forces which would ultimately abolish or, to a great extent, minimise industrial warfare. Since the Federation was inaugurated in July last year it had made rapid progress, and it now included over fifty societies, amongst them some of the largest in the country. At present they were engaged in interviewing the executives of a number of other societies which had not joined them, and the reports to hand were of a very satisfactory character. They thought that the majority of the organisations would join the federation. They did not believe that the establishment of the federation could in any way portend labour wars, but that consolidation would bring about more conciliatory methods of settling industrial problems than the use of that very injurious weapon the strike. They wanted to make it clear to the commercial as well as the industrial world that their object in federating was to meet employers in general on a common basis. A few days ago a meeting of the employers in the building trade was held in the city, and the chairman announced that it would be necessary for them to federate nationally, in order to meet the united forces of the operatives' federation. They wished them good luck, believing that if both bodies met on the common federation basis great questions would be better settled than they would be if action were taken in the sectional or isolated way which had been characteristic of the past.—The Secretary, Mr. I. Mitchell, announced that six months ago they started with forty-four societies and a membership of 340,000. Now they had fifty-two societies (two having just joined them) and a membership of 380,000. The balance in the bank was £8,000.—The delegates then proceeded to the business on the agenda, which had reference principally to the mapping out of the Kingdom into provincial centres, and the general questions of devolution arising thereon. The centres adopted for the various districts were London, Bristol, Birmingham, Manchester, Leeds, Newcastle, Glasgow and Belfast, the meetings to be movable at the discretion of the management committee. The management committee was instructed to proceed with the formation of district committees forthwith.

Aberdeen Painters' Wages.—The Aberdeen Master Painters' Association are making efforts to abolish the standard rate of wages clause in the rules of agreement with the operatives. They have written to the Secretary of the Painters' Union intimating their requirements in this matter, and also in regard to the definition of "country money," which, they say, should only take effect when the workmen proceed beyond the suburban area.

Workmen's Trains in Lancashire.—The Lancashire Federation of Trades and Labour Councils, which includes Bolton, Bury, Preston, Leigh, Manchester, Oldham, Wigan, Rochdale, Warrington, Burnley and other councils, are taking up the inadequacy of the railway companies' provision of cheap trains for workmen. The matter will be discussed at a conference of delegates in Manchester next Saturday, and, should the representations now being made to different railway companies fail, a huge petition to Parliament will be promoted. It is contended that the service of workmen's trains, particularly in Lancashire, is deficient, and that the accommodation is often very unsatisfactory.

Builders' Notes.

For stealing tools value 12s., a bricklayer's labourer was last week committed at Clay Cross Petty Sessions to one month's imprisonment.

Mr. Joseph Milburn, J.P., of Whitley and Marlborough, Wilts., died last week. He was the patentee and manufacturer of Milburn's noiseless revolving chimney cowl.

A Warning to Painters.—On Wednesday last, in a County Court action at Westminster, a Mr. Hunton claimed £40 for damage done to his face and clothes through the fall of a paint pot from a ladder. The court awarded him £15.

A Huge Cement Combine.—It is stated that a very important combination of cement manufacturers is in process of arrangement, and a company is being formed in connection with it. The capital is to be £9,000,000, of which a large part will be offered for public subscription.

Messrs. J. Mensaque and Brothers, encaustic and glazed tile manufacturers, who have works at Seville, Spain, inform us that they have opened an office and show room at 14, St. Mary Axe, E.C., where their Moorish tiles—exact copies of those in the Alhambra at Grenada, the Alcazar at Seville, and the Mosque at Corboda—may be inspected.

A Good Clock for Workmen.—Owing to the plea made by a number of late workmen that they could not hear the clock strike one, at the end of the dinner hour, the trustees of the Duke of Bridgwater have given an order for a large turret clock to be placed on their offices at Walkden. When one o'clock comes round the clock will strike thirteen times.

New Bridge over the Kelvin at Glasgow.—On Wednesday last the memorial stone was laid of the bridge now being constructed across the river Kelvin, at Kirklee Railway Station, a short distance above the Botanic Gardens, Glasgow. Mr. Forman, C.E., has designed a bridge which has an elliptical arch with a span of 80ft. and a rise of 31ft. 9in.; the soffit of the arch will rise 36ft. above the bed of the river. The main arch will be flanked by two semi-circular arches of 18ft. span, supporting the approach roads, and affording openings for ornamental walks to be formed on both sides of the river in connection with the Botanic Gardens. The masonry of the bridge is of Dumfries red sandstone, with polished granite columns in the balustrade. The roadway will be about 50ft. wide.

Old Bricks.—A collection of Chaldean bricks has just been exhibited by M. Heuzey, of the Louvre, to the French Académie des Inscriptions. The earliest were rudely shaped, evidently made without a mould, and had their upper faces arched, each brick marked by way of stamp by the impress of the maker's thumb. These, which were found in some quantity in the very lowest strata excavated at Telloh and Nippur, are considerably over 8,000 years old. Next to them came the bricks made for the city of Sirpula, bearing the ancient cognizance of that city—an eagle with a lion's head. And so we go through the stamped and dated bricks of kings like Eannadu, who reigned in Babylonia some four thousand years before our era, to the beautifully painted and glazed ones found by Layard on the site of ancient Babylon.

New Stone-Cutting Machinery.—A diamond saw for cutting stone has been patented by Mr. George Anderson, Taymouth Engineering Works, Carnoustie, and there is now one at work in the establishment of Councillor James Stewart, quarrymaster and builder, at Grantsbank, Dumfermline. Hitherto a great drawback in connection with diamond saws has been the cost involved by the losing of the diamonds, but Mr. Anderson has devised a means by which the precious stones are prevented from dropping out. The principle adopted is that of fixing by electricity. The diamonds are dropped into small holes bored into steel sockets, and the sockets are then placed into an electric welding machine, with the result that the diamonds have a compact mass of metal sealed around them. The saw is 5ft. in diameter, and in its periphery 126 sockets are inserted at intervals of 1½in., 42 being in the centre and 42 at each side. At a recent test, the saw made 560 revolutions per minute, and on two occasions it cut a stone 4ft. 8in. long in eleven minutes, this being at the rate of a little more than 5in. per minute; but a much higher speed can be developed.

A Mart for Inventions.—The International Patentees' Exchange and Mart., Ltd., 1900, has been formed with the following main objects: To provide a central exchange for inventors; to afford them a permanent exhibition and sale rooms; to assist them in making their articles known to the trades interested and to the public; to expedite sales by bringing inventors and purchasers together; and to establish a laboratory, with qualified experts, and to provide motive power for demonstrating the efficiency of all kinds of patents. For exhibiting any article for twelve months, £1 per sq. ft. will be charged, and for an illustration in the syndicate's monthly magazine, with subject matter, the charge is £1 1s. Ten per cent. will be charged to the inventor when any sale is made by the Exchange; fees for demonstrating by motive power, or otherwise, the capabilities of inventions to be arranged. Premises comprising 20,000ft. super. have been provided at 142-146, Old Street, London, E.C., where all communications may be addressed. The exhibition will be free to the public (except Wednesdays, which day is reserved for members and exhibitors only) and will be run entirely upon commercial lines for the assistance of inventors.

Can Fire Hydrants be used for Ordinary Purposes?—On Friday last, in the High Court of Justice, the special case of the London County Council v. the East London Waterworks Company was heard. The questions for the opinion of the Court were:—(1) Whether hydrants, fire-plugs, and apparatus provided by the defendants pursuant to section 32 of the Metropolitan Fire Brigade Act, 1865, and (or) section 34 of the Metropolis Water Act, 1871, might, in the absence of any agreement under the London County Council (General Powers) Act, 1894, lawfully be used for any purpose other than supplying water for extinguishing fires. And if the Court should answer the preceding question in the affirmative (2) whether such additional user was limited to the purposes specified in section 37 of the Waterworks Clauses Act, 1847, or to any other purposes; (3) whether such additional user might take place without the consent of the London Council; (4) whether such right of user was confined to the defendants themselves, or might with their permission be exercised by other persons. Mr. Justice Bruce said that he was clearly of opinion that the first of the questions ought to be answered in the affirmative. With regard to the others his Lordship answered (2) in the negative, (3) in the affirmative, and (4) in the negative. Mr. Justice Phillimore concurred.

Building at Whitby has been fairly brisk during the past year and bids fair to continue this year. Extensive alterations and additions have been made to the Hotel Metropole; a new bank for the York Union Banking Company is nearing completion (Mr. Gwyther, of London, is the architect); a large block comprising some shops and a boarding house has been built in the main street from the designs of Mr. E. H. Smales; and there is a parish room in course of erection. A large hydro. establishment containing 120 bedrooms will shortly be commenced on the sea front. The Town Council are providing new lavatory accommodation and shelters near the Marine Parade, and are laying out pleasure grounds on the Khyber Pass. A great many shop front alterations have recently been made. Several villas have been and are being built on land near the sea with half-timbered and stucco fronts from designs by Mr. G. S. French, architect; also, in the Avenue, some are being erected from designs by Mr. Henry Walker, architect; villas are also being built in many other parts of the town, and at Robin Hood's Bay. At Sleights some bungalows and small villas have been erected from plans by Mr. G. S. French, Messrs. Clark and Moscrop, of Darlington, and Mr. Milligan; while at Sandsend, near Whitby, a large hotel is being built on the esplanade, and bungalows on land belonging to Lord Normanby. Amongst other works to be commenced shortly are a cottage hospital, an electric light station, a new bridge over the river, and a Methodist church.

Engineering Notes.

New Waterworks for Llanelly.—For the construction of additional waterworks at Llanelly the tender of Mr. Lewis P. Nott, the contractor for the new dock now in the course of construction, has been accepted. It was the lowest.

The new Tugela Bridge, in the construction of which the Patent Shaft and Axletree Company, Ltd., of Wednesday, have made a world's record, is 105ft. long and 16ft. 6in. wide, weighing about 750 tons. Though built from special and not from stock designs, the bridge has only taken three weeks to complete.

Millbay Station, Plymouth, is being enlarged. The work was commenced two years ago, and everything is expected to be completed in eighteen months' time. The cost to the Great Western Railway Company will probably be £70,000. The railroad has been widened to from 80ft. to 90ft. and an additional platform has been provided. Local stone, with Portland stone dressings and bands of Torquay red stone, will be used for the station buildings. Mr. W. T. Jinkin is the contractor, but the Company are doing some of the work themselves.

Electricity for the London District Railway.—The District Railway Company has deposited a Bill for next Session asking for powers to construct a generating station at Chelsea in furtherance of the scheme for working the line by electricity. The company also asks for leave to work by electricity on its own lines, and on the lines of the Metropolitan Company over which the District has running powers. Provision is sought for the mutual supply of electricity, under agreement, between the Metropolitan, the District, and the Brompton and Piccadilly Circus Railway Companies.

A Tramway Power Station at Ringsend, Dublin, has been built for the Dublin United Tramways Company; it is said to be the largest of its kind in Europe or America. Two chimneys, 220ft high, have been erected on a base 28ft. high, built on concrete blocks, the brick lining of the chimneys being 10ft. in diameter. The boiler and engine houses are each 83ft. high from the lowest floor to the apex of the roof, while the main building has a width of 80ft. inside, with a steel roof in a single span of 200ft. The roofing is of terra-cotta tiles, with a strong slating on top. The coal tower is one of the features of the station; its machinery was furnished by Messrs. C. W. Hunt and Co., of New York. The equipment and arrangement of the Ringsend power station has now enabled the Tramways Company to operate over a hundred miles of street railway track. Mr. Bryden is the local representative of the consulting engineer, Mr. Parshall, of London. About 200 cars are now at work in the city and suburbs.

Leeds Association of Engineers. — The members of the Leeds Association of Engineers paid a visit the other evening to the Leeds Corporation Gasworks at New Wortley. After passing through the retort house, worked by hand, the visitors were shown two methods of stoking by machinery—namely, the West's compressed air and the Arrol-Foulis hydraulic systems, both of which afforded much interest. These machines draw and charge 450 through retorts five times every twenty-four hours, and are manipulated with ease by the machine men.

Incandescent Lighting: An Appeal Case.—In the appeal case of the Welsbach Incandescent Gaslight Company v. The New Sunlight Incandescent Company, action was brought to restrain an alleged infringement by the defendant company of the plaintiffs' patent of 1893. The defendants alleged that before the date of the patent the plaintiffs' predecessors in business, the Incandescent Gas Light Company (who in 1897 transferred the patent and their business to the plaintiff company, which was formed by way of reconstruction of the old company) had manufactured and sold the alleged invention, so that the patent would be invalid. The Court, on January 17th, dismissed the appeal, but ordered that the costs should be costs in the action.

Surveying and Sanitary Notes.

St. James's Church, Muswell Hill, N., is proposed to be removed and rebuilt, using as much of the old material as possible. It will also be enlarged, the cost of the work being estimated at £13,000.

Public Improvements at Matlock Bath.—On Wednesday a Local Government Board inquiry was held at the Town Hall into an application by the Urban District Council for powers to borrow £900 for purposes of public walks and pleasure grounds, and also for a new street.

Extensions at Aberystwith.—The Corporation propose to spend £12,723 in extending the marine promenade in front of the University College of Wales, and round the Castle point to South Terrace, and to build workmen's dwellings on a site adjacent to the Smithfield, at a cost of £3,200. A Local Government Board inquiry has been held.

Sir Richard Thorne's Successor.—The president of the Local Government Board has appointed Mr. William Henry Power, F.R.S., medical officer to the Board, in place of the late Sir Richard Thorne, K.C.B. Dr. H. Franklin Parsons and Dr. R. Bruce Low have been appointed assistant medical officers.

Drainage Scheme for Crofton, Wakefield.—Mr. R. H. Bicknell, an inspector of the Local Government Board, conducted an inquiry on Friday last into the application of the Rural District Council for power to borrow £6,000 for drainage purposes at Crofton and New Crofton, the repayment to extend over thirty years.

Sewage Works at Hindley Green, Wigan.—New sewage works at Hindley Green were opened on Wednesday last. The work has been carried out by Messrs. Brown, Phillips and Co., contractors, under the direction of Mr. A. Holden, the engineer and surveyor to the District Council, and comprises a sewage receiving well, 30ft. by 15ft. by 10ft. deep, sludge well, 20ft. by 10ft. by 10ft. deep; four settling tanks, each 40ft. by 20ft. by 6ft. deep; four artificial (coke breeze) filters, each 20ft. by 12ft. by 3ft. 4in. deep; inlet channel, sludge lagoon, screening chamber, engine house and store room, gas engine, and four pumps each capable of lifting 15,000 gallons 21ft. high per hour. The whole of the sewage requires pumping, but flows by gravitation to the works. The estimated cost of the works was £5,249, and the actual expenditure has been £5,056 14s. 6d. The system adopted is that of chemical precipitation in tanks, and filtration through artificial coke breeze filters. The effluent resulting is expected to satisfy the requirements of the river authorities.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—		
Jan. 26	Lossiemouth, Scotland—Alterations	....	C. C. Doig, Architect, Elgin.
,, 26	St. Pancras—Baths and Washhouses	Vestry	T. W. Aldwinckle, 1, Victoria-street, S.W.
,, 27	Brambridge, Hants.—Bridges	Hursley Rural District Council	Lemon & Blizard, Lansdowne Ho., Castle-la., Southampton.
,, 27	Wigton—Rebuilding Hotel	....	G. Armstrong, 24, Bank-street, Carlisle.
,, 27	Marazion, Cornwall—Additions	....	A. C. Jenkin, 3, Parade-passage, Penzance.
,, 27	Croydon—Additions to Schools	School Board	R. Ridge, School Board Office, Katherine-street, Croydon.
,, 27	Carlisle—Houses	T. and J. Bell	Johnston Bros., 39, Lowther-street, Carlisle.
,, 27	Hull—Cottages	Hull and Barnsley Railway Company	Engineer, 9, Charlotte-street, Hull.
,, 27	Stanground, Huntingdon—Police Station	Standing Joint Committee	E. Borissow, 151, High-street, Huntingdon.
,, 28	Wood Green—Houses	R. T. Baker	W. J. Chambers, Savoy House, 115, Strand, W.C.
,, 28	Guildford—Billiard Room	H. H. Winton	W. J. Chambers, Savoy House, 115, Strand, W.C.
,, 29	Dorchester—Alterations	....	A. L. T. Tilly, 26, South-street, Dorchester.
,, 29	Ebbw Vale, Mon.—Post Office	Miss Orchard	General Post Office, Ebbw Vale.
,, 29	Horsham—Chapels	Burial District Joint Committee	C. H. Burstow, 6, West-street, Horsham.
,, 29	Whitechapel, E.—Convenience	District Board of Works	M. W. Jameson, 15, Great Alie-street, Whitechapel, E.
,, 29	Croydon—Additions to Electric Lighting Station	County Council	Electrical Engineer, Factory Lane, Croydon.
,, 29	Sunderland—School	School Board	Office of Board, 15, John-street, Sunderland.
,, 29	Stratford-on-Avon—Wall	Town Council	Roden Dixon, Municipal Offices, Stratford-on-Avon.
,, 29	Ebbw Vale, Mon.—Houses	Mr. J. F. Jones	James and Morgan, Charles-street-chambers, Cardiff.
,, 30	Flamborough Head—Houses	Admiralty	Director, Works Department, 21, Northumberland-av., W.C.
,, 30	Swindon—Chapel	Primitive Methodists	R. J. Beetwick, 9, Regent-street, Swindon.
,, 31	Hull—Cottages	Corporation	A. E. White, Town Hall, Hull.
,, 31	Keighley—Hotel	....	Jackson and Fox, 7, Rawson-street, Halifax.
,, 31	Sheffield—Works	Health Committee	C. F. Wike, Surveyor, Town Hall, Sheffield.
,, 31	St. Mawes, Cornwall—Alterations	....	W. Swift, 38, Lemon-street, Truro.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—*Continued.*		
Jan. 31	Burton-on-Trent—Dwellings	Corporation	G. T. Lynam, Engineer, Town Hall.
,, 31	Keighley—Rebuilding Inn	....	Jackson and Fox, 7, Rawson-street, Halifax.
Feb. 1	Belfast—Hospital	Hospital Building Committee	W. H. Stephens & Son, 13, Donegall-square North, Belfast.
,, 1	Barrow-in-Furness—Government Offices	H.M. Office of Works	Office of Works, Storey's Gate, S.W.
,, 6	Bradford—Memorial Hall	Corporation	J. H Cox, Town Hall, Bradford.
,, 7	York—Offices	North Eastern Railway Company	W. Bell, Architect, York.
,, 7	Middleton—Electricity Works	Corporation	Lacy, Clirehugh and Sillar, 2, Queen Annes Gate, S.W.
,, 8	Camberwell—Stables, &c.	Vestry	Surveyor's Office, Vestry Hall, Camberwell.
,, 9	Rugby—Post Office	H.M. Office of Works	Office of Works, Storey's Gate, S.W.
,, 12	Preston—Alterations	Corporation	Borough Surveyor, Town Hall, Preston.
,, 13	Eastbourne—Mortuary	Lighting & General Purposes Committee	W. C. Field, Architect, Town Hall, Eastbourne.
,, 14	Middleton, Lancs.—Electric Works	Corporation	F. Entwistle, Town Clerk, Town Hall, Middleton.
,, 19	Egham—Additions to Schools	School Board	J. A. Engall, Clarence-street, Staines.
March 25	Thorndon, Suffolk—Shed	....	F. C. Foster, Torndon.
	ENGINEERING—		
Jan. 26	Sunderland—Electric Switchboard	Corporation	J. F. C. Snell, Engineer, Dunning-street, Sunderland.
,, 26	Valetta, Malta—Waterway in Tunnel at Sea-level	....	Superintendent of Public Works, Valetta.
,, 26	Rathdrum, Ireland—Waterworks	Rural District Council	B. Manning, Clerk, Board Room, Workhouse, Rathdrum.
,, 27	Madron, Cornwall—Waterworks	Urban District Council	Clerk to Council, Madron.
,, 29	Darwen, Lancs.—Converting Gasholder	Gas Committee	A. H. Smith, Manager, Gasworks, Charles-street, Darwen.
,, 29	Glasgow—Lift	Corporation	T. Young, 4, West Regent-street, Glasgow.
,, 29	Wokingham—Gasholder	Gas Committee	H. E. Jones, Commercial Gas Company, Stepney.
,, 29	Soyland, Yorks.—Reservoir	Urban District Council	R. Horsfall and Son, Commercial-street, Halifax.
,, 30	Copenhagen—Locomotives	Danish State Railways	Mechanical Dept., Colljornsensgade, 6, Copenhagen, V.
,, 30	Chard, Somerset—Waterworks	Urban District Council	G. and F. W. Hodson, Engineers, Loughborough.
,, 30	Glasgow—Heating and Ventilating Apparatus	Corporation	T. Young, 4, West Regent-street, Glasgow.
,, 31	Ayr—Pumping Plant	Magistrates and Council	J. Young, Town Buildings, Ayr.
,, 31	Plymouth—Electric Lighting Plant	Corporation	R. H. Rider, Prince Rock, Plymouth.
,, 31	Brightlingsea, Essex—Tank	Urban District Council	J. J. Osborn, Clerk, Foresters' Hall, Brightlingsea.
,, 31	Carnarvon—Sinking Shafts	....	J. Williams and Co., Dorothea Quarry Offices, Carnarvon.
,, 31	Ilkeston—Plant	Gas Committee	F. C. Humphreys, Gasworks, Ilkeston.
,, 31	Chichester—Mains, &c.	Guardians	F. B. Tompkins, Clerk, Chichester.
,, 31	Glasgow—Machinery	Corporation	City Engineer, City Chambers, Glasgow.
Feb 1	Worcester—Covering Water Tank	Corporation	T. Caink, Engineer, Guildhall, Worcester.
,, 3	Exeter—Septic Tanks	Council	G. R. Shorto, Town Clerk, Exeter.
,, 3	Belfast—Dynamoes	Electric Committee	V. A. H. M'Cowen, City Electrical Engineer, Belfast.
,, 3	Bradford—Electrical Equipment	Tramways Committee	City Surveyor, Town Hall, Bradford.
,, 5	Wimbledon—Roof	Urban District Council	C. H. Cooper, The Broadway, Wimbledon.
,, 6	Wath-on-Dearne, Yorks.—Heating	Hospital Board	W. T. Campsall, 19, Figtree-lane, Sheffield.
,, 6	Caistor, Lincs.—Water Supply Works	Rural District Council	Croft and Bentley, 21, Osborne-street, Grimsby.
,, 7	West Ham—Electric Plant	Guardians	F. E. Hilleary, Workhouse, Leytonstone.
,, 8	London, N.—Destructor, Cells, &c.	Wood Green District Council	G. J. Gunyon, Town Hall, Wood Green.
,, 8	Sudbury, Suffolk—Boiler	Waterworks Committee	T. W. A. Hayward, Engineer, Town Hall, Sudbury.
,, 9	West Ham—Electric Lighting Plant	Union	Clerk, Union Workhouse, Leytonstone, E.
,, 12	Todmorden—Reservoir	Corporation	Town Clerk, Town Hall, Todmorden.
,, 12	Edinburgh—Gas Exhausters	Gas Commissioners	W. R. Herring, Engineer, Edinburgh.
,, 19	Loughborough, Leics.—Reservoirs	Corporation	G. V. and F. W. Hodgson, Engineers, Loughborough.
,, 22	Ludlow—Converting	Union Gas Co.	W. H. Whitehouse, Manager, Union Gas Co., Ludlow.
,, 22	Ludlow—Purifiers, &c.	Union Gas Co.	W. H. Whitehouse, Manager, Union Gas Co., Ludlow.
Mar. 1	Melbourne—Electric Lighting Plant	Corporation	Agent-General for Victoria, 15, Victoria-street, Westminster.
	IRON AND STEEL—		
Jan. 29	Wealdstone, Middlesex—Fencing	Urban District Council	F. H. Parr, Surveyor, Council Offices, Wealdstone.
,, 30	Great Yarmouth—Rails	Town Council	J.W. Cockrill, Borough Surveyor, Town Hall, Gt. Yarmouth.
,, 30	London, S.W.—Lamp Columns	Wandsworth Board of Works	H. G. Hills, Clerk, Board Offices, East-hill, Wandsworth.
Feb. 5	Wimbledon—Roof	Urban District Council	C. H. Cooper, Engineer, The Broadway, Wimbledon.
	PAINTING AND PLUMBING—		
Jan. 29	Walsall—Painting	Corporation	Borough Surveyor, Bridge-street, Walsall.
Feb. 5	Manchester—Painting	Lancashire and Yorkshire Railway Co.	Engineer, Hunts Bank, Manchester.
	ROADS AND CARTAGE—		
Jan. 27	St. Anne's-on-the-Sea—Making-up	Urban District Council	The Surveyor, Park-road, St. Anne's-on-Sea.
,, 27	Swinton, Lancs.—Materials	Urban District Council	J. Berry, Council Offices, Swinton, near Manchester.
,, 27	Burnley—Road	Rural District Council	S. Edmondson, 18, Nicholas-street, Burnley.
,, 29	Beckenham—Making-up	Urban District Council	J. A. Angell, Surveyor, Berkenham.
,, 29	Farnham—Works	Urban District Council	R. W. Cass, Surveyor, Farnham.
,, 29	Penge—Making-up	Beckenham Urban District Council	J. A. Angell, Surveyor, Council Offices, Beckenham.
,, 30	London, N.—Works	Hornsey Urban District Council	E. J. Lovegrove, Engineer, Southwood lane, Highgate, N.
,, 31	Gainsborough—Granite	Urban District Council	H. Riley, Engineer, Council Offices, Gainsborough.
,, 31	Kingston-on-Thames—Kerb, &c.	Corporation	Surveyor, Clattern House, Kingston-on-Thames.
Feb. 1	Bethnal Green—Broken Granite	Vestry	F. W. Barratt, Vestry Hall, Church-row, Bethnal Green.
,, 3	Norwich—Granite	County Council	T. H. B. Heslop, County Surveyor, Norwich.
,, 5	Midhurst, Sussex—Various	Rural District Council	A. G. Gibbs, Council Offices, Midhurst.
,, 5	London, N.—Road Works	Finchley Urban District Council	Council Offices, Bibbsworth House, Church End, Finchley, N.
,, 5	Leeds—Road Works	Rural District Council	E. J. Silcock, 10, Park-row, Leeds.
,, 5	Warrington—Forming and Paving	Paving and Sewerage Committee	T. Longdin, Surveyor, Town Hall, Warrington.
,, 5	London, W.—Sand, Shingle, and Cement	Paddington Vestry	Surveyor, Vestry Hall, Harrow-road, W.
,, 8	Seaford—Street Works	Urban District Council	Surveyor, 3, Clinton-place, Seaford.
,, 14	Chester-le-Street—Road	Rural District Council	D. Balfour & Son, 3, St. Nicholas-bldgs., Newcastle-on-Tyne.
,, 14	South Shields—Material	Corporation	S. E. Burgess, Engineer, Chapter-row, South Shields.
	SANITARY—		
Jan. 26	Braintree, Essex—Drainage Works	Urban District Council	Surveyor, Vestry Hall, Braintree.
,, 26	Chesterfield—Sewerage Works	Rural District Council	H. Silcock, 14, Westgate, Mansfield.
,, 29	Glossop—Sewerage Disposal Works	....	T. S. Bowden, Union Offices, Glossop.
,, 29	Farnham—Sewerage and Drainage	Urban District Council	R. W. Cass, Surveyor, Farnham.
,, 29	Hexham—Sewers	Rural District Council	H. W. Taylor, St. Nicholas-chambers, Newcastle-on-Tyne.
,, 30	Hove, Sussex—Removal of Refuse	Town Council	Town Clerk, Town Hall, Hove.
,, 30	Tewkesbury—Drain	Rural District Council	J. Villar, 27, Cambray, Cheltenham.
,, 31	Burton-on-Trent—Sewerage Works	Corporation	G. T. Lynam, Engineer, Town Hall, Burton-on-Trent.
Feb. 2	Barking, Essex—Stoneware Pipes	Urban District Council	C. F. Dawson, Surveyor, Barking.
,, 9	Ulverston—Sewerage Works	Rural District Council	C. W. Dean, 3, Benson-street, Ulverston.
	TIMBER—		
Jan. 29	Littlehampton, Sussex—Oak Fencing	Urban District Council	H. Howard, Surveyor, Town Offices, Littlehampton.
Feb. 5	London, W.—Wood Blocks	Paddington Vestry	Surveyor, Vestry Hall, Harrow-road, W.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Jan. 31	Dunoon—Improvement of East Bay	£100, £50, £25	J. V. Clery, Clerk to Burgh Commissioners, Dunoon.
Feb. 12	Barnsley, Yorks.—Church and Vicarage	£52 10s., £31 10s., £21	Lancaster and Sons, Church-street, Barnsley.
,, 28	Findochty, Scotland—Harbour Improvements	....	Clerk of Commissioners, Findochty, Scotland.
,, 28	Doncaster—Isolation Hospital	£25, £15	F. E Nicholson, Solicitor, Union Offices, Doncaster.
Mar. 12	Belfast—Assembly Hall	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast.
,, 31	Walsall—Municipal Buildings	£100 awarded to each selected competr.	J. R. Cooper, Town Clerk, Borough Offices.
,, 31	Springfield, Essex—Constabulary Headquarters	£100, £50, £25	H. W. Gibson, Shire Hall, Chelmsford.

Property and Land Sales.

FREEHOLD BUILDING LAND to be LET on LEASE, or SOLD in PLOTS; fronting on main road, and close to golf links and Highgate Woods; near Muswell Hill and East Finchley Stations. Liberal advances if required to responsible Builders.—For plans and particulars apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington Road, N. 4

Sales by Auction for the Year 1900.—Messrs.

DEBENHAM, TEWSON, FARMER, and BRIDGEWATER beg to announce that their SALES for 1900 of ESTATES, Investments, Town, Suburban, and Country Houses, Business Premises, Building Land, Ground-rents, Advowsons, Reversions, Stocks, Shares, and other Properties will be held at the Auction Mart, Tokenhouse-yard, near the Bank of England, in the City of London, as follows:—

Tuesday, January 30th
Tuesday, February 13th
Tuesday, February 20th
Tuesday, February 27th
Tuesday, March 6th
Tuesday, March 13th
Tuesday, March 20th
Tuesday, March 27th
Tuesday, April 3rd
Tuesday, April 10th
Tuesday, April 24th
Tuesday, May 1st
Tuesday, May 8th
Tuesday, May 15th
Tuesday, May 22nd
Tuesday, May 29th
Tuesday, June 12th
Tuesday, June 19th
Thursday, June 21th
Tuesday, June 26th
Thursday, June 28th
Tuesday, July 3rd
Thursday, July 5th
Tuesday, July 10th
Thursday, July 12th
Tuesday, July 17th
Thursday, July 19th
Tuesday, July 24th
Thursday, July 26th
Tuesday, July 31st
Tuesday, August 14th
Tuesday, October 9th
Tuesday, October 23rd
Tuesday, October 30th
Tuesday, November 13th
Tuesday, November 20th
Tuesday, December 4th

By arrangement, Auctions can also be held on other days in town or country. Messrs. Debenham, Tewson, Farmer, and Bridgewater undertake Sales and Valuations for Probate and other purposes of Furniture, Pictures, Farming Stock, Timber, &c.

Detailed Lists of Investments, Estates, Sporting Quarters, Residences, Shops, and Business Premises to be Let or Sold by private contract are published on the 1st of each month, and can be obtained of Messrs. DEBENHAM, TEWSON, FARMER, and BRIDGEWATER, Estate Agents, Surveyors, and Valuers, 80, Cheapside, London, E.C. Telephone No. 503, Bank.

SALE DAYS for the Year 1900.
Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and CO. beg to announce that the undermentioned dates have been fixed for their AUCTIONS of FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, January 25th
Thursday, February 8th
Thursday, February 22nd
Thursday, March 8th
Thursday, March 22nd
Thursday, April 5th
Thursday, April 26th
Thursday, May 10th
Thursday, May 24th
Thursday, June 7th
Thursday, June 21st
Thursday, June 28th
Thursday, July 5th
Thursday, July 12th
Thursday, July 19th
Thursday, July 26th
Thursday, August 2nd
Thursday, August 9th
Thursday, September 27th
Thursday, October 11th
Thursday, October 25th
Thursday, November 8th
Thursday, November 22nd
Thursday, December 6th
Thursday, December 13th

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

Notice to Purchasers of Landed and Residential Estates, Town Properties, and Investments.—Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and Co. beg to announce that of the numerous PROPERTIES offered by them to Auction the undermentioned may now be treated for privately:—

CHELSEA, facing the Thames-embankment.—Important Freehold Building Estate of about 20,670 sq. ft. with shops and cottages and two valuable fully-licensed public-houses thereon, the whole producing a rental of £515 per annum, and capable of great and profitable development. In one or three lots.

PINNER.—Important Freehold Building Estate of over 47 acres with residence, occupying a beautiful position within five minutes from the railway station on the Metropolitan Railway.

SUTTON.—About 25 acres of valuable Freehold Land, ripe for immediate building development. To be sold in large or small lots.

BAGSHOT.—Freehold Estate of about 268 acres of heath land, commanding beautiful views, and offering several sites for high-class residences or a charitable institution.

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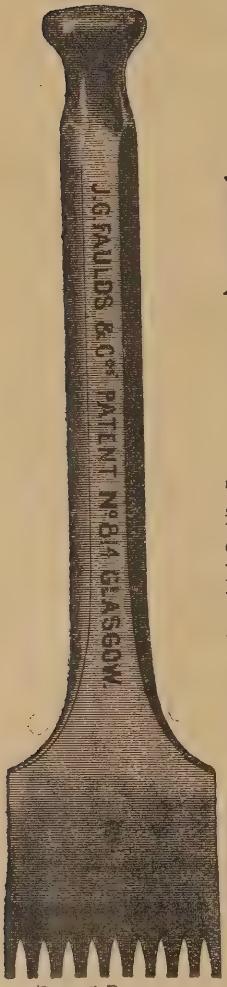
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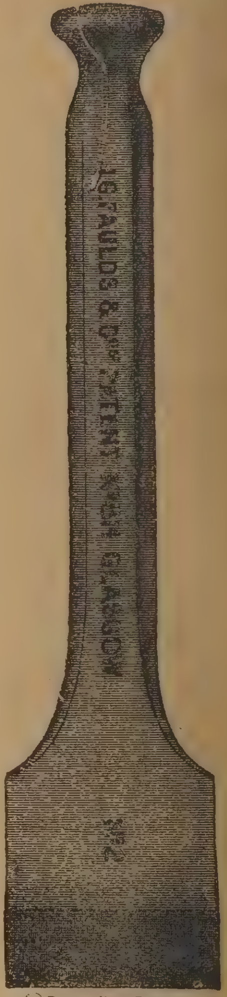
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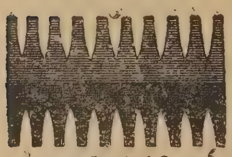

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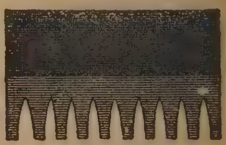

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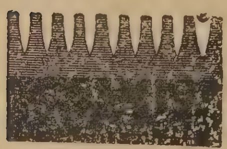

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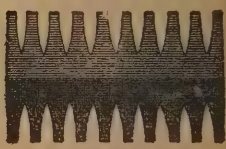

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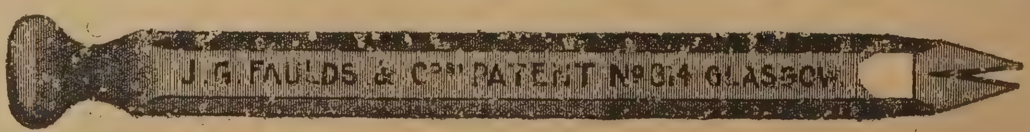
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JANUARY 31, 1900.
No. CCLX.

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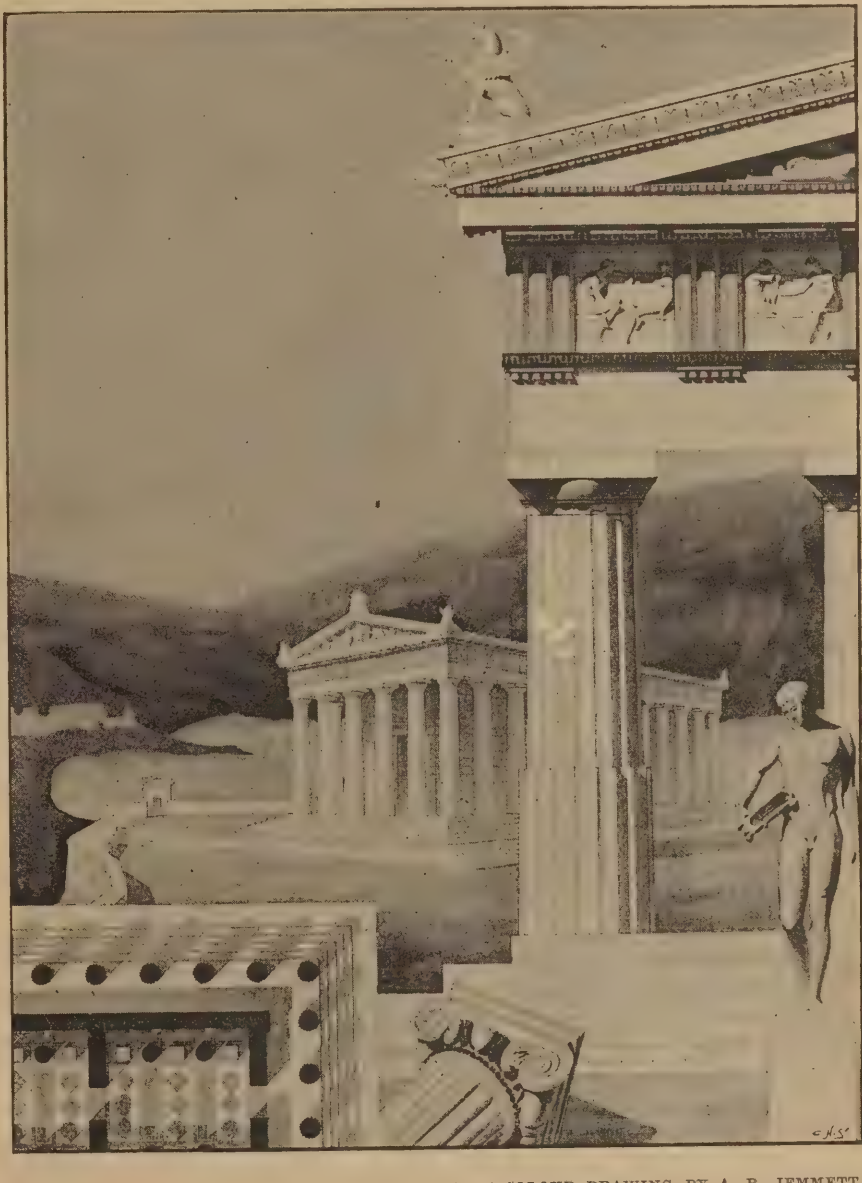
The first list of subscriptions to the BUILDERS' JOURNAL Shilling Fund will be found on Page 406.

An Architectural Causerie.

Signs of the Times. THERE are works in progress at the French Embassy, by Albert Gate—works which have for their object the enlargement of that huge and, exteriorly at least, ugly mansion, which was the first of the millionaires' palaces in London. These works have caused some alterations at Knightsbridge, by which one of the most singular sights in London has become imperilled, even if not to be destroyed: that curious sight, always pointed out to country cousins, of a church standing between two public-houses. This by the way; for we are not especially concerned with this extraordinary juxtaposition of Beer and Bible. It is the change at the Embassy and the memories it recalls which concern us, for in the works in progress here we find eloquent testimony of the growth during half a century of wealth and ostentation. To go back to the time when the building, which is now the French Embassy, was erected in 1845, is to be removed to quite another world. Albert Gate was formed then, and the two great mansions built which flank it. They grew to completion amid the wonderment of Londoners in general and the satire of the wits in particular. They were considered so huge that the possibility of their ever being occupied was scouted in the nickname they earned. The "Two Gibraltars" they were called, because, said those satirists, they could never be taken. One, however, was taken and that speedily. Hudson, the ex-draper and "Railway King," installed himself there, the millionaire of the moment; the other, less fortunate, was divided up and let in that way. It is now, however, in the occupation of one person. Hudson did not last long; like many another among our home-bred millionaires, or reputed as such, he could not retain the wealth he had amassed. The soil of England is not favourable to these monstrous growths which spring up suddenly here, and, like Jonah's gourd, vanish as swiftly. Hudson's crash was sudden and complete, and the Great Northern Railway Company came into possession of the mansion. Probably if the French Government had not taken it over, the Man in the Street would have been justified of his satire, and the place have remained unlet, for those were the days before modern Nabobs, whether of Emma Mine fame, whether Nitrate Kings, Diamond Kings, or the like, had come into existence, and the upkeep of such an establishment would have been prohibitive to ordinarily wealthy purses. Perhaps the first mansion to be built in London for one of the millionaire breed was the long-vanished "Kensington House" for the recently dead Baron Albert Grant. Mr. James Knowles, who also designed Tennyson's house at Aldworth, was the architect of it, and you may see the elevation duly set forth in the professional papers of that period, about 1873. Not that it is worth looking up, save for curiosity, for it exhibits the worst vices of the French taste of the period, and, like the Gothic house at Aldworth which has a Mansard roof, is utterly indefensible.

The point with us at present, however, is that when Grant failed no one was found wealthy enough to risk taking the great vulgar palace built for him and never occupied from the day of its completion to that of its demolition. Far otherwise, with the continual growth of wealth, would it be to-day, when every mushroom plutocrat builds a mansion in Park Lane or in some other equally famous spot. Only, a curious fatality seems to impend over those of the new rich, who build for themselves these lordly pleasure-houses. Barnato had not quite seen the completion of his flamboyant mansion before his end came, and "Colonel" North, who indeed did not build in town, but at Avery Hill, Eltham, died—and *not* the millionaire he had been—shortly after he removed into that palatial residence. But these more recent houses, as ornate as and larger than those of a generation ago which could not find tenants, are soon peopled again when they are to let. For the standard of living is rising, and wealth is growing, and no mansion in town is large enough nowadays to be dubbed a "Gibraltar" for the reason that the French Embassy was originally so named more than fifty years since. C. G. H.

Vandyck and Rubens. THERE is magic in dates if they are rightly assorted, and to those who regard art history as but part of the world's history the significance of Rubens' birthday in the year 1577 should not be overlooked. His pupil Vandyck saw the light in 1599, and Velasquez in the same year.



STUDY FOR A GRECIAN TEMPLE. FROM A WATER-COLOUR DRAWING BY A. R. JEMMETT.
(*See Page* 401).

Whilst the paintings at Burlington House are attracting so much attention the works of his master should not be forgotten, and those at present on view at the New Gallery are particularly worthy of notice. The most splendid, perhaps, is a "Moonlight Scene," which might be chosen to illustrate the first chapter of a Complete History of Landscape Painting, and which either Hobbema or Van der Near may have studied.

We spoke in a recent article of the earlier works of the Flemings, and may be allowed to continue where we left off. It was said that with the substitution of canvas for wood a new epoch of art commences, for, judging of what meets the eye in modern work one would say that painting in oils upn canvass must be reckoned a plastic art, the media being so much in evidence that we hear more about the executant's mastery than about the subject or anything else. One may feel as little respect as Voltaire for Philip IV. of Spain, and yet look with delight on the portraits Velasquez painted; and the same may be said with a difference of the English king and his court.

To Vandyck, among painters of portraits, must the palm be given? A portrait to one who can paint comes as naturally into the day's work as anything else that turns up, and there was hardly a painter amongst the old masters who did not produce some unsurpassable work of this kind. It may happen, of course, that portraiture becomes a mere business as soon as the talent is recognised. Take Millais, for instance. He was as regularly at work in his studio during his most prosperous years as a solicitor's clerk in an office. Nine months in London. Three months in Scotland, where most of his landscapes were painted. How much of such work was perfunctory, containing only as much of Millais as the patron may claim as his due, and how much of the Vandykes here? Whatever opinion he forms of this artist, the outsider need not be ashamed of it. If he says he sees nothing, then clearly he wants some help; if on the other hand that not more than a third seem to deserve more than a passing glance, and of the best that only some parts can be praised, he will, after saying all this, be entered in my good books as one who knows a good thing when he sees it, whatever it happens to be. Even I, who am expected to know more than I possibly can, may plead, excusing my ignorance, that out of one thousand Vandycks only fifteen are signed, and as for the remainder the consequence of this uncertainty is that there is a good deal of guesswork for critics, and some very painful experiences, for no sooner have marks of approval been set against the number of some supreme work than the "expert" happens along, leaving us of the same opinion as to its excellence, but depriving us of all the pleasure we had in thinking we knew a good Vandyck.

Now what of the style of these paintings, for it was that after all which determined the character of English portraiture until Reynolds and Gainsborough came. We see it depraved in the hands of Peter Lely, and Kneller, but in Gainsborough's sweetest portraits is the essence of Vandyck's style. The portraits themselves, inasmuch as they illustrate history, will always retain their value, and from this point of view the poorest may be the most interesting. The fat hand with its tapering fingers outspread, as useless as it is showy, may be thought to betoken the imbecility of its possessor, but this was not the painter's intention we know, nor the noble sitter's idea. The right leg like a Doric column, the left like a weeping willow—it may seem that there is nothing in Nature or art more futile and silly than the type preserved by Vandyck. But happily there are not a few exceptions to this very general rule, and amongst the world's wonders may be reckoned the best Vandycks.

Less potent in England, perhaps, because of Vandyck's establishment here, has been the influence of Rubens. His talent, applied indifferently to everything luscious and opulent within the domain of art, was exactly what the world wanted, and in France under Louis XIV. his influence must have been enormous. There is the perfection of composition and everything else in the laughably animalistic pseudo-classical scenes, of which drawings are shown in this gallery. We can trace to this source the guileless debauches of Ettz, whose once popular "tea trays" are only purified copies of Rubens.

ERNEST RADFORD.

On Reflection.

Registration Ridiculed. "A TRADE UNION of a distinctly vicious and mischievous type;" that is what, according to the "Liberty Review," the architectural profession will be if compulsory registration becomes law. We do not suppose our contemporary would apply such a description to the medical profession, or that it would advocate the throwing open of that profession to every quack who chooses to trade upon the gullibility of the public; yet, to be logical, it ought to do so. The demand for legal registration is simply a demand that the architectural profession shall be closed—as the medical profession has long been closed—against all who cannot give evidence of a certain standard of efficiency. This, the advocates of registration maintain, would have the two-fold advantage of protecting the public and raising the status of the profession. Continuing our analogy, we presume no one will deny that the medical man of to-day stands far higher in public estimation—and rightly so—than did the barber-surgeon of an earlier day who displayed a bowl of blood in his shop window as the symbol of his trade. It is beside the mark to point out, as our contemporary does, that many old houses were well built and beautiful, and that we have often no record of the names of the architects who built them, or of those who built the Gothic cathedrals. Registration is a modern remedy for a modern evil. But, of course, the "Liberty Review" cannot see the matter in this light; having a fixed idea that every addition—no matter what—to the functions of the State is an evil to be opposed as an attack upon individual liberty, it naturally misses the point of the agitation for registration, and pours scorn upon the idea of "architects by Act of Parliament."

Wanted, a Cheap Architect. IF anyone thinks that the status of architects is what it ought to be, let him peruse the following advertisement, which appeared the other day in a Welsh newspaper:—

TO ARCHITECTS.

THE TOWYN AND PENNAL SCHOOL BOARD offer a prize of £3 3s. for the best plans and specifications of Infants' School at Towyn, with accommodation for 120 infants, with offices, boundary walls, entrance gates, &c., cost not to exceed £500. The winning plans and specifications to be the absolute property of the Board. The Board do not bind themselves to accept the best nor any plan. The competitors are to state their terms for superintending the carrying out of the works, and for furnishing working drawings, full particulars, &c. Sealed plans and specifications to be sent, &c.

No doubt the members of the Towyn and Pennal School Board are estimable members of society, but is it not obvious that they must have a very low estimate of the dignity of the architectural profession? We dare say there will be plenty of competitors for the three guineas, and that the School Board will succeed in finding a very cheap architect. We do not blame them; they no doubt know the architectural market in Merionethshire better than we do, and we quote their advertisement simply as evidence of the depths to which a profession unrecognised by the State may fall.

Municipal Shortsightedness. IT is interesting to note what slow progress the advocates of large municipal enterprises make with the general body of the population concerned. In one place, a new town hall causes dispute, or perhaps the site for a new town hall; in another, the purchase of an open space for the public; in another, a scheme for electric lighting, or the erection of public baths; but the opposition to all these schemes has generally the same common cause, the fear of an increased rate. Householders have, naturally, a great horror of a large rate bill. But the matter of expenditure should not invariably overrule all other considerations. Here is a case in point. According to precedent, the good people at Portsmouth have long been discussing whether they should or should not build a technical institute for the advancement of the younger generation. At the back of the town hall there is a piece of ground known as the Mayor's Lawn, which, when the building was erected, was specially reserved in order to set off the architecture. This was a very good idea, but it is now to be set aside, for, by a majority of four, the Council have decided to build the technical institute on the spot. The admirers of the town hall have been pleading that such a course would be a desecration and a vandalism; besides which, they say, to put up a building in harmony with the town hall would entail an expenditure for extras equal to that which would be incurred in building on one of the eighteen other sites suggested. Of these sites, some had been declared to be too small, and some unsuitable in other ways; but the Council's committee decided this detail. Anyhow, it looks as if the technical institute is to be built by the side of the town hall, and that it will appear out of place there. Mistakes of this kind have their counterpart in almost every town, and they are continually being repeated. The provision of open spaces in front of large buildings, especially public buildings, is not considered half enough, and in a matter of this kind those in charge should be allowed a free hand, and not be hampered by a niggardliness which is made more prominent by silly extravagance in other directions.

Amateur Builders. THERE has just been opened at Bristol a Baptist Chapel, which has been erected in a somewhat novel manner. The congregation of the Victoria Park Baptist Church, wishing to add a new wing to their building, and not having the wherewithal to pay for the work, determined to do it themselves. Accordingly a number of what might be called "building picnics" were organised for Saturday afternoons, and, under the direction of certain expert members of the congregation, the whole of the work, with the exception of the bricklaying and plastering, was completed without costing a single penny for labour. There is something very admirable about the spirit and enthusiasm of these amateur builders, and specially pleasant is it to notice that a local contractor, so far from being filled with anger at the loss of a possible commission, made a present to the church of the stone used in the foundations. It is impossible, however, not to reflect upon the possible dangers of any considerable extension of this kind of thing. The jerry-built house we know, and even the jerry-built church, but how much better—one is inclined to ask—is the amateur-built house or church likely to be? To build badly because, with the best intentions in the world, one cannot build well is no doubt morally a less reprehensible proceeding than to build badly of set purpose with a view to pecuniary gain, but practically the results of the two things are the same. In the erection of any considerable structure it must not be forgotten that many highly skilled industries are engaged, and it is not to be expected that the zeal of the amateur will make up for the hard-earned skill of the experienced artisan. In making these remarks we are not reflecting upon the Victoria Park Baptist Chapel, which may, for aught we know, be a model of constructive excellence, but are simply pointing out a rather obvious danger attaching to experiments of this kind.

The Study of the Human Form and its Influence on Architecture.—III.

By A. R. JEMMETT.

(Concluded from page 367, No. CCLVIII.)

It is hardly possible to doubt that the study of the human form has had a certain influence on the architecture of the past, particularly on that of the Greeks, and so indirectly on all that which followed it. Vitruvius devotes a chapter to discussing the proportion of the human body, and suggests that the Greeks discovered in it certain definite proportions, which they applied to determine those of their temples. Viollet-le-Duc, commenting on this passage, considers there is more truth in its spirit than its letter, that instead of a metrical scale they more probably discovered a method; that they regarded man as the ideal of structure, and so endeavoured to design their buildings on the same principle.

Familiar as the architects of those days must have been with the human form in its highest development; when the undraped figure was continually before their eyes; when physical beauty was a popular cult, and wives made offerings to the gods for beautiful children; it would, indeed, be interesting to know how much of their exquisite sense of form and unerring taste was due to this familiarity. Perhaps we shall never rival them in these respects until we have equal opportunities, and take the same frank and wholesome delight in the beauty of the human form.

A TWELVE HOURS STUDY. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

It seems evident, also, that there were current among their philosophers many ideas not generally accepted now as to the inward and mystic significance of the human body, such as that of the macrocosm and the microcosm, and such ideas may have had a certain influence on the architects. Perhaps we shall never know their precise effect, or the full extent of the general influence of this study, but the evidence points to the conclusion that it was considerable, and suggests that we shall never arrive at a just appreciation of their architecture unless we have a previous appreciation of the human form.

But if the Greeks knew all that was to be learnt by observation of the form from without, we have the added advantage of systematically observing it from within, of understanding better the functions of the organs and the effect they have on the outward form. We can know it better as a structure, an organism, and are in a position—thanks to the comparative anatomists—to compare it with other organisms. The application of this comparative method, both to the structures of Nature and to the architecture of the past, is, perhaps, the one great advantage we possess over the architects of antiquity.

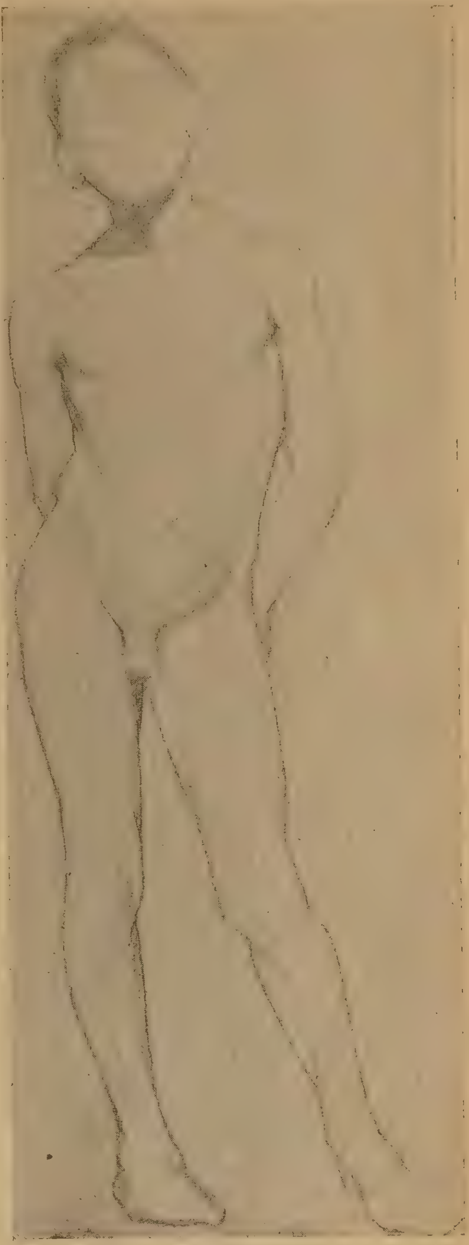
Let us then, for a moment, consider the human form as an organism, as a form which grows and develops in obedience to the creative force within itself; which is the natural and inevitable expression of that spark of the mysterious principle of life with which it had been endowed; which so presents a complete unity of conception, a separate and independent creation. For what else are the works of the architect but organisms also, which grow out of and express the living idea within, and present this same unity of conception? and what better precedent can be followed than their prototypes in Nature?

Now, if we apply the comparative method to the natural organic structures, we see why it is that man is the highest, and why his structure is the best precedent for us.

In every organism, from the highest to the lowest, we find a general law—that its structure shall tend to exactly express its functions, its needs, its nature, neither more nor less. In man, as the life is the highest and most complex, so too is the structure which expresses it. In simple organisms which fulfil one particular function, the characteristic form of the structure is adapted for that purpose, as that of the earthworm. In more complex organisms the form has to be equally adapted to several functions; but, some pressing need of existence often develops some organs out of proportion to the others, and so spoils the proportion of the form, as in the giraffe.

But in the more perfect ones we no longer find any one part developed at the expense of another—such as the vertebral column at the expense of arms and legs, as in the snake; or large hind legs at the expense of arms, as in the kangaroo—they are all more equally developed, and so the structure is more equally balanced.

Man seems to sum up in himself—to include, each in its due subordination—every faculty of the lower animals; in studying him we are studying all. Being endowed with reason, he no longer needs the special development of any organ. His nature, besides being the most complex, is thus the most equally developed, and the structure, which expresses his nature, is, therefore, the most equally developed also. It is the highest example of that beauty which is the result of perfect balance and proportion of parts, of the harmonious combination of many opposite qualities, the harmonious working together of many diverse functions. So that he presents a perfect model for the architect who has to balance the different parts of a large and complicated building; to give and take; to reconcile the conflicting interests of different departments; to keep every feature in due subordination to the rest; to provide for the fulfilment of every function, satisfy every need, and then to knit and weld the whole together into a beautiful organic structure.



A TWO HOURS STUDY. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

As in Nature, so in architecture, we find simple or complex organisms to perform simple or complex functions, to express a simple or a complex life. How simple is the organism of such buildings as a mortuary or a tithe barn. They fulfil but one simple function which suggests their characteristic forms; they express one simple phase of life and nothing more. How complex is the organism of a palace or a town hall, a hotel or a hospital. They fulfil many functions, express many phases of life. They have a centre of intelligence and administration which controls the whole body, means of rapid communication with every part, arteries through which the human life circulates, means for taking in everything necessary to their maintenance, and for passing away refuse. They might, without much exaggeration, be called the bodies of which man is the living spirit. When in daily use, and the tide of life ebbs and flows through their corridors and halls, they live and breathe; when shut up they sleep; when deserted they die, and, falling into decay, turn again to dust. Their existence, like that of a man, is for a limited time, but their memories, like his, may be immortal and influence generations yet unborn.

Who that has walked along the quay of the Seine, and watched across the water the vast grey mass of Nôtre Dame gradually unfolding its length and seeming to move as we pass, but must have been impressed by its organic unity of conception, and have felt a vague suggestion of some colossal and mysterious living creature sleeping midst the passion and tumult of the life around—a dreamless sleep of a thousand years. There, in the Isle of France, to the artist ever a sacred spot—a spark of the Promethean fire has descended; a germ, instinct with the mysterious principle of life, has developed into a glorious organic creation—expressing the faith of humanity and its unutterable longing for the face of the Unseen.

A TWO HOURS STUDY. FROM A CHARCOAL DRAWING BY A. R. JEMMETT.

To develop a parallel between the evolution of natural organic structures and of those recreated by the hand of man, to note the coincidences, to trace the common principles, were a fascinating inquiry, but impossible here. To take the human form alone and discuss it in detail, to suggest the various principles to be found therein—that all are alike in construction, all, so to speak, in the same style—infinite variations on one eternal theme; that the importance of every feature accords with the dignity of its function; that a feature is beautiful only in its right place;—were interesting and important, but beyond our scope. Besides, when we look for guiding principles of design, we shall probably see, each man for himself, that which appeals most to our own habits of thought, as much as each one of us is capable of seeing; but there is one point to which attention might be drawn, as having a distinct influence on our way of looking at things, on our ideals, our conception of architecture.

The more we know about the human form, the more we compare it with other structures, the more we see the universal tendency of Nature, that every feature shall have its structural, its physiological reason, shall exist only in the discharge of a function.

When we look, therefore, for the reason of the beauty of the figure, we can find nothing that has been introduced simply for the purpose of pleasing. Its beauty is not something added to an otherwise perfect structure, its beauty is the perfect structure; which structure is the result of its perfect organisation; the equal development, the harmonious working together of every faculty of human nature, physical, mental, and spiritual. Neither can we find any conscious effort to obtain beauty; it does not seem to be the primary object for which the structure was created. The real aim seems to be structural perfection, beauty to be the proof of this perfection; the beauty varying as the perfection of the structure.

There is, at the Museum of the College of Surgeons, a ghastly collection, which every architect should see, of imperfect human organisms and malformations; monstrosities at sight of which the natural man revolts. But why? Why do we instinctively turn from an eye in the centre of the forehead, or a leg in the centre of a stomach? As features, as limbs, they are as perfect as any other; yet should we not say that the man who admired them was unhealthy, unnatural? Why do they fill us with disgust? Is it that we—being so familiar with the natural, the normal structure — know instinctively that such features are in the wrong place, mean nothing, discharge no function, and destroy the organic unity of the whole; that the order of Nature has been interfered with; that the thing is unnatural; and is it not our nature to shrink from the unnatural?

If a perfect building can be compared to a perfect organism, to what can we compare those that have not this structural perfection, this organic unity, but to such monstrosities as these? And if we were as familiar with perfect models of architecture as with those of the human form, if our instinct was as true in the one case as the other, would they not fill us with the same disgust?

We are naturally led to ask how far such considerations apply to architecture, whether the same general organic tendency that is visible in Nature is visible there? Is the beauty of a building the result, the proof, of its structural, its organic perfection? Does its beauty vary as the degree of this perfection? Can a structure be perfect as a structure without being beautiful? It may be as perfect as reason can make it, but is it as perfect as it could be made, were enthusiasm and a passion for perfection added? Are the structures of the mechanician or the engineer perfect as structures? Do any one of their forms exactly express the necessities of the case, as we find them expressed in the human form? Is the precise form of a rolled iron joist, or a cast iron column, dictated by the strain upon it, or by convenience of manufacture; and, as two joists are rarely weighted exactly alike in practice, why are they made the same shape? Such forms are lifeless things, they tell us little of the strains to which they are subjected; but the bones of the human skeleton, or the trunk of a tree, are modelled to express the forces acting through them. They are, so to speak, evolved by the forces, the actual force itself materialised.

Is the lack of beauty in mechanical constructions to be attributed to this indifference to exact expression, this lack of feeling, of enthusiasm for perfection? Is not the difference between the artist and the mechanician, the architect and the engineer, this, that while the one reasons coldly, the other reasons at a white heat, and so gets a deeper imaginative insight, and produces a structure that more exactly expresses its nature; which is more beautiful because it is more perfect as a structure?

Should we then consciously strive after beauty? Is it not too elusive to be grasped in this way. Would it be better to aim, like Nature, at structural perfection, believing that beauty will be its ultimate reward, as happiness is said to be that of virtue?

If then we aim at this absolute perfection of organic structure which is to be seen in the works of Nature, can it be obtained without something of the gift of instinctive insight? But, on the other hand, is it safe to presume we have this gift, and to trust too much to our instincts?

No doubt we ourselves are works of Nature, and so, in a sense, it may be said that, inasmuch as the structures of birds or of insects are natural instinctive structures, so too are those of man. But this distinction must be drawn, that, whereas the brute creation blindly obeys the voice of Nature, and so builds by instinct perfect structures—is, as it were, a perfect medium through which the creative force of Nature can operate—to man has been granted free will, to obey, or not, as he pleases. Whereas a bee must build a perfect honeycomb, or a bird a perfect nest, because they cannot help it, man may build imperfectly and foolishly if he likes; and the point is, he generally does like. This privelege of making a fool of himself, of looking ridiculous, which distinguishes man above other animals, is one of which he is naturally proud. When he builds, he will surrender his reason without a murmur, ignore the existence of his moral sense, but this one privilege, his patent of nobility, he will defend with life itself.

STUDY OF A HEAD. FROM A CHARCOAL DRAWING BY A. E. JEMMETT.

A TWO HOURS STUDY. FROM A CHARCOAL DRAWING BY A. E. JEMMETT.

The instincts of a natural and perfect man would necessarily be perfect; doubtless he could always build instinctively and yet build truly; he would be, as it were, an instrument in the hand of Nature.

Carlyle, after quoting the dictum of Novalis that Shakespeare's dramas "are part of Nature, too, deep as Nature herself," remarks that "it is Nature's highest reward to a true, simple, great soul, that he gets thus to be a part of herself. Such a man's works, whatsoever he with utmost conscious exertion and forethought shall accomplish, grow up withal *unconsciously* from the unknown deeps in him—as the oak tree grows from the earth's bosom, as the mountains and waters shape themselves—with a symmetry grounded on Nature's own laws, conformable to all truth whatsoever." Might not this be an appreciation of some great master builder of the past, of ancient Greece or the Middle Age? Do not their creations grow? Are not they "grounded on Nature's own laws, conformable to all truth whatsoever"? And does not this remark help us to see why it is that Shakespeare's personality is not easily to be discovered in his works? A complete devotion to Nature leaves no thought for self. And when we come to consider the greatest achievements of architecture in this light, we see also how little they reflect the personal idiosyncrasies of their designers. Could we give an intelligent account of the individuality of Ictinus, as distinct from that of Callicrates, or any other contemporary architect? When we look at the Parthenon we forget to think of the architect, and so unconsciously pay him the highest possible compliment. And if we do attempt to look behind the art to the artist himself, do we discover anything but a tremendous intellect? If we look through the human form for Nature herself, do we see anything but an infinite power?

Does it not seem then that the more perfect the creation the less it betrays the creator's individuality; that the moment we perceive his individuality we perceive his limitations? Possibly the personality is there, but the main object of a building is not to advertise it.

The nature of the artist does, unfortunately, modify the conception that germinates in his mind; as the nature of the soil modifies the seed; as the nature of the parent modifies the offspring. But is this a thing to be proud of? When we see a perfect plant we do not think of the nature of the soil, we admire the plant; it is only when it is stunted or deformed that we have time or inclination to notice the poverty of the soil. So that in cultivating a distinct individuality, as is the fashion just now, we are only advertising our own limitations. Why cannot we be content to follow Nature? She does not go out of her way to produce crippled, twisted, and abnormal plants just to advertise the peculiar bad character of the soil in which they grew. Then why should we? If we must be original, let us be so by doing the thing that is artistically right; if we do this, we shall be original indeed.

It well may be that such conclusions as these are but fancies, which cannot be logically deduced from the human form; and if they can, it well may be they are beside the mark. But the truth is a diamond of many facets; from any point of view surely we can, if we will, catch at least a glint of its light. And though we are all too prone to see things as we wish to see them, to clip and trim the "Garment of God" to the size and shape of our own little theories; yet, if we do bring away from such a study as this misconceptions of what we have seen and felt, at least we have learnt how great is Nature, how insignificant are our own personalities.

PRIZE DESIGNS AT THE R.I.B.A.

A GRATIFYING feature of this year's competition is the good choice of subjects given for the principal designs. The Soane is an Art School situated in a park, and the Tite is an isolated clock tower and belfry. These programmes give the student a free hand, and save him the needless and irritating restrictions imposed by the bad sites and L.C.C. regulations that have usually been in force both at the R.I.B.A. and at the Academy.

A protest against deformed sites and arbitrary restrictions of all kinds has been made in this journal year after year. It is to be hoped that the Institute, having at last got rid of them, will never return to them, but will give the students a chance to produce, for once in their lives at least, complete architectural conceptions. Might one be permitted to suggest, as a further improvement, that in all such subjects as "A School of Art in a Public Park," a small scale plan be required of the immediate surroundings, and the laying out of the approaches, &c., as this is of as much importance as the building itself, and makes the scheme more complete?

With regard to the drawings submitted for these two prizes; the general impression is that there is great lack of characteristic design, presumably the result of want of thought or knowledge, and right method in designing. We find windows and doors, statuary and colonades, from Italian palaces and English churches of the seventeenth century, put into a school of art or a clock tower, without any regard to their meaning or fitness. This destroys all true artistic expression, and robs the designs of their interest and charm.

In the competition for the Tite Prize, the first place is awarded to Mr. Percy E. Nobbs, who has a practical, workable sort of design,

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well thought out, and illustrated by good drawings. The perspective has a good atmospheric effect, although the lower part of the tower seems a little out of tone with the upper part, and has perhaps too much work in it. Indeed, as a design, this tower strikes one as being in two different pieces, one above the clock and one below. The upper part might have been taken from a church of the Hawksmoor or Gibbs type, and there seems to have been no attempt to express characteristically just the definite features of the programme and nothing else. This design might have been improved by more of a base, to start it from the ground; it looks just a little as if it was a church spire cut off and stuck in the pavement. There is some nice carving in the detail, and the figures are good in intention and drawn in with some spirit. It is necessary, however, to take exception to the festoon hanging from the keystone, across the voussoirs of the arch, with the arch joints running through it. Of course, we have often seen it done, but it is not right, and it is not beautiful, and there is no need to go on repeating it.

A medal of merit has been awarded to Mr. W. A. Mellon for a design which is much more pretentious and not so good in style. Its features and details are almost absolutely characterless, though pleasing enough in themselves; and the design, as a whole, hangs together and stands up well. This tower stands on a raised platform approached by steps, and each side is treated alike, although there is a door in one side only. It is hardly the thing to have steps leading up to a window or a blank wall, and in a case like this, where only one door exists, it would have been better to treat the platform on the other sides of the tower differently from the entrance side. The prize design is better in this respect, as it has a few steps up to door only; the entrance side is treated differently from the others, and so is more expressive.

The design under motto "Fafnir," has more character than that placed second, although it is not so pleasing. The angles over the clock, filled up by the crouching figures, are very weak and unhappy. The drawings of this design are coloured; the perspective is not very good.

"Andromeda" has gone out of his way to produce a variant on the west front of St. Mary-le-Strand. Not knowing what to do with the unnecessary accommodation this provides, he calls it "museum." Surely it is so much better just to stick to the programme and give what is required; a clock chamber at sufficient height from the ground, a belfry over it, and a roof on the top.

The design by "Hollyhock" is interesting. The perspective shows a real ability for pen and ink, and the whole design somehow suggests that its author has it in him to do good work; but this is quite off the right lines. It is not in the least like a clock tower and belfry, and it irresistibly reminds one—with a thousand apologies to the designer—of a design from a child's architectural box of bricks, made in Germany. It is not practical. Where are the clock chamber, and clock case, and weights? Where are the bells hung, how do they ring them, what is the meaning of the segmental pediment, &c., &c.? It is a pity to see ability wasted in this way.

The design by "Kudos" has a certain amount of novelty and right character. The drawings are good, and the figures well put in.

The design by "Sphinx" strikes one as being one of the best. Its general appearance is more characteristic of its purpose. Its proportions are happier. It is treated with a wide-spreading base, with steps leading up from all sides to entrances on every side of the tower. Altogether it seems more original and more artistic.

The Owen Jones prize is awarded to Mr. G. A. Paterson for a dainty and delicate set of drawings that show much care and pains. They are principally from Italy and Sicily. The interior view of the aisle of St. Mark's, Venice, strikes one as being out of tone, and as not giving the colour effect of the original. San Miracoli seems better in this respect.

A medal of merit is awarded to Mr. J. B. Fulton for a set of drawings that are strong and rich in colour and show much ability. Mr. Fulton, indeed, seems to possess quite exceptional powers as a draughtsman. He exhibits a great number of sketches executed while on his tour as Tite prizeman for last year. Some of these sketches, such as the views of Rome and Florence, are quite charming; and the drawings of statuary are remarkable for spirit and strength. The great danger of this sort of work seems to be that the artist gets to look on every object, whether building or statue, simply as a subject on which to show his skill. Everything, however diverse its natural character, is rendered in the same way, and becomes simply an excuse for a charming black and white pattern and tangle of lines, and so the artist eventually begins to think a great deal more of the cleverness of his pattern than of the qualities of the objects he represents. His pencil simply runs away with him. This is hardly the way to derive much benefit from the works of antiquity, nor does it show sufficient respect, either to nature, or to the works of the great artists. Of these present drawings, while the views of Florence are delightful in their way, those of many of the well known buildings fail entirely to represent anything of their characteristic beauty; although at the same time they are charming as mere examples of line drawing. The same thing is seen in the drawings of statuary. There are, in some of them, a wonderful life and spirit, and a fine feeling for quality of line; but as a representation of the subject, look at the sketch of the Medici tomb by Michael Angelo, which really is no better than a caricature, as a representation of the figures of Night and Day. This design has been treated as an excuse for a pattern, and though this sketch exhibits the same fine quality of line, it is about as badly drawn, in the real meaning of the word, as it possibly could be. There is little doubt that Mr. Fulton has been endowed with a rare gift—a gift of the gods; might one be permitted to remind him that it carries with it an equal responsibility?

The Pugin Studentship has been awarded to Mr. James M'Lachlan, and a medal of merit to Mr. J. A. Woore. There are a great many drawings in for this prize, showing a high standard of work, and it cannot be easy to pick out the best, for there is not much to choose between several of the sets.

The silver medal goes to Mr. Fulton for his drawings of St. John's College, Oxford. A charming subject, charmingly rendered. The elevation to the quadrangle, with its wealth of carving, is illustrated by a most harmonious and artistic drawing.

The Soane Medallion has been awarded to Mr. C. E. Power for a design which exhibits so many and such radical defects that one is reluctantly forced to the conclusion that this award needs explanation. The only apparent reason for the success of this design is the pleasing general effect of the elevation, which is quiet, simple, and dignified. But the question is, how is this effect obtained? A glance at the plans reveals the fact that they have been distorted and spoilt to produce a purely arbitrary external effect, which, though pleasing in itself, is not the expression of the plan, and so, in an artistic sense, is false and dishonest. The width of the central projection, with large pediment, is purely arbitrary; it expresses the position of the main cross walls neither on the ground floor nor on the first floor, and these cross walls are not even over one another. The pediment itself is a sham. Behind it we find (instead of a roof following and expressed by the slope of the pediment) the roof ridge, parallel with the front of the building, and in the slope which starts up and back from the level of the spring of the pediment, the skylights for the life room, which is the central room on the first floor.

The two end projections, which form the angle features of the design, have nothing whatever to do with the plan, and simply express nothing. The corner rooms are utterly spoilt by this arrangement, and the projections are used as cupboards. The same thing happens to the lecture theatre end of the back elevation on the first floor

The range of four large windows, between the central and end projections, are again arranged without any regard to the rooms inside. Cross walls butt into the narrow window mullions. What would be the internal effect of the council room, with one large semi-circular window out of the centre, and a small portion of another jammed up in the corner? This sort of thing is not architecture. If the ground and first floor plans be compared it will be seen that they have little relation one to the other. Cross walls, with chimney stacks, shown on the ground floor, disappear entirely on the first floor, where the rooms occupy the entire width of the rooms below and the width of the corridor. The flues have therefore to be taken across half the width of the room and the width of the corridor to the outside wall before they get to the first floor level, where they are sometimes shown on the drawings and sometimes not. On the ground floor a library runs as one big room along one side of the building; on the first floor the main wall of the large hall is continued across this room as a thick, structural wall, with a chimney stack on it, butting against the outside wall over the centre of a large window; and the lecture theatre, which occupies part of the space above the library, has simply no connection with the walls below. This sort of thing is not even building.

The fact is that the ground floor is one design, the first floor is another, and the elevation is a third which has nothing to do with either.

Inside the building are two areas for light, which, on the ground floor, are none too large for light and ventilation; on the first floor a wide corridor is taken across one end, diminishing the area by about one-third. Apart from the bad construction, this is entirely contrary to the general principle that all such areas should get larger as they go up, and the building be set back, if possible, for the better admission of light and air. With regard to the elevation, taking it as we find it, and considering it simply as a screen to what is behind, it is possible that, as a matter of taste, it would have looked better if the four divisions of windows each side of the central block could have been three or five.

Considering that the designer has evidently felt himself at liberty to do as he liked in the matter, it is rather curious that he did not arrange this, and considering how much restraint and good feeling this elevation shows it really is very curious that he did not feel how hideously inartistic so false an effect must be. This design is illustrated by a perspective, which also appears to be somewhat of a false effect. The building is shown standing above a range of three terraces, with retaining walls, balustrades, and steps, which rise up from a lake or river. The height of the spectator's eye is taken somewhere about the level of the balustrade of the lowest terrace, while, at the same time, as much of the building is seen above the top of the highest terrace balustrade as if the eye was somewhere about that level. Had it been shown correctly the top balustrade would have cut off a considerable portion of the building, and would have given it quite another effect.

On seeing the award go to this design one naturally expected to find that all the others were similar, only worse, but this is not the case. One cannot help feeling that by this award a certain amount of injustice has been done to the other competitors, and from another point of view, a graver injustice still to the successful student, who will naturally be encouraged to proceed on lines that will lead him nowhere, for it is not too much to say—and it is a thing which should be said—that to produce architecture by such means as this is utterly and absolutely impossible.

Hanging just opposite to this design is one with the motto, "Insperata Floruit," which—whatever faults it may possess—is at least a sensible and straightforward plan, with a sound, general scheme of construction, which the author has endeavoured to express in a straightforward and natural manner in the elevations. Its faults in this respect are the architectural and refreshment rooms, and, in a less degree, the museum in centre. The central areas are far better than in the prize design, and, widening as they go up obtain a much better circulation of air. A fault that is common to both this and the prize design is that the main horizontal lines of the building do not express the floor levels. The large columns break through the first floor line, and the main entablature is, in this case, about half way up the height of the first floor floor. An attic above this entablature is perforated with circular openings. As these first floor rooms are principally painting and modelling classrooms, these circular openings, giving spots of light inside, are not good.

The elevation generally is not so pleasing as that of the prize design; by comparison it is clumsy, and many of the features are out of scale and proportion, but, what is of far greater importance, it is more truthful and more expressive of the plan. Taking this design all round, it is better construction, better expressed, and an attempt on right lines; and if this is so, it is better than the prize design, and more the sort of work that should be encouraged by the Institute.

To a great extent the same remarks apply to the design by "Tendimus." This also is straightforward construction, simply expressed. It has defects of arrangement, such as the position of the lavatories at and over the front entrance. It is no doubt handicapped by being in an unfashionable style, the Neo-Greek, but its elevations are, in their way, quite as good as the prize design, and the general construction of the scheme is far superior.

The great difference between these two and the prize design is that these two, in their different ways, with their different degrees of success, are both on the right lines, while the prize design is not.

Of the other designs, perhaps "Autumn Tint" is the best, though the plan has grave defects of arrangement.

Correspondence.

DAMP IN DISTEMPERED WALLS.

To the Editor of THE BUILDERS' JOURNAL.

HULL.

SIR,—With reference to the reply to "T. B. W." on page 376 of your issue for January 17th, I have had a lot of experience in colouring new walls with various distempers, and I find that, so long as you use only primary colours, everything works well. In nearly every instance where I have used green I have found that the lime in the plaster has eaten out the blue and left the yellow. Blues and greens should be especially avoided. Ochres, reds, browns, and pinks may be used without any fear.—Yours faithfully, P. T. R.

SEWAGE PURIFICATION WITHOUT FILTRATION.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, E.C.

Sir,—May we be permitted to again refer to some of the more important points raised in our letter in your issue of January 10th, to which Mr. W. Kaye Parry takes exception in his reply of January 17th?

We have read his address to the Dublin University Engineering Students' Society, and are quite willing to accept his figures; they are however, calculated from estimates for future installations, not from returns of actual working, such as those we quoted; and we submit that no matter how eminent the authority may be who prepares an estimate, the actual results of careful experiments are preferable as a basis of calculation.

We set out in our letter that our own experience had been in connection with small installations; but may it not be fairly argued that if a small plant can be worked economically, a larger one will show still better results.

The cost per million gallons of 10s. 6d. represents the cost of the nitrate of soda alone, nothing being allowed for preliminary screening, application of the chemical to the sewage, or sludge disposal; the figures we quoted respecting Sutton are taken from the published accounts, and cover a year's working in each instance, namely, the year ending March 31st, 1895, for chemicals and broad irrigation; and that ending March 31st, 1899, for biological treatment.

In the first case, 69,888,000 gallons cost on an average £15 11s. 11d. per million, taking into account the amount earned by the farm and sale of sludge, which came to £117 7s. in the year; in the second case, 157,164,000 gallons, or more than double the quantity, cost only £3 19s. per million, with a larger set-off from the farm of £384 19s. 4d.

The experience at Sutton has been that the effluent produced by the old system of chemical treatment would not satisfy the requirements of the Thames Conservators, while the biological effluent did, and still does to-day.

The sludge pressing cost £7 a week up to 1895; there is no sludge now, and no offensive odour proceeds from the beds with a flow of 500,000 gallons a day.

The sewage of Sutton may be described as domestic; moreover, it reaches the farm in a very short time after entering the sewers, and in a comparatively fresh condition, necessitating screening for the removal of paper; it also contains a good deal of mineral detritus.

The sewage of London presents more difficulties as it contains "manufacturing refuse of the most varied description" (we quote from the report of Dr. Clowes to the London County Council), and later in the same report, "the coke beds have removed the whole of the suspended matter or sludge." This refers to raw sewage.

Reporting on the sewage of Manchester, which is particularly rich in trade refuse, Messrs. Baldwin Latham, Frankland, and Perkin are in favour of biological treatment without the use of any chemicals.

With the support of such authorities as these we are encouraged in our opinion that for small or large quantities of any class of sewage biological treatment, pure and simple, compares favourably with any other at present in use.

We look forward with more than usual interest to the next volume of "Specification," and thank you for allowing us to so far trespass on your valuable space.—Yours faithfully,

HENRY OUGH AND SON,
A.M.I.C.E., A.R.I.B.A.

CLEANING WINDOWS.

To the Editor of THE BUILDERS' JOURNAL.

LONDON.

SIR,—Now that the London County Council are seriously contemplating framing by-laws prohibiting the cleaning of windows from the sill on the outside, the suggestions of your correspondent A. E. Goddard, on page 370 of the issue for January 17th, are valuable and opportune, and my object in writing is to accentuate the fact that, if similar regulations are adopted in London as were attempted in Glasgow, the effort would prove equally as futile.

Your correspondent is apparently misinformed as to the nature of the Glasgow by-law dealing with the matter. It came into force, I believe, in 1894; it was not to the effect that no person was to sit or stand on the sill, *but* that no new building would be certified as habitable unless fitted with windows which could be cleaned from the inside of the room.

The result of this regulation was that a great number of devices (some new, but the majority old ones, varied) were put before the public. Most of the ironmongers of any note throughout the city had a patent window, and the office of the master of works (corresponding to our superintending architect) was for months inundated with pattern windows, to enable the Dean of Guild Court to select one which they could recommend. An exhibition was held, prizes offered, and yet with all this the by-law is not enforced, but is a dead letter. The City Trust Corporation themselves practically evade the by-law in many of their new buildings in the vicinity of the Trongate and Salt Market.

The requirements in a reversible window with sliding sashes are:—(*a*) Sashes hung on both sides; (*b*) sound construction; (*c*) so simple in action that an ordinary girl can safely reverse it; (*d*) no complicated parts whatever; (*e*) not likely to get out of order; (*f*) inexpensive.

Now it has been proved that no reversible sashes have been or can be made to satisfy all these demands. The extra cost of what may be termed the Glasgow windows varied from 9d. to about 20s. each opening. The first-named series were miserable makeshifts; the latter were complicated and so expensive as to be prohibitive in ordinary buildings.

The nearest approach to the above requirements is the window with divided stiles; yet this is bad construction, as it is weak and very likely to jamb and get out of order, for if the sash stiles of a window are of the ordinary width (that is, 2¼in. to 2½in.), they are right, both as to strength and appearance. It follows, therefore, that the stile is too weak if it is divided, and if made wider it would be clumsy and obstruct the light; and there are other objections which need not be dealt with now.

The reversible windows, then, judging by past experience, cannot prove a satisfactory remedy, and as to sitting or standing on the sill with protective guards of whatever nature, this is antiquated. An old but unrepealed Act prohibiting such a method of cleaning windows is also a dead letter, for the reason, it may be presumed, of its impracticability.

The remedy, then, to be a success, must be on other lines—namely, a simple apparatus by which a person of ordinary intelligence may clean the outside of the window from the inside of the room, and on the floor level; and, I am informed, that such a contrivance is about to be put before the authorities and the public. An apparatus at a cost of perhaps 10s. that will answer for any number of windows must, on the face of it, be preferable to either the complications and expense of a reversible window at an extra cost of, say, 10s., or the cost and expense of erecting a protective guard sufficiently strong to answer the purpose.

Thus, I conclude that an apparatus for cleaning is the only simple solution of the difficulty, and the old Act has but to be revived and put into force throughout the country and extended to London.—Faithfully yours, A LONDON SURVEYOR.

TILE FIXERS AND BRICKLAYERS.

To the Editor of THE BUILDERS' JOURNAL.

LONDON, S.W.

SIR,—Will you allow me to put before your readers, and trade unionists in particular, our position as tile fixers in the recent disputes with the bricklayers, who have gradually, and of late most persistently, laid claim to tiling (both wall and floor) when it has been straightforward work and in a large enough quantity. They claim the work by saying that the size imitates brickwork, or else that all tiles are bricks, and therefore it is part of their work to fix them, and threaten to strike if tile fixers are allowed to do the work. In many cases the builders, through pressure, have been forced to give way and allow bricklayers to do the work, while the tile fixer, whose trade and only means of livelihood it is (all of whom have been engaged working for years at it, and are thoroughly qualified to undertake all classes of work satisfactorily), are obliged to stand by and see a strong society (by means of its strength) gradually appropriate their trade.

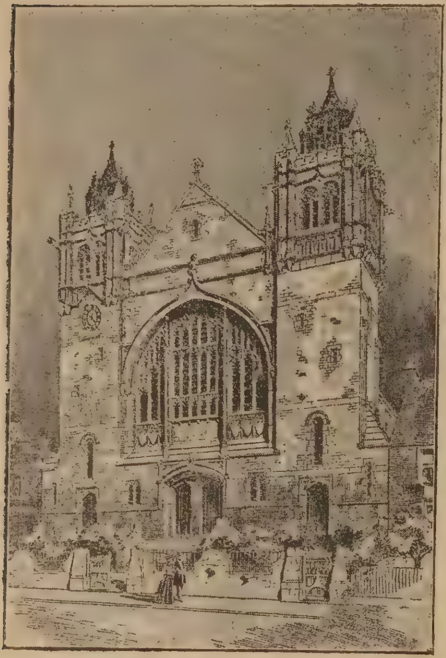
Remonstrances to them have proved useless, and have been treated with contempt, and we therefore appeal to all engaged in the building trade to give us their sympathy and support in upholding our right to what is, and always has been, distinctly tile fixer's work.—Yours faithfully, J. C. CARLEY,

*Secretary of the Amalgamated Society
of Tesselated Tile, Faience and
Mosaic Workers and Fixers.*

A New Branch Library at Armley, Leeds, is to be built at Stocks Hill from designs by Mr. Percy Robinson, of Leeds. The building is in the Renaissance style, and will be of brick, with stone dressings.

Professional Practice.

Bristol.—On Wednesday last the foundation stones of the new Baptist church at Horfield, Bristol, were laid by the Lord Mayor of Bristol (Sir Herbert Ashman). We give below an illustration of the church, which is estimated to cost about £7,000. The design is by Mr. R. Milverton Drake, of the firm of Messrs. Drake and Pizey, and was selected by an independent assessor in a competition amongst local architects. It is in the fifteenth century Gothic style of architecture, the lower portion of the Gloucester Road façade being kept simple and plain, whilst lightness is given to the upper portions of the towers and the bold west window, which is 26ft. in width. The material used is local pennant stone with Monk's Park freestone dressings. As regards the general accommodation, the plan provides for upwards of 1,000 worshippers in the church, whilst there are also spacious classrooms and vestries, the whole to be heated with hot water; particular attention will be paid to the ventilation. Mr. Ridd is the contractor.



NEW BAPTIST CHURCH, HORFIELD, BRISTOL.
R. MILVERTON DRAKE, ARCHITECT.

Dublin.—A new Baptist chapel has been built on the North Circular Road, Phibsborough, Dublin, from designs by Mr. George P. Beater, M.R.I.A.I., of Dublin. Messrs. E. and R. Warren, of Dublin and Blackrock, were the contractors. The chapel is built of red brick, with granite and Portland stone dressings. It is in the Gothic style, and consists of a nave and west aisle, with provision for a gallery at the north end. The building will seat about 300 persons, and is fitted with pitch-pine benches, the windows throughout being glazed with leaded lights of simple design. The roof is of open timber work, and the timber is left its natural colour, and is unvarnished. Exhaust ventilation is by means of a Keirel's patent hydro-pneumatic fan, and the fresh air supply is obtained through hopper ventilators placed about 6ft. above the floor level. In front of the platform is placed the baptistry, which is lined with white enamelled tiles, and behind the building proper, but in communication with it, are the gentlemen's and ladies' rooms, with lavatories, &c. The heating chamber is in the basement, under the vestry, and is fitted with one of Musgrave's hot-air apparatus. The caretaker's house is a separate building, but is on the same plot of ground.

THE "BUILDERS' JOURNAL" SHILLING FUND.

FIRST LIST OF SUBSCRIPTIONS.

Most of our readers are by this time aware of the fact that we have started a Shilling Fund to assist the admirable project that has been set on foot for building a Home of Rest for disabled soldiers as a gift to the nation from the building trades. Full particulars of the scheme were given in our last issue, but for the benefit of any who may not have seen that number we repeat a few details.

Character of the Gift.

The purpose of the gift is to meet as far as possible the needs, which all the patriotic funds hitherto established have to a great extent overlooked, of the permanently disabled soldier discharged from the army with a pension inadequate to supply even the barest necessaries of life. It is proposed to erect and equip six cottage homes containing in all 100 beds, and in selecting inmates for the homes preference will be given to soldiers who have at some time been members of one or other of the building trades.

The homes will be erected on a freehold site at Bisley, generously given by Lord Pirbright. Their management and maintenance will be superintended by a special sub-committee of the Sailors' and Soldiers' Help Society, an excellent institution of which H.M. the Queen is patron.

Methods of Helping.

The Executive of the Building Trades Gift, whose address is 1, Waterloo Place, Pall Mall, S.W., invite offers of gifts in kind; they have issued printed details, giving the exact quantities of materials, fittings, &c., required, and those of our readers who wish to help in this way should write for these particulars.

Obviously, however, there are many thousands connected with the building trades whose gifts could not possibly take that form, and in the hope of enlisting the help of many who would otherwise be left out, we have started a Shilling Fund.

By this means all who are in any way connected with the building trades—architects, architects' assistants, draughtsmen, students, builders, clerks of works, foremen, workmen, and apprentices—will be afforded an opportunity of taking their share in the national gift.

Some Expressions of Opinion.

We have received a number of letters expressing approval of our scheme. Mr. Edwin O. Sachs, chairman of the executive of the national gift writes:—

"I should like to take this opportunity of saying how much I appreciate the gift of the proprietors and the energetic manner in which the matter has been taken up in the Builders' Journal. I am sure you will be delighted to hear how well things are progressing in every direction."

Mr. Sam Waring, one of the stewards representing the donors, writes with reference to our fund: "I should say your suggestion is an admirable one, likely to be taken up with enthusiasm and well supported."

A well-known technical instructor writes: "Allow me to congratulate you upon the Builders' Journal Shilling Fund. I will do my best to assist the fund; please send me a dozen collecting forms, and I will place them in good hands."

A very gratifying communication, the first, we hope, of many similar ones, reaches us from Mr. A. Shearing, builder and sanitary engineer, of Kentish Town, who writes: "I have pleasure in enclosing cheque in aid of the Builders' Journal Fund, subscribed by my employés to-day, including a subscription from myself. I am pleased to add that every hand subscribed most willingly." We feel sure that a similar willingness would be displayed by workmen generally if their employers would set them an example of generosity as Mr. Shearing has done.

The following is a list of subscriptions received up to Monday afternoon:—

		Shillings.
Proprietors of the Builders' Journal		1,000
H. L. Florence, F.R.I.B.A.		200
Howard Chatfield-Clarke		42
S. Hindley		10
T. R.		1
W. Feasey		1
Anon (Ventnor)		1
T. H. Tulloch		1
W. Hartley Patterson		1
L. F. Hansard		1
F. W. Storkdale		1
E. R. Kennedy		1
C. R. S.		1
A. M. P.		1
Thomas W. Senescall		1
Clerk of Works		5
R. R. P.		1
"B. J." Admirer		1
J. C. E. D. (Putney)		1
R. L. P. (Earlsfield)		2½
J. H. B.		2½
W. W.		2½
R. F. G. (Stockwell)		2½
A. B.		2½
A. R. (Stamford Hill)		2½
G. D. (Stamford Hill)		2½
Per A. G. Shearing, builder, Kentish Town:—		
Mr. A. G. Shearing	101	
Mr. H. Cansick	10	
Mr. Learner	5	
Mr. A. Cansick	4	
Mr. Bowen	4	
Mr. Bauer	4	
Mr. Reid	4	
Mr. Poole	2½	
Mr. W. Cansick	2½	
Mr. Edwards	2½	
Mr. Tipper	2½	
Mr. Resin	2½	
Mr. Wakefield	2½	
Mr. Lenfern	2½	
Mr. Lamb	2½	
Mr. Mynott	2½	
Mr. Macgillivray	2½	
Mr. Lewis	2	
Mr. Leo	1	
		160
Per F. H. Cornwell:—		
W. Cornwell	10	
H. T. Desch	5	
E. W. Golding	5	
F. J. W.	1	
W....	1	
E.	1	
T. H.	1	
F. H. C.	6	
		30
Per J. W. Dowdell, Monumental Works, New Road, Buckland:—		
— Simpson	½	
B. Mellish	½	
F. and A. Churcher	1	
B. Miles	½	
W. Songs	½	
F. Newland	½	
J. W. Dowdell	2½	
E. A. Dowdell	1	
A. W. Dowdell	1	
		8
Total		1,486½

In addition to these gifts in money we have received from Messrs. Lander and Co. an offer of some warm air grates; this offer we have passed on to the executive of the gift, who are inviting contributions in kind. Many applications have been received for the collecting forms which we have prepared to enable readers to enlist the help of their friends. We shall be glad to send these forms to any of our readers who will make good use of them.

Contributions, which may be by cheque, postal order, or stamps, should be addressed to—

SOLDIERS' HOMES FUND,
Builders' Journal,
Effingham House,
Arundel Street,
London, W.C.

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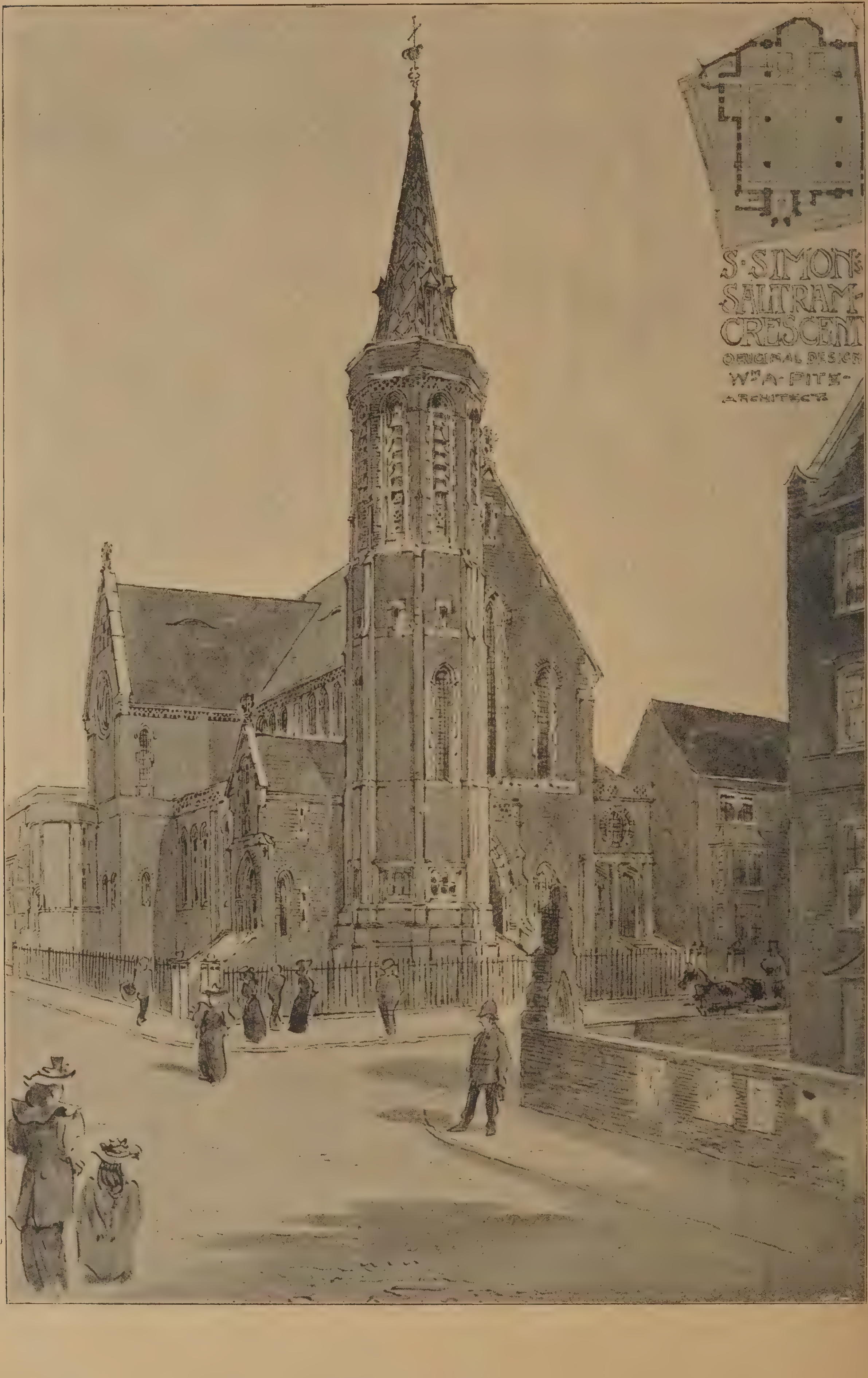

ST. SIMON'S, SALTRAM CRESCENT, PADDINGTON, W. - William A. Pite, F.R.I.B.A., Architect.

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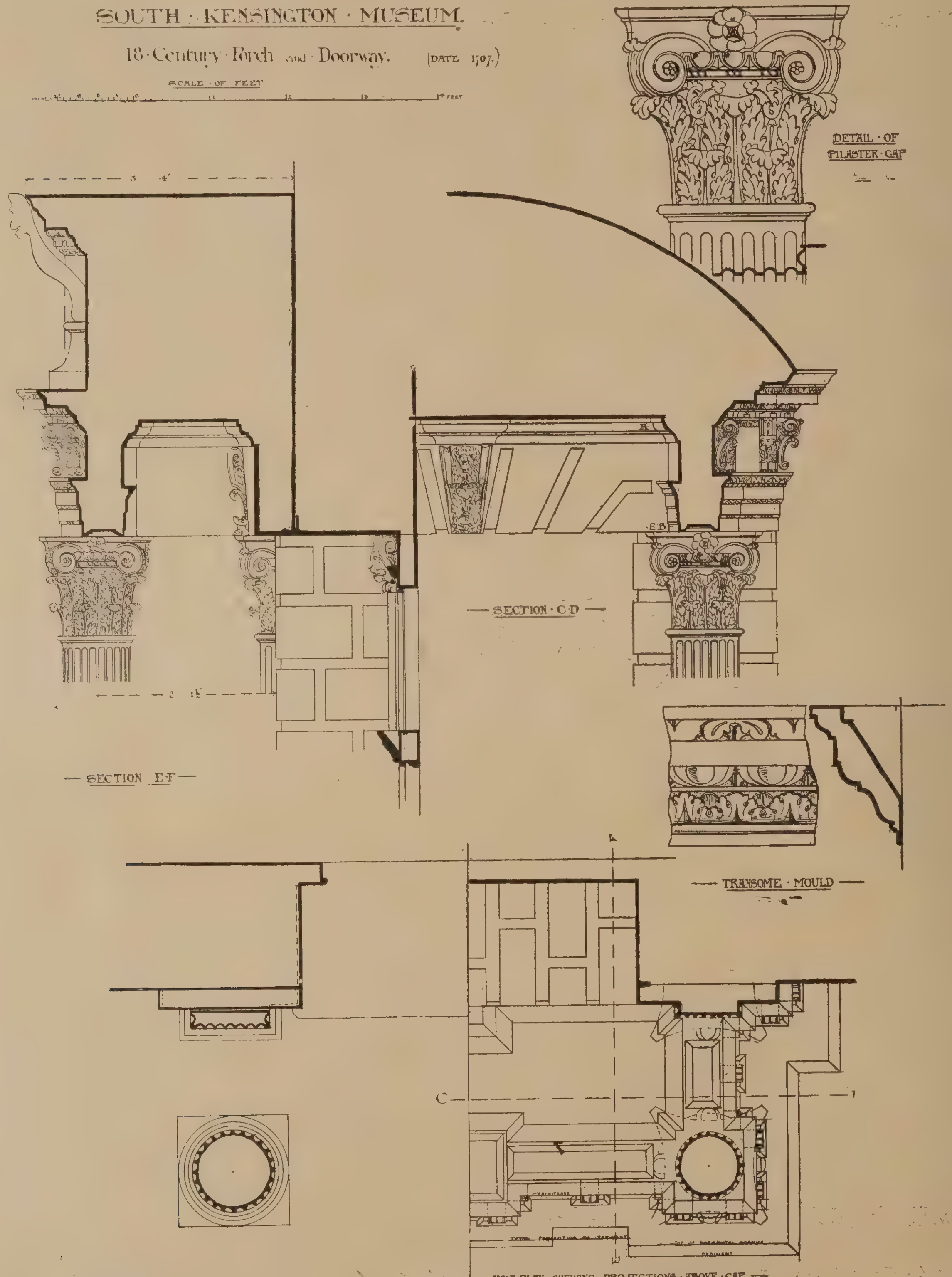
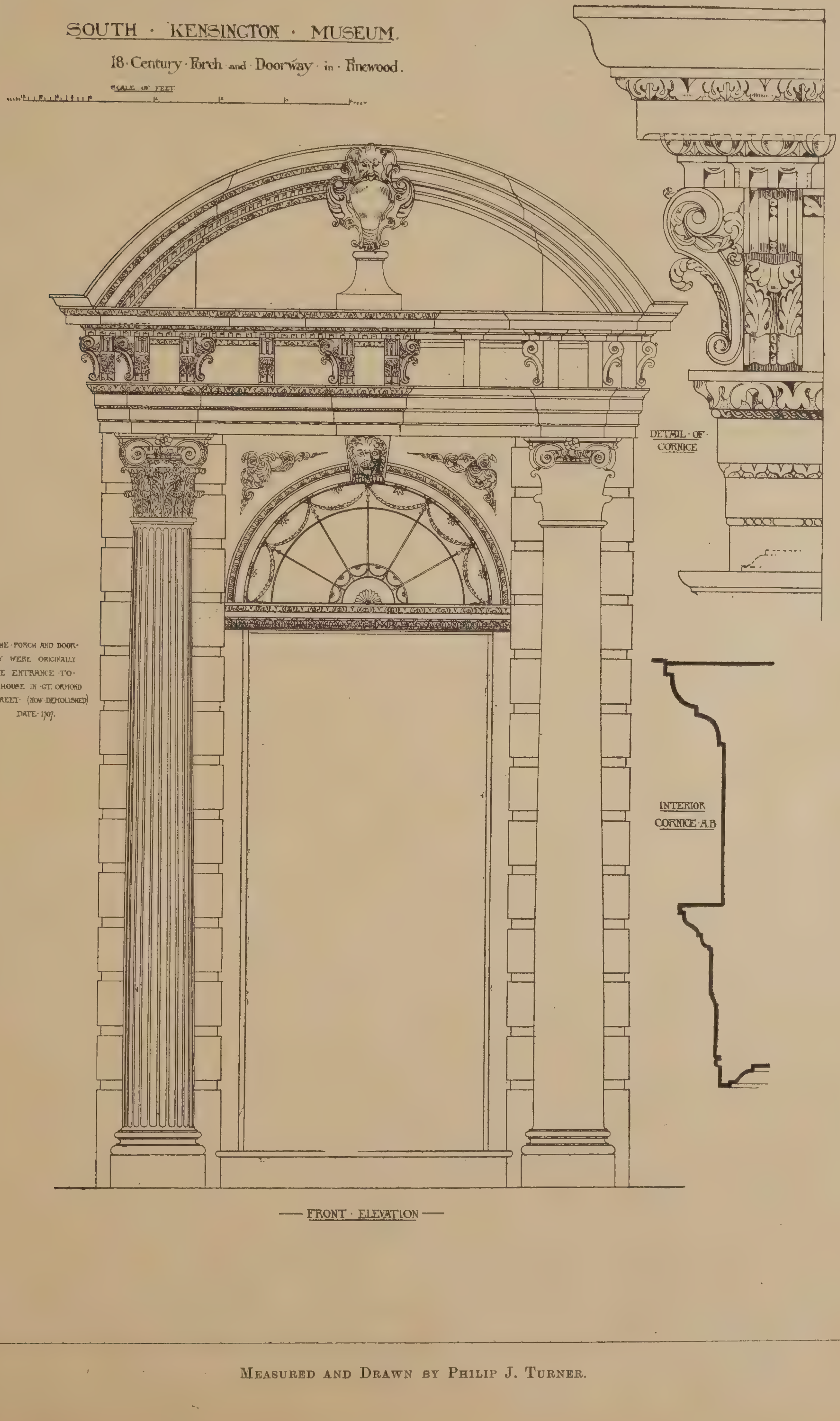
SOUTH · KENSINGTON · MUSEUM.

18 · Century · Porch and · Doorway. (DATE 1707.)



Measured and Drawn by Philip J. Turner.

SUPPLEMENT TO THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD, WEDNESDAY, JANUARY 31, 1906.


SOUTH · KENSINGTON · MUSEUM.
18 · Century · Porch · and · Doorway · in · Pinewood.
SCALE OF FEET.
FEET
THE · PORCH AND DOORWAY WERE ORIGINALLY THE ENTRANCE · TO · A · HOUSE IN · GT. ORMOND STREET · (NOW · DEMOLISHED) DATE · 1707.
DETAIL · OF · CORNICE
INTERIOR CORNICE · A.B
— FRONT · ELEVATION —

Measured and Drawn by Philip J. Turner.

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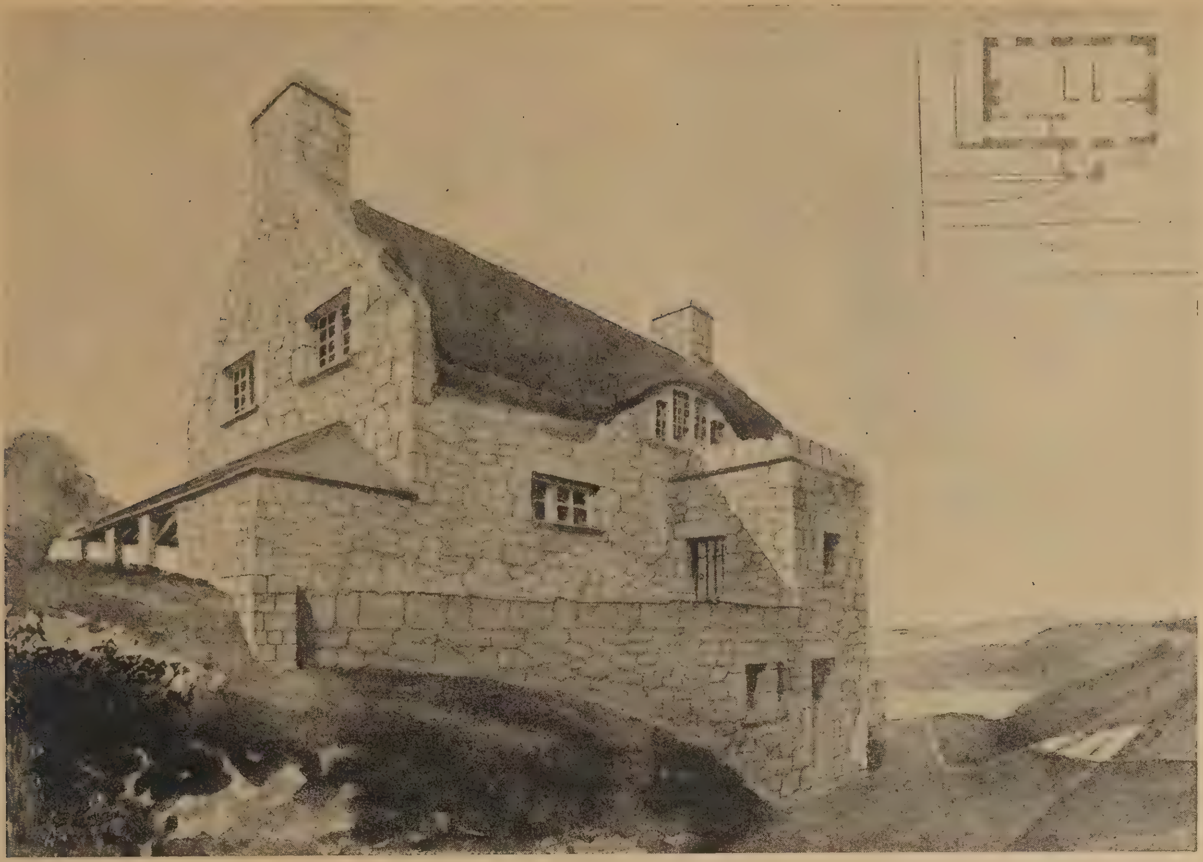
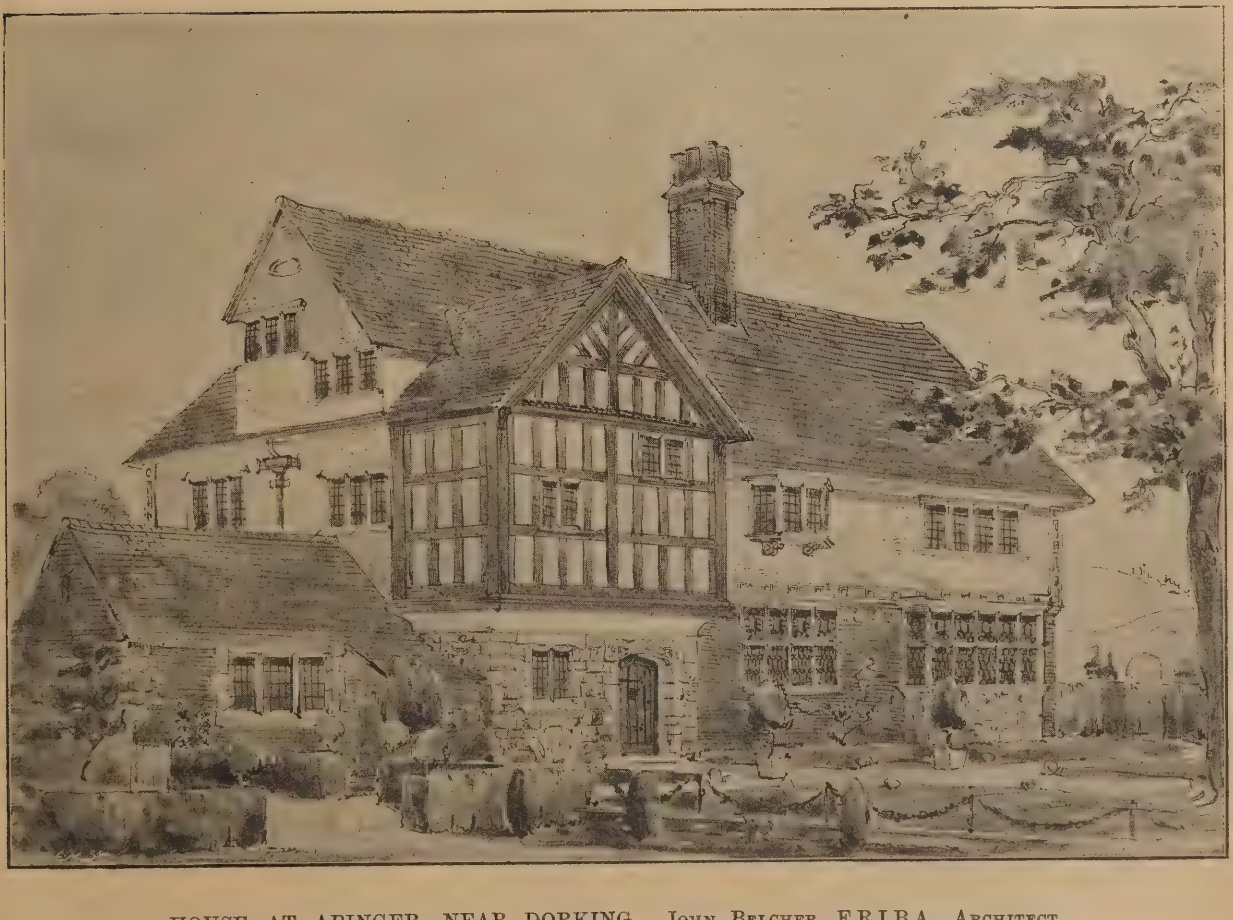


LE CAUDRAY, GUERNSEY. S. Carey Curtis, Architect.



HOUSE AT ABINGER, NEAR DORKING. John Belcher, F.R.I.B.A., Architect.

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Enquiries Answered.

The services of a large staff of experts, including all those engaged on "Specification," are at the disposal of readers who require information on architectural, constructional, or legal matters. Questions should in all cases be addressed to the Editor.

GROINED VAULTS.

Cardiff.—Student writes :—"Is there any book published dealing with constructive masonry, more especially with groined vaults, and how to draw them, as required in the testimonies of study for the R.I.B.A. final examination?"

"Practical Masonry," by William R. Purchase, price 6s., is a good book on the subject. It can be obtained from B. T. Batsford, 94, High Holborn, W.C.

SETTLERS' HOUSES.

Glasgow.—J. D. M. writes :—"Can you tell me of a book dealing with the construction of wood-frame houses as used by colonial pioneers?"

No book has been published on this subject, but "New Cottage Homes and Details," by Messrs. Palliser, architects, U.S.A., price 15s., will supply much useful information. Mr. Batsford will supply it.

FIXING HINGES IN STONE STEPS.

Enfield. — Constant Reader writes :— "Which is the correct way to fix the box of swing hinges into stone steps?"

I have fixed springs in stone landings with Portland cement, with satisfactory results. Sufficient time—say four to eight hours—must be allowed for the cement to set before using the springs. If the landing is thin, and you should cut through, then you must first stick up a slate with plaster of Paris to hold your cement in place. If, however, you cannot use cement, screw down from the floor plate into lead plugs, cutting the holes slightly larger at the bottom, and filling them with molten lead and caulking. G. H. J.

CARRYING UP CHIMNEYS.

Grimsby.—C. E. T. writes :—"By reason of new buildings being taken up higher than the buildings previously existing on a site, the chimneys of the old premises smoke. Is the owner of the new premises legally bound to carry up the old chimney stacks to prevent smoke nuisance, and if such be the case and any settlement is thereby caused to the old premises, who is liable for the damage? The new and old premises are owned by separate parties."

The owner of the new premises is not legally bound to carry up the chimney stacks to prevent the smoke, nor has the owner of the old premises any remedy against him. The very point was decided by the Court of Appeal in the year 1879, in the case of *Bryant* v. *Lefeever*.

DOWN-DRAUGHTS IN CHIMNEYS.

Maidstone.—W. T. W. writes :—"Could you kindly tell me the best remedy for down-draught? I have a chimney stack which contains three flues, ground floor, first floor, and second floor, and in each of the rooms there is a peculiar smell; it seems stronger for about half-an-hour after the fire is lighted, but gradually goes off. One of the flues has a ventilator fixed just below the ceiling line in the room. I should also like to know the simplest book I could get on measuring up work of all kinds."

Before attempting to cure a down-draught it is advisable to find out what causes it, and upon this point the querist's letter sheds no light. Rather, it might be inferred, and with some show of reason, that the trouble complained of arises not from down-draught, but from a sluggish up-draught. When a flue will not "draw" properly upon a fire being lighted at its base, a simple cure, though a somewhat risky one if the flue is foul, is to first light a handful of shavings, or a sheet of newspaper, just above the fireplace immediately before applying a light to the fire. This starts an upward current of warm and lighter air, and usually the moist and smoke-laden air which arises from the kindling of the fuel will follow it. Down-draught is usually the result of a short straight flue, or the "flopping" of the wind down on the flue after contact with some adjacent higher building, but it may arise from a variety of other causes, failing the locating of which it would be advisable to consult some local expert. The simplest work on measuring is Beaton's "Measurer and Estimator," price 1s. 6d. (Crosby, Lockwood and Son).

PERCENTAGES AND PROPERTY VALUATION.

Tunbridge Wells. — X. writes :— "Will you kindly inform me what are the recognised percentages to allow for all outgoings in valuing property. I know the recognised *individual* allowances, but wish to know of a short method to obtain the net rental of property by taking off *one* percentage from the gross rent. If you can give this for different classes of property I shall be very much obliged."

There is no one recognised percentage to be deducted for all outgoings, as very little consideration would show that such could not apply. Outgoings may include repairs, rates, taxes, tithe, insurance, management (or agents' fees), fee-rents, fines, renewals, and a host of other things; or the necessary deductions may be very few and simple. A common deduction for repairs on house property is 10 per cent., being 5 per cent. for internal and 5 per cent. external repairs; but on small residences 12½ per cent. is necessary, and on cottages 15 per cent. or even more. The net can approximately be arrived at from the gross in the case of house property by deducting from the gross :—One-fourth if gross value is under £20; one-fifth if it is over £20 and under £40; and one-sixth if it is £40 and over. The Metropolitan Assessment Committee publish a scale showing the maximum rates of deductions for rating purposes, differing for no less than eleven different classes of property. E. BRAND, P.A.S.I.

ASPHALTE AND CONCRETE ROOFS.

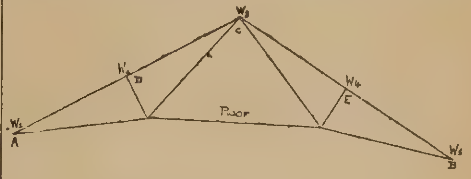
Birmingham.—F. writes :—"It is proposed to construct an asphalte and concrete roof over a corridor 10ft. wide. Steel joists could be supported on the side walls at intervals of 3ft. 6in., but no intermediate support for the concrete is possible. What would be the cheapest, lightest, and most shallow method of construction? Also what is the least bearing necessary for the concrete resting on the flange of joist?"

For cheapness, combined with strength and permanency, use Portland cement as a matrix, and a good local waste, or lye product, as an aggregate, gauged in the proportion of one part of matrix to five parts of aggregate. For lightness use coke breeze or pumice stone as an aggregate. Mix the matrix and aggregate thoroughly together in a dry state, then add just sufficient water to render the mass stiff but plastic, and then incorporate the whole by rapid and regular mixing, and gauging by the aid of a drag or "larry." Lay this stiff concrete as soon as gauged on the centering in layers about 3in. thick, and well ram and beat each layer until flush with the tops of the joists. For a shallow floor, fix wood centering against the lower surface of the joists, and after the concrete has been laid and set strike the centering, and set the whole ceiling surface with gauged putty, lime and plaster, or with one of the white and quick-setting cements which are manufactured in Birmingham. The upper or floor surface may be finished with a fine Portland cement concrete instead of asphalte. If the fine concrete is laid while the rough concrete is green, the whole would be one consolidated and impervious body. With regard to the least bearing for the concrete on the flanges of joists, a bearing of 1in. would be sufficient for joists 3ft. 6in. apart. Unless open spaces or channels at the sides of the joists are required for some special purpose, allow the concrete to take the full bearing on the flanges and sides of the joists, which will strengthen not only the joists, but also the roof, and also reduce the cost of construction. If open spaces at the sides of the flanges are required, lay hollow cast concrete blocks along the sides of the joists before the concrete is laid. This method would reduce the cost, and increase the general strength of the work.

W. MILLAR.

STRESSES IN ROOF.

Neath.—F. S. J. writes :—"Kindly state which method for obtaining strains in roof members is correct. Fig. 1 is from Rivington's and Fig. 2 from Wilson's 'Building Construction.' The base line XY in both represents the total weight, and as the construction in Fig. 1 starts from the extremities, and in Fig. 2 from points nearer the centre, it stands to reason that the same result cannot be obtained by both."



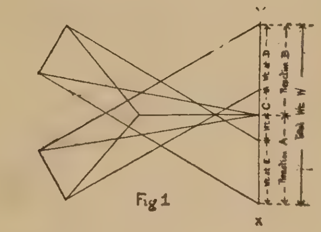


Fig 1

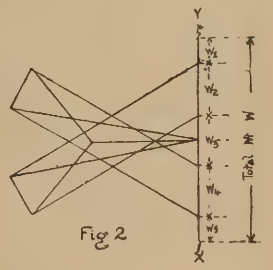


Fig 2

Both results are correct for the conditions given, but in "Notes in Building Construction," Vol. IV., Plate 3, Figs. 356-7, the external load acting at foot of principal rafters, not passing through the truss members, is omitted. In Wilson's illustration this load appears, as it should do, in both frame and stress diagram.

HENRY ADAMS.

Mr. William Edwards Tirebuck, of Liverpool, died last week. Among other books, he wrote "Dante G. Rossetti; his Work and Influence," "Great Minds in Art," and "William Daniels, Artist."

New Workhouse for Hunslet, Leeds.—Three years ago the Hunslet Guardians spent several thousand pounds in building and equipping at Rothwell Haigh a series of cottage homes for poor children; in a week or so the new offices erected in Glasshouse Street, at a cost of £2,500, will be ready for occupation; and tenders are now invited for a new Union workhouse, estimated to cost £60,000. The site is at Rothwell Haigh, some distance from the children's homes, and the buildings will be on the pavilion system, comprising receiving wards, tramp wards (on the cell principle), administrative block, residence, committee and work rooms, dining hall, and stores. Altogether, provision will be made for between 400 and 500 inmates. Mr. J. H. Morton, of South Shields, is the architect.

Bricks and Mortar.

APHORISM FOR THE WEEK.

"There is a time in every man's education when he arrives at the conviction that envy is ignorance; that imitation is suicide; that he must take himself for better, for worse, as his portion; that though the wide universe is full of good, no kernel of nourishing corn can come to him but through his toil bestowed on that plot of ground which is given to him to till."—EMERSON.

The Cates Competition. THE following are the conditions for the competition for the Paris Exhibition Prize, 1900, offered by Mr. Arthur Cates:—Candidates to be members of the Architectural Association, without limit as to age; to have passed the R.I.B.A. final examination, or to have passed the intermediate examination; and also to submit drawings equivalent to the testimonies of study required to be sent in for the final examination. To also submit practical working drawings and some brief descriptive reports of a technical character, satisfactory evidence of ability in architectural and constructive design, with good, accurate draughtsmanship, being essential. Application, with drawings, &c., to be sent in to the honorary secretaries at 56, Great Marlborough Street, W., not later than April 30th next. The examination to determine the award of the prize to be partly written and partly oral, and conducted by gentlemen appointed by the committee. The subjects will be:—(a) French, as written and spoken; (b) technical French, as used in relation to architecture and building; (c) the metrical system, and its application to architecture, building plans, surveys, and accounts; (d) general knowledge of architecture, if thought necessary by the examiners. The examiners will have full power to award the prize or not, as they may think fit. The successful candidate will be required to spend not less than four weeks in Paris to study, examine, and report on the architecture and buildings of the Exhibition, and must, on or before December 22nd next, deliver to the honorary secretaries an accompanying illustrated descriptive report. The successful student will receive £20, to be paid in two instalments, the first on his leaving England, and the second on his submitting the illustrated report to the satisfaction of the committee of the Architectural Association. He may be required to read a paper before the Architectural Association on the subject of his study. The illustrated report, or a complete copy, to be presented to the Architectural Association, who shall have the right to publish the whole or any part in "Architectural Association Notes."

The Late Thomas Collins. IN reference to the late Mr. Thomas Collins, whose death we recorded in a recent issue, a well-known architect who knew him well, writes:—"In the late Thomas Collins, head of the firm of Collins and Godfrey, of Tewkesbury, the building trade has lost one of the most honourable and high-minded men that ever adorned it. He rose from small beginnings to his eminent position not only or mainly by industry and ability, though he had plenty of both, nor certainly by attention to his own interests, of which he thought very little, but by force of character. His rule over his foremen and other employees was patriarchal. He knew them not as 'hands,' but as men, and his kindly shrewdness taught him how to pick them. If an architect complained, he took the blame himself and never blamed others; but afterwards, 'when the old gentleman was displeased,' the right people knew of it. The short, thick-set figure, the massive head and broad homely face, with blue eyes very far apart, the old-fashioned courtesy of his manner, and the humour and kindliness of his talk made up a personality not to be forgotten. His work is well known and wide spread. This note is only of the man himself—the 'candida anima' of his profession."

Enamel Painting. THE foundation of a painting in enamel, said Professor Herkomer during a recent lecture at Burlington House, is copper. For his part he did not believe in convex plates. It seemed to him essential that for pictorial purposes the plate should be as nearly flat as possible, and most of his later enamels were practically flat. The lecturer then explained the use of the wooden blocks on the table. The copper plates were cleaned on them, before commencing to paint, with the aid of an engraver's flannel "dolly" and emery powder. The old plan was to use acid, but he did not like it. The absolute cleanliness of the copper was, however, essential—the least fraction of grit or finger-marks might ruin the plate. The next thing was to cover the plate with the first flux, and the lecturer gave elaborate directions for preparing the enamel powder by grinding it in an agate mortar, and subsequently washing it many times to get rid of the milky impurities which, if allowed to remain, would make the colour muddy and dirty. The method of applying the enamel powder to the back and front of the plates was then described. The back was not so important, but the spreading of the coating on the front required great care. The plate was now ready for drying and firing, and the uses of the muffle, of the high stove, and of an ingenious screen of glass and asbestos designed by the lecturer, were now made clear. The time occupied in firing had to be judged from feeling and experience—science could not measure it. Through the asbestos and glass screen you could peep at your work now and again, and when done the plate should have a certain brassy, salmony appearance. When cool, the plate was ready for the tracing of the design on it with carbon paper—a design which should have been made beforehand with the greatest possible care. "To every painter," said the lecturer in conclusion, "comes a disappointing moment in the middle period of his career—a moment when he begins to feel the limitations of his art. A change of some sort is wanted, and at this time painting in enamel will serve a man if it suits him. It is emphatically work for an artist's middle period."

The Origin of Granite. AT a recent meeting of the Manchester Literary and Philosophical Society, Mr. C. E. Stromeyer, M.I.C.E., attempted to explain the apparent paradox, noticed in granite and similar rocks, that the felspars, hornblendes, &c., must have crystallised before the quartz which surrounds them, although the melting temperature of quartz is much higher than that of the other minerals, the difference being as great as that between the melting temperatures of lead and ice. The author suggests a possible method of freezing, say, water or felspar while the one is in contact with molten lead and the other with molten quartz, one of the most infusible substances known. The rate at which the earth's temperature increases the deeper one penetrates into it is fairly well known, from which it is estimated that at depths of from 50,000ft. to 200,000ft. the melting temperature of both quartz and felspar will have been reached; but at these depths the earth's pressure exceeds even that in gun barrels caused by the explosion of powder. This enormous pressure must produce a considerable change of melting temperature in the minerals of granite, and the author suggests that certain experiments, which he indicates, should be made to determine the amount of change.

Chances of Fire at the Louvre. THERE exists at present in a wing of the renowned Louvre at Paris an appreciable risk of fire. Everybody recognises the danger, the authorities as well as the public. Owing to a lack of space (and funds) it has been found expedient to house the Ministry of the Colonies in a wing called the Pavillon de Flore. Governmental departments of all kinds enjoy a reputation for collecting huge bundles and stacks of official papers, and in France this matter is carried to an abnormal extent; so that at the present time the Colonial offices are packed from floor to ceiling with inflammable material. To make matters still worse, stoves are provided for heating purposes, and the pipes from these run over the wooden partitions which have been erected to divide up the different rooms. All that is needed is a spark, or the flues to become overheated, either of which is equally feasible. Then, as soon as the Pavillon de Flore was well alight, very great difficulty indeed would be experienced in preventing the outbreak spreading to the Louvre proper, which is an old and inflammable building. It need hardly be pointed out that such a policy as this is a most wrongful one, and it is to be hoped that better councils will prevail, and other accommodation will be found for the Ministry of the Colonies, in order that a present danger to those inestimable art treasures at the Louvre may be removed.

The Basilica Emilia. MANY discoveries are being made by the excavations of the Basilica Emilia at Rome. Penetrating from its southern porticoes into the central area, or nave, it has been found that in the third century, owing to some disastrous fire or collapse, the dividing wall had to be entirely rebuilt with brick and coated with marble; except towards the eastern extremity of the building, where the tufa walls of the Augustan Basilica have survived to some considerable extent. Tons upon tons of "Africano" marble (the remains of columns) have been brought out by the workmen; but not even a chip of the Phrygian (or pavonazzetto) marble, which, according to Pliny so impressively adorned it. These third century drastic restorations naturally suggest that the interior of the building must have suffered in such a manner as to have included the destruction of the Phrygian columns. The pavement of the central hall, or nave, is composed of slabs of "bigio" and "Africano," but the most important evidence regarding the basilica is that with regard to its size. Instead of proving to be anything like the limited edifice represented in well-known topographical works, it is manifest that it was no less than 300ft. in length, that is only 35ft. less than its great rival the Basilica Julia.

Our Inset Sheets. THE eighteenth century porch and doorway is seen in South Kensington Museum, and is placed at the end of the English furniture. It originally formed the entrance to a house (now demolished) in Great Ormond Street. The porch is dated 1707, and is executed in pinewood; the fanlight over the door being formed in lead. The Museum authorities know nothing further of its history. The illustrations are from measured drawings by Mr. Philip J. Turner, of 112, High Road, Chiswick, W. The perspective of St. Simon's Church, Saltram Crescent, Paddington, W., is one of a competition set, submitted by Mr. William A. Pite, F.R.I.B.A., of 3, Upper Montague Street, W.C., and placed first. The site was difficult and hampered by its restricted boundaries, but this has since been obviated by an advantageous enlargement. The materials were to be red brick and stone, and the bell turret is surmounted by a lead spire. Le Caudray is situated on a headland in Guernsey, overlooking the wild scenery of Rocquaine and the Hanois. It is built of blue axe-faced granite throughout, with sanded red tile roof, and contains a large hall, dining and sitting rooms, five bedrooms, and usual offices. It was entirely built by direct labour, as, owing to the distance from the town, no contracter was willing to undertake the work. Mr. S. Carey Curtis, of Kensington, W., was the architect. The house (erected for a Mr. Ledward) at Abinger, near Dorking, was designed by Mr. John Belcher, and is built partly of local ironstone, red brick, and half-timber work and plaster.

LEGAL NOTES FOR ARCHITECTS AND SURVEYORS.*

By ALGERNON BARKER, B.A.,
BARRISTER-AT-LAW.

THERE is a proverb which is somewhat uncomplimentary to the man who acts as his own lawyer. I venture to think, however, that a knowledge of the law may be of considerable use to a layman in preventing him, when he is on the edge of a legal precipice, from acting as his own lawyer, and in helping him to act wisely when his solicitor has left his office and gone home.

The man who would conceive and plan the buildings which act as the temples of our commerce or the nucleus of our home life, or form the outward expression of our religious devotion, meets with many difficulties. There are the brute forces of Nature—the wind which makes his Tudor chimneys smoke, or, still worse, blows them down, or the frost which lays its injunction on him during the winter. Worse still, there are jealous neighbours who allege that he is encroaching on their fields, or wrongfully leaning against their buildings, or darkening their ancient lights. Then he may have to keep a wary eye on the builder, to see that the building contract is duly carried out. Again, there are the local authorities, armed by Parliament with extensive powers in the hope that they will use them wisely, and it is with the powers of these authorities that I now propose to deal with. The law I wish to lay down must, however, be taken with this qualification, that it does not necessarily apply to the metropolis or to Scotland.

The statutes that concern us speak of "buildings" and of "houses," and it would be well at the outset to ascertain what these words mean. In construing a word you must take it in its ordinary and popular sense, unless you gather from a perusal of the whole Act that it is to be otherwise understood. Further, so far as possible, without straining the language of the Act, you must carry out its intention. This intention must be gathered from the words of the statute itself, the whole of it being duly considered.

The Meaning of "Building."

First as to "building." This word occurs in two kinds of provisions, and its meaning varies according to which of these two provisions contains it. It occurs in provisions for the benefit of the public generally and in provisions for the health and safety of inmates of buildings. I must emphasise the chameleon-like nature of this, and indeed of all words. It is of little use to search through cases as to inspecting dilapidations, or as to voters' qualifications, in order to ascertain the meaning of this word.

In provisions for the benefit of the public the word "building" must be taken to include any structure, whatever its material, if only it is large enough, and is intended to be permanent; thus a wall 15ft. high is a "building" in breach of an obligation not to build within so many feet of the footpath, and a huge wooden trellis is a breach of a covenant against putting a "building" in a yard. If, however, the size is not great the erection will not be a "building"; *e.g.*, a small conservatory 4½ft. by 2½ft. was permitted to project in front of the line of buildings, and in another case a small railing; and it was held that a wall 5ft. high was not a breach of covenant against building within so many feet of the footpath, as it was about the height that would be necessary to secure privacy against pedestrians. I have quoted several cases of covenants, but the principle is the same. As to the necessity for permanence, the case with regard to the huge wooden trellis above alluded to may with advantage be examined. Common sense tells us that in order to carry out the purposes of these restrictive covenants, or of statutes forbidding "buildings" in certain places, a wall must be included, for it would be almost as objectionable if it broke the vista of our streets or encroached on our public parks, or on our highways, as would any other building.

Very different, however, is the meaning of the word "building" when it is found in provisions for the health and safety of inmates. A "building" in these provisions requires size and permanence, as it did in the former class of provisions, and thus your builder's shanty, intended to be removed when the new terrace you are putting up is completed, does not come under the term "building." One other condition, however, is requisite, and that is capacity. To use more homely language, it must be something a man could get into and move about in, and must have a roof to shelter him. But if these conditions are present, it matters not that the house is uninhabitable. It may have no fireplace, no chimneys, and no foundation. It may be of any material. It may have wheels, if it is used for the purposes that buildings are used for. Thus, night houses for cattle and coach-houses have been held to be "buildings" for the purpose of these provisions, but not a boiler standing on a base of bricks 4ft. high.

The Meaning of "House."

Next, as to the meaning of the word "house." This word does not occur in provisions for the benefit of the public, but it is frequently found in the other class, provisions for the health and safety of inmates. It requires the three conditions of size, permanence, and capacity mentioned above, but adds to them one other, that is, habitability, though this may be absent if the word comes under the interpretation clause mentioned below. Thus, it includes an unconsecrated chapel which was inhabited by a caretaker, and the whole of which could have been inhabited without any structural alterations. Conversely, nothing that is uninhabitable, unless it comes under the interpretation clause, can be a "house." This lack of habitability may arise from two causes—from structural defect in the absence of such things as a fireplace, windows, or doors, or from the legal bar to using the structure for purposes of habitation, which results from consecration, as in the case of a church, which has been held not to be a "house" in this connection. Thus, we must exclude such opposites as a cowhouse and a church. We must, however, in accordance with the interpretation clause of the Public Health Act, as modified by later Acts, include "schools, factories, and buildings where persons are employed." Thus, taking what I may call the common law and the statutory definitions together, you might, I think, include schools, factories, offices, shops, warehouses, theatres, and all premises where a caretaker sleeps.

When the word "dwelling-house" is found in the Acts we deal with, it seems to mean a house of which the main purpose is residence. The mere fact that a caretaker resides on the premises, such as a chapel or warehouse, would not of itself be sufficient to make them a "dwelling-house." Before leaving this part of my subject, I may mention that the interpretation of the meaning of words contained in a statute is a matter of law, but the question as to whether any particular subject matter with which you may have to deal comes within the definition of any word so interpreted is a question of fact.

Your first question in considering the rules which I desire to lay down will be, "What am I building?" Some of the provisions that we shall consider apply, as we have seen, to "building" in the most comprehensive sense; others to "buildings" in the narrower sense, excluding, as I may remind you, anything without a roof; others apply to "houses" and all the other premises by judicial decision or by interpretation clause comprised in that word. Others, again, apply to particular kinds of premises, to dwelling-houses, to common lodgings, to cellar dwellings, to factories and workshops, to bakehouses, to dairies, or to schools.

Another question in considering the rules hereafter mentioned will be, "Where am I building?" or, to be more practical, "is it within the jurisdiction of an urban or a rural district council?" Much will depend on the answer to this question, so widely do the powers of these councils differ.

The differences between the town or city council and an urban district council is not great. The dignity of the former may be wanting to the latter, but so far as the provisions which affect the man who builds are concerned there is little or no real difference. Very different, however, are the powers of an urban district council from those of its humbler rural brother.

An urban district council can, by the Public Health Act, set back a building the front of which you are completely restoring, and can under another statute punish you for building beyond the house on either side of you. It can prevent you from building upon its sewers or under its carriageways. It can forbid you to build a house without a drain. Then again, by adopting the Public Health Act Amendment Act, it can gain further exclusive powers. It can forbid a room over a cesspool, ashpit, or privy to be inhabited. It can permit you to substitute an ashtub for the ashpit. It can see to the substantial construction of and sufficient ingress into and egress from places of public resort, and also to the safety of grand stands and similar erections. Again, an urban council has power to make the by-laws authorised by section 157 of the Public Health Act of 1875. And, if the Public Health Act Amendment Act is adopted, it can make by-laws as to paving of yards and open spaces round dwelling-houses and as to providing secondary means of access to ashpits and similar places for the purpose of removing house refuse.

The country cousin has none of these powers unless it obtains them from the Local Government Board. One luxury, however, the rural district council has all to itself. By the Public Health (Water) Act, section 6, it can punish the man who builds a "dwelling-house" without first obtaining a certificate that there is a water supply at a reasonable distance from it. Here again, however, the Local Government Board may step in and give this power to an urban authority at their request.

A second time again it will be well to ask yourselves, "Where and under what statutes am I building? Has the council adopted the Public Health Act Amendment Act? Is there any local Act or by-laws that may concern me? Who am I building for? Is their a special Act or are there special powers or restrictions in any Act which may enlarge or curtail my liberty?"

There are the public general statutes, such as the Public Health Act, 1875, the Public Health (Water) Act, 1878, the Public Health (Buildings in Streets) Act, 1888, the Factory Acts, the Chimney Sweepers' Act, 1840, and the numerous Acts as to town gardens, commons, and open spaces.

Then we may have to deal with an adoptive Act, the Public Health Act Amendment Act, which, until it is adopted by a district, has no more force of law in any district than some incipient Bill in Parliament. With the formalities precedent to adoption I will not trouble you. The urban council cannot pick and choose which of the sanitary provisions in Part 3 of the Amendment Act they will adopt. They must take all or none. Rural councils stand in the same position as to those provisions which they can adopt without leave of the Local Government Board, but where they need this leave they do gain a power of choice, as the Local Government Board only gives them such powers as they ask for.

Then there may be the local Acts, the contents of which are so various that I cannot deal with them here. They must, however, be carefully read as they may, with regard to the place in which you are building, utterly upset any of the law laid down in this paper. I cannot too strongly emphasise this fact. In these local Acts are usually incorporated the whole or parts of the Towns Improvements Clauses Act. Then, again, there may be by-laws, which we shall consider later on. Or, again, the education code for the time being, which has the force of law, may have much to say to the architect who is building a board school, and the Education Acts may enable him to defy the Public Health Act or similar Acts in certain respects. Or, if you are building for a railway company, there will be the special Acts laying down, it may be, further restrictions or enabling you to escape from those which apply to buildings in general. I will not enter into the questions which arise when these Acts, or when sections of Acts, or when a by-law and a statute seem to conflict. I hope to consider this matter more fully in a pamphlet which I propose to publish.

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* A paper read before the Northern Architectural Association on January 17th.

Provisions.

The first class of negative provision for the benefit of the public is that which regulates the vista of our streets, either in accordance with a "prescribed line" under the Public Health Act, or through a "governing building" (a term which I will explain) under the Public Health (Buildings in Streets) Act. These methods differ in several important respects. The first deals only with "buildings or the fronts thereof taken down to be rebuilt or altered," and not with buildings being erected where none stood before. The second deals with new buildings, or new additions in front of, or on the top of, old buildings. In the first the line of buildings is the general line of all the houses in the same street, but depends for its very existence on its being prescribed by the Urban Authority. In the second it is not the general line of buildings at all which regulates, but merely the most backward next-door neighbour, called the "governing house," no prescribing being necessary, but consent to build forward being required. The first, the prescribing method, gives compensation and exacts no penalty, but is enforcible by the ordinary methods of injunction and indictment. The second exacts a penalty which can only be recovered before Justices of the Peace. In the case of the prescribing method, an offending building must be pulled down by the defendant if the High Court make an order to that effect. In the second, the building which projects beyond its most backward neighbour cannot be pulled down at all.

Let us consider the first or "prescribing" method under section 155 of the Public Health Act, 1875. This enacts that, "where any building or the front thereof in any street has been taken down to be rebuilt or altered the Urban Authority may prescribe the line in which" its successor "in the same situation" is to stand, and the successor (as I may call it) shall be erected in accordance with such prescription. Compensation is to be paid or tendered to the owner, the amount to be ascertained if necessary by arbitration in the usual manner. Short though this section is, almost every word of it has been a text for judicial interpretation and a cause of innumerable disputes. You may ask, "Is my structure a 'building' so as to be set back?" The answer is, "Even if your structure were only a wall 15ft. high or a cowhouse, back it must go if it is large enough and is intended to be permanent."

Then, again, you may question whether it is in a "street" for the purposes of this section of the Act. Well, if there are houses more or less continuous along one or both sides of your road, and that road is used for public carriage traffic, it is a "street;" thus, Claremont Road (Newcastle) is a "street," though on one side stretches the breezy town moor. A mere foot passage with houses on either side, such as we see in Durham or in other quaint old cathedral towns, will not be a "street," and I think, though the matter has not been clearly decided, that the road must be one which has been dedicated to the public, that is, it must be a public carriageway. My reason for this opinion is that the provisions as to the building line are provisions for the benefit of the public, and, therefore, the authority would seem to have as little right to regulate the vista of a private street as it has to choose the pattern of your drawing-room carpet.

Some Illustrated Examples.

One more question. Suppose that, as shown in Fig. 1, there lies in front of your terrace a footway, and in front of the footway a common garden extending the whole length of the terrace. Will the terrace be in the street? On the whole I am inclined to think, having regard to decided cases, that this will depend on what openings there are from the common garden into the street, and also as to whether or not the footway is public; the more nearly the terrace with common garden is assimilated to the ordinary case of houses with separate gardens opening into the street, the more likely is such terrace to be held to be in the street. An increase of the assessibility of the common garden into the street would have this effect.

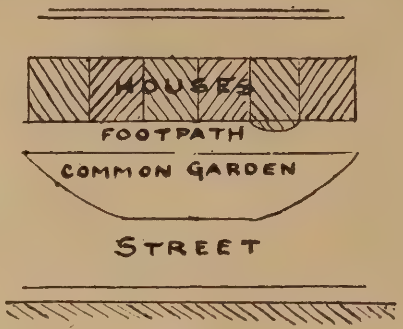

FIG. 1.

Another question, however, which has been decided by numerous cases, may arise for your consideration. You are engaged on a corner house (see Fig. 2). On one side, facing the aristocratic street, the front door is situated, while on the other side is a door for tradesmen. Is the corner house in the latter street also? There is no doubt that it can be, and probably is, but this will be to some extent a question of fact.

Then, again, what is the meaning of "taken down in order to be rebuilt and altered"? It means substantially taken down. A case which may be useful in explaining this is the case of the *Attorney General* v. *Hatch*. In this case the owner of a baker's shop, which projected beyond the building line, wished to turn it into a two-storey windowed milliner's shop. He accordingly took out the fronts of the ground and first floors, but left undisturbed the second storey, shoring it up first with wooden beams and later with iron girders. The urban authority came with their compensation money in their hands, but the owner was not to be tempted, so an action was commenced against him. In this it was held that in order to bring a building under the provisions as to the prescribed line, the front of such building must have been completely pulled down (that is, as far as the foundations), though a few bricks of the front left standing would not save the owner. Conversely, in another case it was held that a building the front of which was left up as far as the first floor cannot be prescribed for, as its front has not been pulled down.

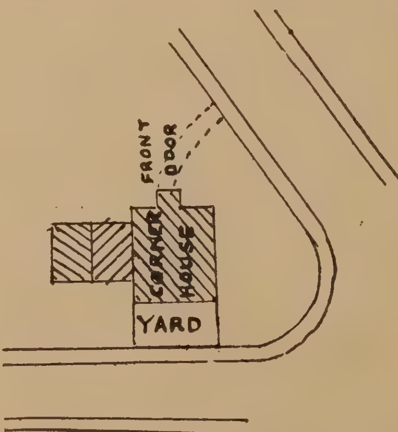

FIG. 2.

Therefore, if you want to keep your own position in a street, do not be in too great a hurry to pull down your building. Supposing you have an ugly yellow brick house which is fast going to decay, but which, on account of its forward position, commands an interesting view up and down the street and covers valuable ground. You wish to turn this into a "marble hall." You can, if you like, pull down the front all at once, in which case you will lose your position in the street. Or you can pull out the bottom part of the front and put in your marble, meanwhile shoring up the higher storeys, and then restore the higher storeys until the whole building has a new front; or you may begin on the top storey. A local authority who tried to fix you with a prescribed line would be in this dilemma. You could always say, "I have not pulled it down, it is too early to prescribe;" and also, at the same time, "I have begun to build it up; it is too late to prescribe."

Another question: Suppose you have two semi-detached houses and you pull the front of one down. Have you pulled down a whole front, or only half a front? Well, if the houses were separately occupied, and had no internal means of communication, you have pulled down a whole front and the authority may prescribe for the front that you pull down. But if you have pulled down the front wall of your house it will not avail you that you have left the rest of the building standing. Suppose, however, that you have pulled down the whole front extending, say, a foot back, can the authority prescribe a line a yard back? No, I think, certainly not. Their line cannot go back further than the site you have just vacated.

The Meanings of "Prescribing" and "Line."

Now we come to the meaning of the word "prescribing." If a surveyor authorised by the council comes along the road and points with his stick, or paces out the line, saying, "Thus far and no further shalt thou go," has he prescribed, or must he send for pen, ink and paper? He has duly prescribed and need not do so in writing. The authorities, however, must prescribe a line particularly in each case. They cannot do so by a general notice or by by-laws, though they may possibly be able, in certain special circumstances, to obtain much the same effect by by-laws as to new streets and air spaces, as we shall see.

Next, as to the word "line." It should hardly be necessary for a lawyer to teach you how to draw a line, but there is some law in this matter. In *Tear*, or *Sear*, or *Fear* v. *Freebody* (no one seems to know the plaintiff's name) the only decision as a matter of law with regard to the meaning of the word "line" was that it need not be a mathematical or geometrical line; but the case is in other ways instructive The facts were as follows:—Portland Road, see Fig. 3, ran from east to west, and had a 6ft. footway and a 28ft. carriageway. At the extreme east, on the north side of the street, was a house which plaintiff was building flush with the footpath; then adjoining it, followed, going westwards, a row of nine houses called Priory Terrace. This row stood back 11ft. or 12ft. Of these houses the first two were forward, the next five back, the last two again forward. The forward houses projected beyond the backward houses by 9in. Then came a gap of 4ft. and then two houses called "boundary cottages," standing back some 11ft. or 12ft.; then another gap of 4ft. followed by Portland Terrace, the houses in which also stood back 11ft. or 12ft. This last terrace consisted of twelve houses. The first, a wider house, standing forward; the second, a narrower house, also standing forward; then came three narrower houses, standing back; then two narrower houses, standing forward; then three narrower houses again standing back; then a narrower house, standing forward; then a wider house, also standing forward. The difference between the backward and the forward houses was 9in. The backward houses of Priory Terrace and Portland Terrace stood at the same distance back from the pathway and so did the forward houses. You thus see these buildings made quite a pretty design. The arbitrator found that each row, namely, Priory Terrace, Boundary Cottages, and Portland Terrace, had

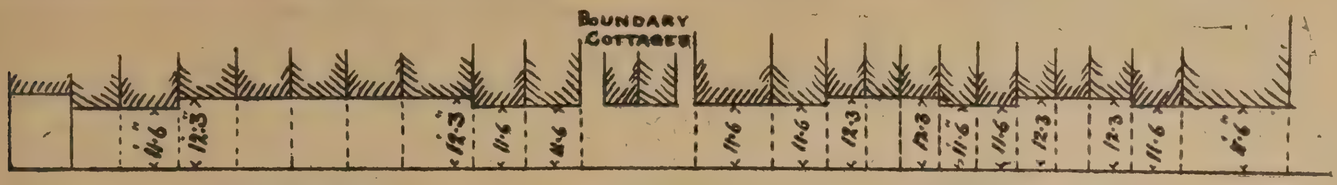

Fig. 3.—Portland Road.

a line of buildings, and also that all these rows taken together had one general line of buildings. These were the circumstances in which the judges decided that the line of buildings need not be a mathematical one. The judge also said that the object of the provisions as to line of buildings was to secure the ornamental character of the street. The Court evidently approved of the arbitrators finding. I may, however, remark two things. It was not necessary for the case that all three rows should have one line of buildings. It was sufficient that Priory Terrace, which was next to plaintiff's house, should have a general line. Secondly, the question whether houses have a line is a question of fact.

Another rather curious case. A owned a pair of semi-detached houses, and pulled one down; to the left lay the other semi-detached house, and beyond it to the left a row of public buildings, which retreated further back. To the right of A's houses stood a row of buildings in line with them. You would have thought that A could have built on the same site as before, since he had one house on one side and a whole row on the other to keep him company in a forward position. But no! He had to put his rebuilt house back to the line of the public buildings, thus making a most irregular line, for on the left there would thus be a row of public buildings standing back, then there would come A's untouched house standing forward, then his rebuilt house standing back, then the row of houses standing forward. The case, however, is a Scotch one, and this may be the Scotch idea of a straight line. The reason why it was so decided was that A's two houses were for this purpose treated as one building and the untouched one was only considered as half a building and therefore ignored as a factor in regulating the building line.

Now, suppose that next to the house you have demolished, or the front of which you have taken down, there stands, not a row of houses, but a row of old sites, with, perhaps, a stone or two standing above their naked foundations. Can these interesting ruins be taken into account so as to set the line of buildings either forward or backward? Yes, they can, unless the owner has clearly abandoned all intention of rebuilding on these foundations. A mere delay, however, of two or three years will not be evidence of intention on his part not to rebuild.

Now suppose, on the other hand, that, next to the house the front of which you have taken down, a builder is putting up a row of unfinished houses. Your business will be to begin to rebuild before he has finished or nearly finished; for an unfinished house cannot, according to reported decisions, be a governing house for the purposes of the Public Health (Buildings in Streets) Act, and I apprehend that neither can it be taken into consideration in prescribing the line of buildings under the Public Health Act. (Of course, these houses must be on new foundations or they will come under the previous case.) Before the builder has finished his houses the authority cannot make you keep in line with them. After you have begun, the authority cannot prescribe for you at all. You will thus escape their attentions.

The urban authority can prescribe a line but the rural authority can only do so if they obtain powers from the Local Government Board. You may, therefore, find that, owing to the locality in which you are building, you are free from anxiety on this point. Then, as to the compensation. It need not be tendered when the line of building is prescribed. The amount is fixed by arbitration in the usual way. It is for you to consider whether it will be better to accept the compensation offered or wait for the arbitrator to award a greater or less sum, or to refuse the compensation and go to the expense of the piece-meal demolition and restoration which I have suggested.

If, in spite of the luring bait of compensation, you refuse to set back your building after a proper prescribing, the urban authority has two methods of punishing the owner and builder, but cannot punish the architect. They may get an injunction to restrain the continuance of the offending work, or to command the offenders to pull it down, but they cannot take the law into their own hands and pull it down themselves, except where it actually encroaches on a public way. They may also indict the owner or builder criminally. They can thus have his building pulled down by one Court and punish him in another.

Council for the defence may have several ways of meeting the action or prosecution. He may defend on the merits by denying that the structure the front of which was pulled down, or the structure put up in its place, was a building, as, *e.g.*, if it was a small railing. Or he may show that the street in which it stood was not a "street" for the purposes of the prescribing method, or that it was not "in" that street. Or he may bring witnesses and adduce arguments to show that the building or its front was never really pulled down, or that you did not vacate the site as far back as the authority wished to set you. As he may show that the line has not been prescribed in time, in what circumstances will you allow him to plead this point? Well, if you have done anything in the way of rebuilding, for instance, have put in fresh foundations or begun to build on the old ones, it will be too late for the authority to set you back. The principle is that the authority must not be trying to get you to pull down work innocently done in front of the line before they prescribed it, and waste your labour. You can say, "Had I known, I would not have rebuilt in front of the line." In the case that follows we shall see that even where you have begun to build behind the line previously to its being prescribed, the authority cannot waste your labour by not, indeed, asking you to physically demolish it, but by wishing you to abstain from doing that which is necessary in order to make your work of any use. You can say, "Had I known, I would not have built as I did." The principle is the same. Suppose, for instance, you have pulled down, and then, without having built anything, not even a foundation on the site of your demolished front, you have put up at the back of that site a building which absolutely requires some building or other in front of it as a necessary compliment. For instance, you have pulled down a building, and the site of the front of such building still remains vacant, but you have already begun to build a nave of a church at the back, and the authority try to cut off the chancel and vestry which you intend to build in front of the nave by prescribing a line, and thus forbidding you to build on the site of the demolished front. The urban authority are not entitled to do this. They have prescribed too late, for though you have not begun to build on the front site, you can truly say to them, "You let me put up a building, and then try to make it useless by cutting off a necessary adjunct. I should not have put it up at all if I had known you would do this." But if, for instance, you have begun work on a school at the back of the vacated front site which the authority wishes to keep open, and the buildings which you wish to put up in front of it and of the prescribed line are merely annexes, such as a lavatory, which could either be dispensed with or put elsewhere, and which, of course, I am supposing you have not yet begun to build, the local authority can in this latter case prescribe so as to cut off the site of your intended annexes. Delay will be fatal to the authority, though they have not been guilty of negligence, and though the builder had good reason to know that they were thinking of prescribing a line.

Your counsel, again, might be able to show that before you began to pull down you had good reason, not merely from the inaction, but from the conduct of the authority, to consider that they had no intention of prescribing a line, and that on the faith of this you were led to act as you did in pulling down. And, of course, if, before you began to pull down, you told them where you were going to rebuild, and they approved of your intention, they could not but lose their case. It may, therefore, be wise, and will usually be obligatory, before you pull down the front of a house to tell the authorities where you intend to rebuild. It has been decided, however, that the local authority could prescribe a line for a builder after having just permitted another builder to erect a house in advance of the line.

We will now presume that the local authority has been punctual in the proper sense of the word—that is, neither too early nor too late—that you have come under the provisions as to prescribed line, and that they have drawn the line correctly. Can they keep the owner waiting an indefinite time for the writ, or, perhaps, for the policeman who is to lead him off? Well, of course, if they are suing to prevent a building being put up, they must do so before it is put up, otherwise there is no limit to the time they may wait. Counsel for the defendant, however, will not omit to dwell on this delay with all the eloquence at his command. If the case goes against you, can you appeal? If the action is for an injunction you can, but, if the offender is indicted, there is no appeal except for technical defects.

I said that the authorities have no other remedies but the above, and I here repeat it. They cannot sue you summarily. They cannot themselves pull your building down. If they want it down they must go to the High Court. It is true that the courts have held that an authority may refuse to approve your plans, on the ground that they have contravened provisions other than those contained in the by-laws; but what of that? Disapproval is of itself merely a "brutum fulmen" The legislature only requires approval or disapproval to be shown in order that the builder may not be in the dark, but may have a danger signal before the authority proceeds.

You may, however, have also brought yourself under the Public Health (Buildings in Streets) Act of 1888, or you may have broken some by-law in your rebuilding. In such case the owner will be liable to other proceedings as well.

Setting Back Houses.

This brings me to the question whether a local authority can set houses back by making by-laws as to new streets or new buildings. Can they, by by-laws as to new streets, set back an old demolished building, the whole of which you have pulled down to the ground floor? It has been held that they cannot by by-laws do, without compensation and by a penalty, what a section of the Act has allowed them to do with compensation. But, for all this, if in building your demolished house, or, at any rate, in building a house where none ever stood before, you proclaimed an intention of laying out a new street, then you may come under the by-laws. You will in such case be unable to build, if, owing to the position of the house you intend to put up, you cannot do so without curtailing the street required by the authorities. They must, however, show that you had this intention of laying out a new street, either from plans which you have shown them and have begun to carry out on the land, or from work actually done in making or altering the boundaries of a road. They must also show that you would encroach on the actual footway or carriageway of the required street.

Next, can they set back an old demolished building by by-laws as to air space. Well, if you have not contented yourself with pulling down the front, but have also pulled down the rest of the house to the level of the ground, I certainly think they can. Any disobedience to by-laws renders the offender liable to summary penalties, and your building will be pulled down and the expenses of removing it be recoverable against the owner. There is a method of setting back old buildings, and that is by conpulsorily buying the sites, but with this we are not concerned. Now we come to the Public Health (Buildings in Streets) Act, 1888, which, I may remind you, deals with new buildings as well as old ones, and only applies to urban districts or to such rural districts as have obtained leave from the Local Government Board to enforce it. In this last respect it resembles the prescribing method. Under the above Act you may not without the written consent of the urban authorities put up a new building, or put up a new addition in front of an old building, or put up a new addition on the top of an old building, in such a position that the new building or the new addition will project in front of the main front wall of that building next to you which stands furthest back and is in the same street. I shall speak of your neighbour's building as the "governing building."

What additions will be forbidden? Any addition that comes too far forward, if it is large enough. A small wall and a small conservatory would be legal; a large wall or a large conservatory would be illegal. What kind of building must your neighbour possess for it to be a governing building? It must I think be something in the nature of a house described by the Act as having a "main front wall." As to what is a street, we have already discussed this matter and we have also observed that a corner house can be in two streets.

Suppose the alleged governing house stands, for instance, 64ft. back from the street; it cannot prevent you from adding to your building, as it can hardly be said to be in the street for the purposes of the Act. Then, again, suppose that your house is in an old street and someone makes a new and wider street in continuation of this old street. Can you put up an addition which would be in front of the houses in the wide new street? Yes, certainly; the two streets are distinct. Again, it has been held that a wide street of palaces and a narrow back street, though one formed a continuation of the other, are not the same street. As to whether a building is in the same street, and also as to what is the "main front wall," we may refer to a Bristol case, illustrated by Fig. 4. In this case there was a shop B which the owner brought forward to near the roadway. Next to this shop on the other side of the lane, and of a small area, was the wing A of the Blind Asylum. This wing stood back a considerable distance from the road. Then came a large courtyard which ran a very long way back to the main body of the asylum. Beyond this courtyard and right up to the road came the other or left wing of the asylum. It was held that the front of the wing A was not the main front wall of the Blind Asylum, so as to keep the owner of the shop from building forward. The Court said that the governing "building must be looked at as a whole, its character, position and distance from the house or building which is being erected must be considered. A particular wing must not be selected. Nor are two buildings necessarily in the same street because one faces the same street or a continuation of the same street as the other." In another case as to main front wall it was held that a house which turned its side to the street (see Fig. 5) could not be a governing house. The side wall was not a main front wall.

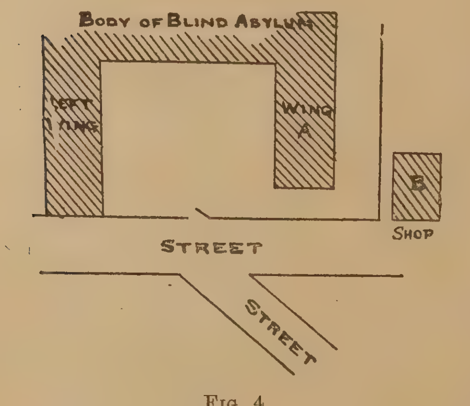

Fig. 4.

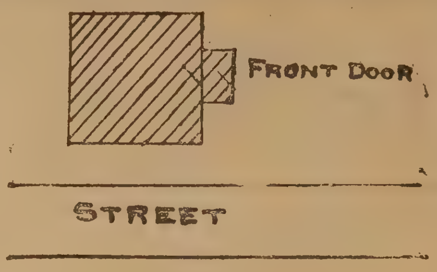

Fig. 5.

What is to be done then if you want to build your house forward or add to it some addition which would project? The consent in writing of the surveyor ought to be obtained, and it would be well to persuade him to enter it on the minutes of the Council, but no consent given by word of mouth or presumed from the conduct of the surveyor or the authority can avail you. In the absence of this consent there may be another method which I indicate below.

With the penalty I will not deal now, as the recovery of penalties forms the subject of a subsequent part of my paper. Suffice it to note that there is a continuing penalty of 40s. a day or less, which does not begin till the day after notice that you have infringed the Act and which must stop on the anniversary of the original offence when you first made any projection worth considering. Also note that a building put up in breach of the Public Health (Buildings in Streets) Act cannot be pulled down without your consent, except so far only as it projects into the footpath or roadway. A consideration of these two facts leads me to suggest that it may be worth your while to set your building forward, where, owing to circumstances, you are morally justified in not complying with the Act in this respect. Your building cannot be pulled down and the owner cannot be made to pay more than £730 and costs, and the extra land you gain may be worth more than this.

Another variety of the precept "thou shalt not build" confronts the architect in the case of open spaces, highways and streets. It rarely occurs to the man who perambulates the park or the public street or highway to ask, "To whom does this belong?" A private man or body of men may have the freehold, and always in the case of streets and highways does possess it. Their rights must be respected, for they own the land up to the sky, and, subject to any rights of subsoil being in some other private person or company, they own the soil down to the middle of the earth. The smallest freeholder may justly swell with pride as he contemplates the vastness of his estate. Thus, even the local authority are not complete lords of their own streets. They cannot authorise the laying of trade pipes, or make tunnels, for instance, for subways and similar works without the freeholder's leave. Their sole right is to lay gas pipes, water mains, sewers, or electric wires, and to protect these. Or a local authority may, in the case of open spaces, be either the freeholder or the leaseholder, and have rights as such. The rights of these freeholders and leaseholders, whether private men or local authorities, must be borne in mind when you wish to put out a projection overhanging, or to excavate a tunnel or cellar undermining, an open space, highway, or street; and I will presume that you have respected these rights. We pass on to the

Rights of Easements

which are vested in local authorities, that is, to those rights of the public to use and enjoy the open spaces and to promenade along the pavement or to drive carriages or haycarts along the streets or highways without let or hindrance, and to have their gas and water mains, or their electric wires and their sewers, undisturbed by underground tunnels and vaults.

If you wish to overhang an open space, highway, or street, you need not get the consent of the local authority in their capacity of guardians of the right of way; but you must not obstruct or endanger the public in their use of such open spaces or ways. Thus, in the case of a street or highway, your projection or bridge, if over the pavement, must be above man's height, and if over the street must be above the height of such vehicles as are likely to "use the street as a street." Thus it must be possible to take a haycart along the road, and perhaps a fire-escape. Nor must you put a cornice which might drip over passers-by on a rainy day.

If you wish to tunnel under an open space you must not disturb the soil so as to lessen the amenities of the park, and in the case of a street you must leave undisturbed such portion of the subsoil as the authority may need for their gas pipes, sewers, water mains, or electric wires, and not only must these be respected, but the whole stratum in which they lie must be treated as sacred. As regards tunnels, vaults, or cellars under the carriageway of any street of the urban authority (and this would include a bridge other than a county bridge, but not a main turnpike road), you can only make such excavations with a written consent of the local authority; such consent is only valid if in writing, and cannot be presumed from conduct. For breaking this rule there is a lump penalty, and a daily penalty recoverable before justices of the peace. The authority may also remove the building, and recover the costs of doing so before the same tribunal. There may be other bodies having statutory or other rights in the surface of the street and a portion of the subsoil, and these you must respect. In the case of disused burial grounds, you must not disturb the dead, unless you get special powers to do so.

If you wish to build upon the public park or to overhang it so as to obstruct passage, you must get the consent of the local authority, but, even if you are employed by them, they have a sacred trust for the public, and only such buildings as conduce to recreation can be placed thereon. You cannot even by their orders put up a town hall or a school, but you can put up a conservatory, a public library, or a museum, and, as it seems to me, such buildings as a boat-house, shelters, refreshment and other kiosks, baths, gymnasiums, and other places for indoor exercise, monuments, and rooms for entertainments, or a gatekeeper's lodge. No building of any kind, not even a bandstand, can be placed in a disused burial ground. Statues and monuments may be put in the streets only if the Public Health Act Amendment Act is adopted. (No freeholders' or leaseholders' consent can enlarge these powers.)

Before leaving these sins of commission, it may be well to consider the case of brick-burning. This is a nuisance at common law if it interferes with the amenities of the neighbourhood, but it is not subject to the technicalities of the Public Health Act regarding the nuisances or offensive trades. It is punishable by the ordinary methods if it does cause a nuisance.

Now for a few sins of omission against the public. You have a quarry by the roadside. Have you fenced it? If not, beware of the complicated technicalities of sections 91 to

111 of the Public Health Act, 1875. You are erecting or repairing a building or the front of it near the public street and have not remembered to put up a hoarding, nor a hand rail, or red lamp, as required by the Towns Improvements Clauses Act. If so, beware of the urban district or the town council. In any case these hoardings must not impede traffic.

Or the builder may have left a heap or an excavation for an unreasonable length of time in the street, and may have omitted to light such heap or hole at night. This is an offence under the Towns Improvements Clauses Act. Besides all these the owner may be liable for commissions or omissions under a local Act, and if there is one it may be well to see that proper water spouts are put on buildings to prevent their dripping into the streets, so that while the indignant passer-by is looking up to discover where your waterfall comes from he does not fall into your unfenced cellar. Lastly, the doors of your building must be made to open inwards, unless it is a public building with special leave obtained. Any by-laws also must be carefully attended to.

New Patents.

These patents are open to opposition until March 6th.

1899.—Expanded Metal.—2,672. F. H. PITKIN and J. THOMPSON; both of Chicago, U.S.A. The machine consists of a number of rotary cutters (driven through worm gearing and arranged in series), pressure rolls and stationary knives. By these means the sheet is simultaneously cut and expanded and the operation can be carried on continuously, the sheets being passed in flat at one end and coming out finished at the other. It is claimed that there is no danger of the metal fracturing when treated by this machine.

Stone-sawing Machinery.—3,796. G. ANDERSON, Carnoustie, N.B. The diamond circular saw is mounted on a sleeve that can slide on the shaft (horizontal), the position of the sleeve being alterable whilst the saw is running, by means of cross-beams, pulleys and chains, thus facilitating the adjustment of the cut. There are top and bottom guards to prevent the water and sand flying about, and any diamonds that become loose are caught in a trough. Hardwood blocks are provided to reduce shaking of the saw. The stone is mounted on a table, having rollers, operated by gear.

Sewage Filters.—4,460. C. J. WHITTAKER and W. C. BRYANT; both of Church, Lancs. The filters are polygonal or circular in form and the spaces between act as shafts through which air can be drawn into the bottom channels or drains. There is also an air shaft in the centre of each filter. The bottom is of concrete, sloped. Additions can be made to filters of this kind without any diminution in the efficiency of the aeration.

Acetylene Gas Generators.—22,516. A. STERN, Berlin. The delivery pipes from the various generators enter a tank which has a small depth of liquid at the bottom. The ends of the pipes dip into this slightly, thus forming a seal. There is an outlet at the top of the tank leading to the main pipe, and near the bottom is an overflow pipe to keep the water-level constant. The main feature is that the ends of the pipes are only immersed slightly.

The following specifications were published on Saturday last, and are open to opposition until March 10th. A summary of the more important of them will be given next week. The names in italics within parentheses are those of communicators of inventions.

1899.—176, NICOL, means of cutting mitre and other angle joints. 1,805, WILLIAM DICKEN, WILLIAM WADE, and LEONARD LUMSDEN GRIMWADE, continuous muffle furnaces or kilns. 2,186, BOND, apparatus for generating, storing, and supplying acetylene gas. 2,244, BAER, device for securing the plinths or washboards of walls. 2,798, HAMMOND, roofing tile. 3,005, LANE, electric switches. 3,109, RUTTENBERG and VAN ZANTEN, walls and ceilings, or covers or ornamentation therefor, and method of making them. 3,163, BROWNING, smoke consumer and fuel economiser. 3,930, WESTWOOD, bearings for girders, beams, trusses, &c. 4,216, GROVES, dust refuse and similar carts or waggons. 4,252, RUNGE, process of and apparatus for burning cement, lime, and the like in blast furnaces. 4,644, MACTAGGART and SCOTT, hydraulic pumps. 4,715, TIMINGS, manufacture of metal handle knobs and other metallic knobs. 4,750, MILWARD, chimney cowl and ventilator. 5,504, LINDSAY, construction of Banbury or Stock locks. 7,696, WEBB, handles for planes and other tools. 10,041, ROBERTS, means or apparatus for breaking or crushing coke, lime, and the like. 15,977, HIGGINS and SANDILANDS, apparatus for the production of acetylene gas. 19,070, DREW, guards for circular saws. 21,258, CODE AND KNUDSEN, adjustable pulley gear. 21,805, HADDAN (*Plano Manufacturing Co.*), chains. 22,085, BOULT (*Nieske*), the treatment of materials for fireproof and preservative purposes. 23,179, TURNER, gas generating apparatus, and more particularly means for generating acetylene gas. 23,181, MEYER, surface decorations and ornamentations. 23,309, SMITH, acetylene-gas generators. 23,548, EHRHARDT, portable shed. 23,937, ADOLFSSON, acetylene-gas generating apparatus. 23,964, CZERNY AND SCHLIMP, hydraulic presses for use in the manufacture of blocks of artificial stone.

Keystones.

At Marlborough College a new reading room, 90ft. by 30ft., several classrooms and a racquet court have been provided to commemorate the jubilee of the foundation of the college.

Art Gallery Destroyed by Fire at Newcastle.—The old Art Gallery in Grainger Street, Newcastle-on-Tyne, was burnt out on January 23rd. It was opened in June, 1839 and was designed by Mr. Richard Grainger, and included the rooms of the Arts Club, a café, restaurant, and the Vaudeville Theatre. The damage is estimated at about £40,000.

M. Rodin, the eminent French sculptor, will enjoy an exceptional distinction in the summer of this year. The greater part of his statues and reliefs will be brought to Paris and formed into a special exhibition in a building erected exclusively for their reception upon a site in the Rue Jean Goujon, in the Champs Élysées. M. Sortais, a young French architect who has not long returned from the Villa Medicis, has been selected by M. Rodin to design it.

Wesleyan Chapel Building.—The forty-fifth annual report of the Wesleyan Chapel Committee states that in addition to £369,441 expended on new erections and in reductions of debt, official sanction has been given to a further expenditure of nearly half a million. The scheme includes the following:—122 new Wesleyan chapels, estimated to cost £304,377; 21 ministers' houses, to cost £16,904; 168 enlargements and alterations, estimated to cost £92,415. These, with other projected schemes, bring up the total expenditure to £455,053.

Battersea Polytechnic.—The prizes and certificates gained by the winning students at this polytechnic were distributed on Wednesday evening last by Lord Russell of Killowen. The report showed an increase in the number of students, while the successes obtained were greater than in any previous year, the total value of the scholarships won by day and evening students being £1,250. The Principal stated that over 1,100 students presented themselves for examination, of whom 769 had been successful—twenty-three passing in honours and thirty-four gaining medals and prizes.

Glasgow Institute of Architects.—The Alexander Thomson Memorial Travelling Studentship of £60 has been conferred upon Mr. L. Rome Guthrie, trained in the office of Mr. William Leiper, R.S.A.

Municipalisation of Gas Works.—During the past year twelve gas undertakings in this country have been transferred from companies to local authorities, bringing up the total number of such transfers for the past twelve years to fifty.

The Rooms at the Palace of Versailles are proposed to be filled with carefully-made models of Louis XIV. furniture, as towards the close of last century most of the Versailles furniture was sold, and has been widely dispersed over Europe and America.

Glasgow's New Art Galleries. — On Saturday afternoon last about ninety of the High School constructional students inspected the new art galleries at Kelvingrove, now approaching completion. Mr. George Monteath conducted the party.

The Criterion Restaurant, Piccadilly, is being remodelled. American marbles now cover the walls of the buffet (which is 143ft. long and is supported by a series of arches and columns ornamented with plaques of lapis-lazuli and malachite), being inlaid with mosaic in gold and mother-of-pearl. The restaurant was opened in 1873.

A Judge on the Housing Problem.—Judge Emden, in a recent housing case at the Lambeth County Court, said: "The root of the housing difficulty in London is that persons who almost invariably describe themselves in ejectment notices as 'gentlemen' buy small house property as speculators, and put it in the hands of agents with directions to get as high a rate of interest as possible."

Ruskin's Portrait and Bust. — The trustees of the National Portrait Gallery, having already in their possession a portrait of the late Mr. John Ruskin, drawn in chalks by G. Richmond, R.A., and also a terra-cotta bust of the same, modelled by Sir J. E. Boehm, R.A., have decided to place these two portraits immediately on exhibition in the galleries, suspending their usual rule as to the expiration of ten years from the date of a person's decease.

Church Crafts League.—The following are on the provisional committee of the new Church Crafts League (referred to on page 378 of our issue for January 17th):—The Bishop of Rochester, Canon Scott Holland, Sir W. B. Richmond, R.A., Canon Rhodes Bristow, Mr. W. Goscombe John, A.R.A., Canon Gore, Mr. Henry Holliday, Rev. Percy Dearmer, Mr. Conrad Dressler, Mrs. Rupell Barrington, Mr. A. G. Walker, Hon. Mabel de Grey, Miss M. Lowndes and Miss Emily Ford.

Cartwright Memorial Hall: Builders' Grievance.—Combined action is being taken by the various sections of the building trade in Bradford to obtain a modification in certain requirements imposed by the Corporation with regard to the Cartwright Memorial Hall. The grievance consists of a stipulation that firms submitting estimates will have to give one tender for all trades. Although the Cartwright Memorial Hall Committee have decided to allow the successful firm to sublet the various contracts locally, it is contended that a departure has been made from the usual practice. A petition is to be presented to the Corporation.

Funeral of Mr. Ruskin.—On Thursday last the body of the late Mr. John Ruskin was buried at Coniston Church. Among the numerous flowers was a wreath from Her Majesty the Queen; Mr. G. F. Watts, R.A., sent a cross of Greek laurel, and on the accompanying card Mrs. Watts had written: "It comes from our garden, and has been cut before three times only—for Tennyson, Leighton, and Burne-Jones." The coffin was covered with a pall of hand-spun linen, woven at the Keswick School of Art. It had a border of red roses and rosebuds and bore the emblem of St. George and the legend "Unto this last." Simultaneously with the service at Coniston, a memorial service was held in Westminster Abbey.

TAKING OUT QUANTITIES.

AN IMPORTANT CASE.

THE case of Restell v. Nye was heard before Mr. Justice Mathew on January 23rd in the Queen's Bench Division of the High Court of Justice. The defendant was employed by the plaintiff as architect in connection with the building of a bungalow for the plaintiff in Sussex. By the terms of the employment the defendant was to be paid by the plaintiff for "plans, specifications, and supervision of works" 5 per cent. upon the amount of the expenditure, travelling and out-of-pocket expenses to be charged extra. In accepting the defendant's offer in these terms the plaintiff wrote that the charge was to be an inclusive charge covering everything. The defendant entered upon the work. He prepared a specification on which tenders were obtained, and included in it a provision that surveyor's charges for bill of quantities should be 2½ per cent. on the amount of the estimate, and for drawings, &c., £10 10s. The defendant himself prepared a bill of quantities, and obtained a tender from some builders at Brighton for the erection of the bungalow for £1,790. The tender was accepted, and a contract was signed by the plaintiff, which provided that the price should be paid by instalments upon the defendant's certificates, and that his final certificate should be conclusive evidence that the builders were entitled to receive payment of the final balance. The work was completed, and the plaintiff paid the contract price, together with the cost of certain extras on the defendant's certificates. The defendant was paid by the builders 2½ per cent. on the contract price for taking out the quantities and the ten guineas for the drawings. The plaintiff alleged that the receipt of these payments by the defendant was a breach of the defendant's term of employment, and was, alternatively, a secret profit made by the defendant in the course of his employment. The defendant contended that the ordinary course of business had been followed, and that the plaintiff was fully aware that the cost of taking out the quantities was not included in the defendant's charges for acting as architect to the work. The second head of the plaintiff's claim was for damages for negligence on the part of the defendant. The plaintiff's case was that the defendant had omitted to check the builders' accounts with due skill and diligence, and had passed as extras works included in the contract and had certified for sums improperly passed. These allegations were denied by the defendant. Since the action was begun the plaintiff had died, and his executors had been substituted as plaintiffs.

Mr. Justice Mathew, in giving judgment, said that the defendant alleged that the terms of his employment by the plaintiff were that his charges were only to cover the ordinary work of an architect, apart from the work of taking out the quantities. The course of business with regard to taking out the quantities was that the builder employed some one to take out the quantities. The builder affixed his own prices to the quantities, and he added to the amount of his tender the fee of the quantity surveyor, and in the event of the tender being accepted that fee was included in the first certificate given by the architect. It was not usual in London for the builder to employ the architect to take out the quantities, but it was said that in the country it was permissible, and that it was not considered that there was anything objectionable in that course being followed. In the present case the defendant, who was the architect to the work, acted as quantity surveyor, and the amount of his fee was included in the sum for which the defendant, as architect, gave his first certificate. Some time afterwards the plaintiff discovered that this had been done, and he claimed the benefit of the payment on the grounds that by the terms of the employment the defendant's charge was to be an inclusive one. On the other hand, the defendant said that the agreement contained in the correspondence was confined to his ordinary duties as an architect, and that the builder might, if he had chosen, have employed anyone else to take out the quantities, which, it was admitted, was a necessary thing to be done. His Lordship came to the conclusion that the agreement between the plaintiff and the defendant did not cover the cost of taking out the quantities; but his Lordship felt compelled to add that he did not think that the defendant had acted as an honourable man, because he had concealed from the plaintiff the fact that he was making this arrangement. The plaintiff was, unfortunately, now dead, but the learned judge was satisfied from the correspondence that the defendant did not disclose to the plaintiff the arrangement with the builder as to taking out the quantities. It was conceivable that if the plaintiff had known of it he might have disapproved. With regard to the other part of the case, his Lordship was satisfied that the defendant had been guilty of negligence which had benefited the builder at the expense of the plaintiff. His Lordship was clearly of opinion that damages were not recoverable. The principle of law applicable to the case was that when two men employed a third to settle a dispute they were bound by what he decided. The parties were supposed to have satisfied themselves as to the third person's skill and care, and they were not allowed to say, after his decision had been given, that he had acted negligently or with want of skill. The result was that there must be judgment for the defendant, but without costs.

ARCHITECTURAL ASSOCIATION.

A MEETING of this Association took place last Friday evening at No. 9, Conduit Street, the president, Mr. G. H. Fellowes Prynne, F.R.I.B.A., in the chair. The minutes having been read and confirmed, Mr. Prynne announced with great regret the decease, which occurred suddenly on Monday, January 22nd, of Mr. William White, F.S.A., F.R.I.B.A., who was president of the Association from 1868 to 1891. He referred to him as one who was always enthusiastic in his work, and one of the first in the Gothic Revival movement. Mr. Prynne also referred to the death of Mr. John Ruskin, whose loss, he said, perhaps to them as architects, they felt more than workers in any other kind of art. Ruskin was one who really loved their art as an art. His "Seven Lamps of Architecture," the ideas of which were elaborated in "The Stones of Venice" and also his other books, had inspired the public more with the true love of architecture than any other works in the past century. He would advise students to read the works of Ruskin, who seemed to be thoroughly overwhelmed with that perfect truth of Nature's works. His exaggeration, if a fault, was a fault on the right side; when he wrote those books, he was surrounded with a great degradation of all the arts. In his Lamps of Truth and of Sacrifice he brought out the very highest ideals it was possible to have in art. Behind all he wrote there was that deep sincerity, that deep feeling of love of what he was writing. The following gentlemen were then elected members of the Association: Messrs. A. N. Campbell, J. T. Burt, T. L. Dale and J. W. S. Humphreys Davies; after which a paper on "Cast Iron," reported in our supplement this week, was read by Mr. W. R. Lethaby.

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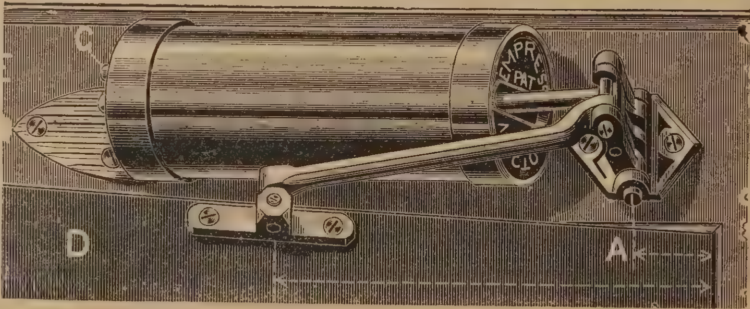

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New Companies.

Warner, Marshall and Co., Limited.

This company was registered on January 19th by W. H. Milne, 11, Hart Street, Bloomsbury, W.C., with a capital of £3,000 in £1 shares. Object, to carry on the business of auctioneers, surveyors, land and estate agents, &c. Registered without articles of association. Registered office: 11, Hart Street, Bloomsbury, W.C.

Castle Donington Brick Co., Limited.

This company was registered on January 18th by Jordan and Sons, Limited, 120, Chancery Lane, W.C., with a capital of £2,500 in £10 shares, with objects as indicated by the title. The first directors (to number not less than three nor more than seven) are W. S. Eaton, G. T. Eaton, J. G. Shields, T. Webb, G. Welch and F. E. Burton. Qualification, £150. Remuneration as fixed by the company. Registered office: Castle Donington, near Derby.

Quarry Waste Development Company, Limited.

This company was registered on January 16th by Aylward and Cobbett, 16, Clifford's Inn, E.C., with a capital of £1,000 in £1 shares. Object, to acquire from G. M. Callender and carry on the business of a consulting brickworks' engineer carried on by him. The first directors (to number not less than two nor more than five) are to be appointed by the subscribers. Qualification, twenty shares. Registered office: 11, Victoria Street, S.W.

Smoke Preventer and Fuel Economiser Limited.

This company was registered on January 18th by Budd and Co., 24, Austinfriars, E.C., with a capital of £300,000 in £1 shares, 100,000 of which are preference and 200,000 ordinary. Object, to adopt and carry into effect a certain agreement relating to improvements in inventions for the prevention of smoke, economisers of fuel, or the production of increased heat in boilers or other furnaces and fires, stoves, lamps; and in particular to acquire from J. Alves, of 131, William Street, Melbourne, in the colony of Victoria, the letters patent for Great Britain numbered 4,910, for improvements in and relating to fire bridges for steam boilers and other furnaces, and to develop, deal with, work, and turn to account the said inventions. The first directors (of whom there shall be not less than three nor more than seven) are M. Guthrie, H. Macdonald, J. Alves, J. McLaren and A. Anderson. Qualification, £250. Remuneration, chairman £300, ordinary directors £100 per annum each, to be increased according to profits.

Asbolith Flooring Company, Limited.

This company was registered on January 18th by Heath and Co., 3, New London Street, Mark Lane, E.C., with a capital of £20,000 in £1 shares. Object, to acquire from A. Reiner the benefit of an invention by O. Kraner for a material for making floors, ceilings, &c., and to manufacture and deal in the said material. The number of directors is to be not less than three nor more than seven; two of the first are to be nominated by A. Reiner and the others by the subscribers. Remuneration as fixed by the company. Registered office: Dashwood House, E.C.

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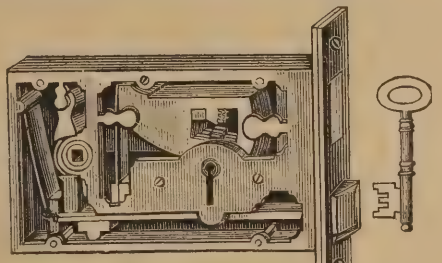

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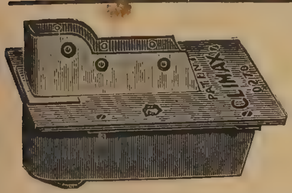

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		£ s. d.	£ s. d.
Hay, best	per load	3 10 0	4 0 0
Sainfoin mixture	do.	3 15 0	4 5 0
Clover, best	do.	4 5 0	5 0 0
Beans	per qr.	1 8 6	—
Straw	per load	1 4 0	1 16 0

OILS AND PAINTS.

		£ s. d.	£ s. d.
Castor Oil, French ...	per cwt.	1 5 8	1 8 0
Colza Oil, English ...	per cwt.	1 6 9	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	1 11 0	—
Linseed Oil	per cwt.	1 3 7½	1 3 9
Petroleum, American ...	per gal.	0 0 7¼	0 0 7½
Do., Russian ...	per gal.	0 0 6⅛	0 0 6¼
Pitch	per barrel	0 8 6	—
Tallow, Town	per cwt.	1 6 6	1 10 0
Tar, Stockholm	per barrel	1 5 0	1 5 6
Turpentine	per cwt.	1 19 6	—
Lead, white, ground, carbonate	per cwt.	1 3 0	1 4 0
Do. red	per cwt.	1 0 4½	—
Soda crystals	per ton	2 17 6	3 0 0
Shellac, orange	per cwt.	3 2 6	—

METALS.

		£ s. d.	£ s. d.
Copper, sheet, strong ...	per ton	82 0 0	—
Iron, bar, Staffs. in London	do.	10 10 0	11 10 0
Do. Galvanised Corrugated sheet ...	do.	15 0 0	—
Lead, pig, Spanish ...	do.	16 5 0	—
Do. do. English common brands	do.	16 12 6	—
Do. sheet, English, 6lb. per sq. ft. and upwards	do.	18 10 0	19 0 0
Do. pipe	do.	19 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	10 0 0	11 0 0
Do. floor brads	do.	9 15 0	10 15 0
Tin, Foreign	do.	121 0 0	121 10 0
Do. English ingots ...	do.	124 10 0	125 10 0
Zinc, sheets, English ...	do.	27 10 0	28 10 0
Do. do. Veille Montaigne	do.	26 7 6	—
Do. Spelter	do.	22 8 9	22 15 0

TIMBER.

SOFT WOODS.

		£ s. d.	£ s. d.
Fir, Dantzic and Memel	per load.	3 0 0	4 0 0
Pine, Quebec Yellow ...	per load	4 7 6	6 5 0
Do. Pitch	do.	3 12 0	3 15 0
Laths, log, Dantzic ...	per fath.	4 10 0	5 10 0
Do. Petersburg	per bundle.	0 1 4½	0 1 5
Deals, Archangel 2nd & 1st	per P. Std.	17 5 0	21 5 0
Do. do. 4th & 3rd.	do.	12 10 0	14 5 0
Do. do. unsorted	do.	12 5 0	12 10 0
Do. Riga	do.	6 15 0	8 10 0
Do. Petersburg 1st Yellow	do.	17 0 0	—
Do. do. 2nd „	do.	8 15 0	12 0 0
Do. do. Unsorted „	do.	10 15 0	11 0 0
Do. do. White	do.	7 15 0	11 5 0
Do. Swedish	per P. Std.	9 5 0	17 10 0
Do. White Sea	do.	17 10 0	18 0 0
Do. Quebec Pine, 1st...	do.	19 5 0	24 10 0
Do. do. 2nd	do.	10 5 0	12 0 0
Do. do. 3rd &c.	do.	8 10 0	9 15 0
Do. Canadian Spruce, 1st	per P. Std.	9 15 0	11 0 0
Do. do. 3rd & 2nd	do.	10 0 0	11 10 0
Do. New Brunswick	do.	7 5 0	8 0 0
Battens, all kinds	do.	8 5 0	10 0 0
Flooring Boards, 1 in. prepared, 1st	per square	0 11 9	—
Do. 2nd...	do.	0 9 6	0 11 6
Do 3rd &c.	do.	0 8 3	0 9 6

HARD WOODS.

		£ s. d.	£ s. d.
Ash, Quebec...	per load	3 17 6	4 10 0
Birch, Quebec	do.	3 12 6	3 17 6
Box, Turkey...	per ton	7 0 0	15 0 0
Cedar, 1in., Cuba	per ft. sup.	0 0 4½	—
Do. Honduras	do.	0 0 4 1/8	—
Do. Tobasco	do.	0 0 4½	—
Elm, Quebec	per load	12 6	5 10 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 4 11/16	—
Do. African ...	do.	0 0 4 13/32	—
Do. St. Domingo ...	do.	0 0 3¾	—
Do. Tobasco ...	do.	0 0 6	0 0 7⅛
Do. Cuba ...	do.	0 0 7 29/32	—
Oak, Dantzic and Memel	per load	3 0 0	3 3 0
Do. Quebec	do.	4 12 6	5 0 0
Teak, Rangoon, planks ...	do.	10 0	16 10 0
Wainscot, Riga (Baulk) ...	do.	3 15 0	5 15 0
Do. Odessa Crown...	do.	3 15 0	5 15 0
Walnut, American ...	per cub. ft.	0 9	0 3 5

COMING EVENTS.

Wednesday, January 31.

SOCIETY OF ARTS.—Sir W. M. Conway on "The Undeveloped Resources of the Bolivian Andes." 8 p.m.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers).—Mr. John Castell-Evans, F.I.C., on "Air and Ventilation; Combustion and Respiration." 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION (Newcastle-upon-Tyne).—An Evening of Notes, by Mr. Jas. T. Cackett, F.R.I.B.A. 7.30 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

CLERGY AND ARTISTS' ASSOCIATION.—Annual meeting, 10, Tor-gardens, Campden Hill. 3.30 p.m.

Thursday, February 1.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Arthur Thomson, M.A., M.B., on "The Anatomy of the Human Form: The Lower Limb." 6.15 p.m.

CIVIL AND MECHANICAL ENGINEERS SOCIETY.—Mr. F. H. Hummel, A.M.I.C.E., on "Graphical Solutions of Certain Problems in Engineering." 8 p.m.

SOCIETY OF ANTIQUARIES OF LONDON.—Meeting at 8 p.m.

Friday, February 2.

ARCHITECTURAL ASSOCIATION.—(Discussion Section.)—Mr. G. M. Nicholson on "Opening-up Land for Building Purposes." 7 p.m.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. John Castell-Evans, F.I.C., on "Water—Composition, Pollution and Purification." 8.30 p.m.

ROYAL COLLEGE OF ART, SOUTH KENSINGTON.—Mr. Lewis F. Day, on "Ornamental Design." 11.30 p.m.

ROYAL INSTITUTION.—Mr. Marconi on "Wireless Telegraphy." 9 p.m.

INSTITUTION OF CIVIL ENGINEERS.—Students' visit to the electrical works of the London United Tramways, Limited.

Saturday, February 3.

BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Visit to Drapers' Hall at 3 p.m, Meeting at Carpenters' Hall at 6 p.m.

Monday, February 5.

VICTORIA AND ALBERT MUSEUM (South Kensington).—Mr. Hugh Stannus, F.R.I.B.A., on "The Historic Evolution of Applied Art: XIII.—Mediæval Christian Art." 6 p.m.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Address to students by the President, Mr. William Emerson. Announcement of name of person proposed as a fit recipient of the Royal Gold Medal, 1900. A criticism of the designs and drawings submitted for the Prizes and Studentships, 1899-1900, by Mr. G. F. Bodley, A.R.A. Presentation of Prizes by President. 8 p.m.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—Mr. Edgar Wood, A.R.I.B.A., on "The Experiences of an Architect in the development of Design."

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. Arthur Stratton, A.R.I.B.A., on "Santiago de Compostella."

SOCIETY OF ARTS.—(Cantor Lectures).—Mr. Bennett H. Brough on "Metalliferous Deposits."—III. 8 p.m.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—Prof. J. Lane Notter, M.A., M.D., D.P.H., on "Meteorology." 8 p.m.

SOCIETY OF ENGINEERS.—Presentation of premiums awarded for paper read during the year by Mr. John Corry. President's inaugural address by Mr. Henry O'Connor. 7.30 p.m.

Tuesday, February 6.

GLASGOW ARCHITECTURAL ASSOCIATION.—Paper by Association prizeman.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. Thomas Drew, F.R.I.B.A., on "St. Patrick's Cathedral and its History." 8 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Prof. Francis G. Baily, M.A., A.I.E.E., on "Electric Light Wiring Systems." 8 p.m.

Wednesday, February 7.

SANITARY INSTITUTE.—(Lectures and Demonstrations for Sanitary Officers.)—Mr. John Castell-Evans, F.I.C., on "Soil and Local Physical Conditions." 8 p.m. Inspection and Demonstration of Disinfecting Apparatus and Model Steam Laundry at St. John's Wharf, Fulham, at 3.30 p.m.; conducted by Mr. W. G. Lacy.

SOCIETY OF ARTS.—Mr. Edmund Wilson on "The Housing of the Poor." 8 p.m.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.—Ordinary Meeting at 8 p.m.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—Meeting at 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Council Meeting at 7 p.m. Students' Evening.

TENDERS.

Information from accredited sources should be sent to "The Editor." No results of tenders can be accepted unless they contain the name of the Architect or Surveyor for the Work.

BRIDLINGTON QUAY.—For the erection of a pair of semi-detached and four dwelling-houses, Bessingby Estate, for Mr. A. G. W. Wright. Mr. J. Earnshaw, architect, Carlton House, Bridlington Quay:—

E. Corner	£2,106 0 0
C. Limon	1,956 9 0
W. Barnes	1,680 0 0
E. Wilson	1,591 13 11
Smallwood and Shaw	£1,591 18 9
A. Gardam* ...	1,559 18 8

* Accepted.

[All of Bridlington.]

GLOUCESTER.—For the erection of a coffee house and club for the St. James' (Gloucester) Working Men's Club and Coffee House Company, Limited. Mr. Alfred J. Dunn, architect. Quantities by the architect:—

J. Simmons	£2,660
W. Jones	2,130
J. Williams	1,980
A. J. Dolman...	£1,955
Freeman and Jones ...	1,955
Bailey and Dean* ...	1,899

* Accepted. [All of Gloucester.]

GRAYS.—For the erection of children's cottage homes at Grays, Essex, for the Guardians of the Whitechapel Union. Mr. Christopher M. Shiner, architect, 3, Bond-court, Wallbrook, E.C.:—

G. Sharpe	£12,120
F. Minter	11,869
C. Wall	11,600
F. and E. Davey ...	11,080
H. R. Rous	£10,900
W. Potter	10,836
J. Brown	10,740
J. Hammond*	10,684

* Accepted.

GUILDFORD.—For the erection of schools, Sandfield, for the School Board. Mr. A. J. Sturges, architect, 25, High-street, Guildford. Quantities by Messrs. Franklin & Andrews, Ludgate-hill:—

Potter Bros....	£18,500
John C. Lee	17,651
Frank Milton	17,162
Ernest West...	16,900
P. C. May	16,880
H. Hutchinson	16,860
Stanley Ellis	16,389
Gough and Co.	£16,354
Higlett and Hammond	15,099
A. Johnson	14,945
Mitchell Bros., Shalford, near Guildford*	14,464

* Accepted.

HEREFORD.—For pulling down and rebuilding King's Head Hotel, Hereford, for the Hereford and Tredegar Breweries Company, Limited. Mr. G. H. Godsell, F.S.I., architect, Hereford:—

Beaven & Hodges...	£3,643 0
James Davies	3,562 0
W. Bowers and Co.	£3,498 10
W. P. Lewis and Co.*	3,480 0

*Accepted. [All of Hereford.]

HEREFORD.—For rebuilding the Imperial Tavern, Hereford, for the Hereford and Tredegar Breweries Company, Limited. Mr. G. H. Godsell, F.S.I., architect, Hereford:—

Building Contract.

J. Davies	£4,946 4 6
Beaven and Hodges	4,902 15 0
W. P. Lewis and Co.	£4,794 0 0
W. Bowers and Co.*	4,694 2 0

Decorating, Painting and Plumbing.

Alfred Dutton ...	£525 0 0
H. Barber	479 0 0
J. B. Vaughan*	£433 8 6

*Accepted.

HEREFORD.—For pulling down and rebuilding the "Three Crowns" Hotel, Eign-street, Hereford, for the Hereford and Tredegar Breweries Company, Limited. Mr. G. H. Godsell, F.S.I., architect, Hereford:—

Building Contract.

W. Bowers and Co.	£3,010 0
W. P. Lewis and Co.	2,949 10
Beavan and Hodges	2,940 15
James Davies* ...	2,768 0
Reuben Taylor ...	£2,745 0
W. Powell	2,697 0
C. Cooke. † Withdrawn	2,160 0

Plumbing and Decorating.

J. C. Vaughan	£379 0
H. S. Barber*	£360 0

* Accepted.

[All of Hereford.]

HEREFORD.—Accepted for alterations to Mitre Hotel, Hereford. Mr. G. H. Godsell, F.S.I., architect, Hereford:—

James Davies, Hereford	£595 4

HEREFORD.—For the erection of mineral water works and beer stores, for Mr. F. W. Allen, Black Swan Hotel, Hereford. Mr. G. H. Godsell, F.S.I., architect, Hereford:—

R. Andrews and Son...	£865 0 0
James Davies ...	824 10 0
W. P. Lewis and Co.	£792 0 0
W. Bowers and Co.*	751 17 6

[All of Hereford.]

*Accepted subject to deductions.

OSWESTRY.—For extensions of Market Buildings, construction of an underground convenience, and other work. Mr. G. William Lacey, Borough Engineer and Surveyor. Quantities by Mr. A. Bremner, Colwyn Bay:—

Jones and Evans	£5,794 12 0
E. H. Nicholas...	5,751 3 6
Wm. Felton ...	5,495 11 9
Jabez Higgins ...	£5,188 12 1
W. H. Thomas* (Oswestry) ..	4,990 11 9

[Borough Engineer's Estimate ... £5,700.]

*Accepted.

PRESTON WYNNE (Herefordshire).—Accepted for the erection of new farm building at Lower Town Farm, Preston Wynne, Herefordshire, for the custos and vicars of Hereford Cathedral. Mr. G. H. Godsell, F.S.I., architect, Hereford:—

A. Newbold, Bromyard	£755

SOUTHEND-ON-SEA.—For the erection of the Nelson Hotel, Prittlewell, for Mr. J. Berry. Messrs. Greenhalgh and Brockbank, architects, Bank-chambers, Southend-on-Sea. Quantities by the architects:—

Lyle Co.	£4,675
Shelbourne and Co. ...	3,706
Davis and Leaney ...	3,637
Dupont	3,668
West	3,447
Whur...	£3,190
Davey and Son, Queen's-road, Southend*	3,147

*Accepted.

WEOBLEY (Herefordshire).—Accepted for the erection of new stables at Weobley Vicarage, Herefordshire. Mr. G. H. Godsell, F.S.I., architect, Hereford:—

W. Gibbons, Weobley	£242

CONTRACTS OPEN.

THE Corporation of Middleton invite TENDERS for the BUILDING of their ELECTRICITY WORKS in accordance with plans and specifications prepared by Messrs. LACEY, CLIREHUGH and SILLAR, of 2, Queen Anne's Gate, Westminster, and 78, King-street, Manchester, Electrical Engineers to the Corporation. Plans, sections, &c., may be seen, and specifications, quantities, and form of Tender obtained at my Office on payment of One Guinea, which will be returned on receipt of a bonâ-fide Tender.

Tenders on the prescribed form, with quantities fully priced out, must be properly sealed and endorsed "Tender for Electricity Works," and delivered at my Office not later than WEDNESDAY, FEBRUARY 7th, 1900.

The Corporation do not bind themselves to accept the lowest or any Tender.

FREDERICK ENTWISTLE,
Town Clerk.

Town Hall, Middleton,
January, 1900.

HUNSLET UNION.
TO BUILDERS AND CONTRACTORS.

The Guardians of the Poor of the Hunslet Union invite TENDERS from competent Builders for the ERECTION and COMPLETION of their NEW WORKHOUSE and INFIRMARY at Rothwell Haigh, in accordance with the drawings and specification prepared by their Architect, Mr. J. H. MORTON, F.R.I.B.A., 30, King-street, South Shields.

Applications for bills of quantities and forms of Tender must be made to the Architect, on or before MONDAY, FEBRUARY 5th, 1900, accompanied by a deposit of £5, which will be returned on receipt of a bonâ-fide Tender. Bills of quantities, prepared by Mr. GEORGE CONNELL, of Newcastle-on-Tyne, will be supplied to such applicants only.

Drawings may be inspected, and all information obtained, at the Office of the Architect, and arrangements will be made for inspection of drawings, &c., at the Union Offices, Hunslet.

The Guardians do not bind themselves to accept the lowest or any Tender.

By order,
FRED. W. MEE,
Clerk to the Guardians.

Union Office,
Hunslet, Leeds.
January, 1900.

COMPETITIONS.

BOROUGH of EASTBOURNE.
TO ARCHITECTS.

The Corporation of Eastbourne invite Architects to submit competitive PLANS of an ART, SCIENCE, and TECHNICAL SCHOOL, PUBLIC LIBRARY, FIRE STATION, &c., to be erected at the corner of Water-lane, Eastbourne, at a cost not exceeding £20,000.

Premiums of Fifty, Thirty, and Twenty Pounds will be awarded for the designs adjudged of sufficient merit, and placed first, second, and third in order respectively.

The Corporation will be advised by a professional referee in the selection of the Plans.

The Premiated Plans will become the property of the Corporation.

If any of the premiated Plans be carried out, the Architect may be engaged to superintend the erection of the buildings, in which case the premium will merge in the commission.

Conditions of competition and instructions, with plan of site, will be sent to intending competitors on application to Mr. R. M. GLOYNE, Borough Engineer, on payment of One Guinea, which will be returned on receipt of a bonâ-fide Plans.

Plans must be sent in on or before MAY 1st, 1900.

By Order,
H. W. TOVARGUE,
Town Clerk.

Town Hall,
Eastbourne,
January, 1900.

SVPPLEMENT FOR SVRVEYORS · BVILDERS · SANITARY ENGINEERS ·

JANUARY 31ST, 1900.

BOYLE'S PATENT "AIR-PUMP" VENTILATOR.

THE LATEST PATENT HAS DOUBLE THE EXTRACTING POWER OF EARLIER FORMS AND IS ONE-HALF THE COST.

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See Large Advertisement, Back Page, Monthly.

NON-FLAMMABLE WOOD

Or Wood that has been chemically treated so that it Won't Catch Fire and Won't Spread Flames.

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beg to announce that their works in London, the first erected in Europe, are now complete, and they are prepared to supply Non-Flammable Wood in any quantity.

NON-FLAMMABLE WOOD.

BOARDS HAVE BEEN OFFICIALLY TESTED BY THE BRITISH FIRE PREVENTION COMMITTEE.

The Committee's Report says:—

"No incandescence or spread of flame was observed, nor did the material, as far as could be seen, contribute in any way to the spread of flame. The surface of the boards was charred."

NON-FLAMMABLE WOOD JOINERY and CABINET WORK has been specified by leading Architects, and the Company has fulfilled orders for the Royal Yacht, the Admiralty, the Crystal Palace, Mr. Wyndham's Theatre, etc., etc.

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THE LONDON NON-FLAMMABLE WOOD COMPANY Limited,

Regent House, Regent Street, London, W.

CAST IRON.

By W. R. LETHABY.

An interesting and useful paper was read by Mr. W. R. Lethaby last Friday before a meeting of the Architectural Association, and was followed by an entertaining discussion from several well-known craftsmen in cast-iron. Mr. Lethaby said:—There seems to be no doubt from numerous references that cast-iron was known to the Greeks and Romans; and a large use seems to have been made of it in China from an early time. It is not known whether a knowledge of how to obtain and deal with molten iron was preserved through the middle ages in any part of Europe. Lack of evidence till the fifteenth century suggests rather that it was then reinvented. In all districts where iron was reduced from the ore the iron in the furnaces approached the melting point, but until the blast furnace was discovered the heat was insufficient to cause liquifaction. Analogy with silver, bronze and lead, which were all readily cast, must always have kept the idea of casting iron in the minds of metal workers. Small objects in bronze were cast here from time immemorial; large bells were cast in the twelfth century, and beautiful full-size figures were cast in bronze in the thirteenth.

An approximation to casting iron was made in the stamping of small details while the iron was red hot into swages or moulds early in the thirteenth century. A beautiful example of this kind of work is afforded by the grate of the Eleanor tomb at Westminster, but a door at Windsor has ironwork of this kind in it probably thirty or forty years earlier. This ironwork at Windsor is particularly interesting, as (and I have never seen this pointed out) several seal-like forms have the name Gilbertus stamped on them; this work looks earlier than the Westminster example, and the chapel of Henry III., of which the door was the west entrance, was completed about 1250. It has been suggested that the running of iron into moulds was most desirable for the formation of cannon balls, and we know that cannon were already part of war equipment here, from early in the fourteenth century. Lead shot were first used, and later, as we know, cast-iron. I cannot but think that swaging the balls into shape must have formed an intermediate link.

Dr. Percy, who wrote on the metallurgy of iron, came to the conclusion that mediæval casting in iron was first practised in Prussia. Mr. J. Starkie Gardner, in an excellent paper in "Archæologia" (1898), the best illustrated and most recent contribution to the subject, argues for its origin in the Weald of Sussex and Kent. The contention, however, is, I think, not proven. Many Gothic examples of cast-iron stoves and grave slabs still exist in Germany. One elaborate stove front having figures within cusped panels—a far more important piece than anything in England—was illustrated some years ago by Mr. Brewer, and dated by him 1502. A fire-back at Bruges, dated 1565, of which there is a cast at South Kensington Museum, is a very beautiful design of two figures, cast from a model by a first-rate artist. This again, as a work of art, goes far beyond anything we can show.

The work on which the supposition of an early use of cast-iron in England is in the main founded is the grave slab of Jhone Colins, at Burwash Church, in Sussex. It is a flat slab with a small cross and an inscription in poor lettering of Lombardic character on it. I certainly have been inclined to put this down to the fourteenth century, but the fact that it would then stand alone, the earliest casting in England and probably in Europe, should put us on our guard. Mr. Starkie Gardner says its claim to be the oldest specimen of mediæval cast-iron existing is not disputed, and thus it appears to afford sure ground for the belief that the art of iron casting was invented in Sussex. The statement by Percy that Siegen, in Prussia, was the seat of the discovery, although casting was not practised there until the fifteenth century, has passed unchallenged, but Mr. Gardner thinks it probably contrary to fact. Mr. Gardner goes on to remark very properly that we can hardly suppose casting in iron was invented for the purpose of casting grave slabs, whereas a real and urgent need for castings in iron arose upon the introduction of cannon. Cannon are known to have been used in England from early in the fourteenth century. One exists which is said to be "at least as old as the early part of the fifteenth century," the interior chamber of which is of cast-iron. Now the making of war engines was at this time much developed in Germany and I should expect iron cannon to have been first made there, where, indeed, it is said they were in use early in the fifteenth.

In Stow's Annals under the year 1543 and the heading "First Iron Pieces Cast," he writes: "King Henry, minding wars with France, made great preparation and provision as well of munitions and artillery as also of brass ordinance, amongst the which at that time by one Peter Bawd, a Frenchman born, a gunfounder or maker of great ordinance, and our other alien called Peter van Collen, a gunsmith, both the King's feed men, who, conferring together, devised and caused to be made certain mortar pieces, being at the mouth from 11in. to 19in. wide, for the use whereof the said Peter, and Peter caused to be made certain hollow shot of cast iron, to be stuffed with firework or wildfire, . . . for to break in small pieces the same hollow shot, whereof the smallest piece hitting any man would kill or spoil him. And after the King's return from Boulogne, the said Peter Bawd by himself, in the first of Edward the Sixth, did also make certain ordinance of cast-iron of divers sorts and forms, as fawconet, fawkons, minions, sakers, and other pieces. Unto this Bawd, Lohn Johnson his covenant servant surviving his master did likewise make and cast iron ordinance cleaner and to better perfection, to the great use of this land. His son, Thomas Johnson, is yet living, a special workman. In the year 1595 he made forty-two cast pieces of great ordinance of iron for the Earl of Cumberland, demy cannons weighed three tons apiece." Even cast brass cannons were not made here, Stow says, till 1535, when John Owen began to make brass ordinance. He was the first Englishman, Stow adds, that ever made that kind of artillery in England. The actual founder of the cast iron pieces appears to have been Rafe Hoge; Holinshed says: "This year (1543) the first cast pieces of iron that were ever made in England were made in Bucker-stud in Sussex by Rafe Hoge and Peter Bawd."

Now we cannot traverse such direct and ample evidence as that for the introduction of casting for artillery, and I cannot think there is evidence enough to allow of our supposing that the grave slab of Burwash is any earlier; especially as a family of Collings, ironfounders, lived in the adjacent parish of Brightling. Mr. Gardner, indeed, suggests that the identity of Van Cullen himself, who made the hollow-cast shot in 1543, became merged with the Collings. Retaining the grave slab itself with the preponderating evidence that it can hardly be earlier than about 1545, and, comparing it with several late Gothic firebacks, it seems to me that there is every reason to assign it to this period. The letters on the slab are not good Lombardic ones, and such letters were used by bell-founders to a comparatively late date. Indeed, it is quite possible that they were used as dies, part of an old stock, just as we find Tudor decorations surviving for several generations on other castings. The art of decorating the earliest of these grave slabs and firebacks is strictly analogous to that used by the bell-founder by which separate devices and letters were impressed one by one into the yielding sand-mould. Mr. Gardner notes this, and, calling it a primitive process, says the firebacks decorated by this simple means afford distinct evidence that the art of iron-casting originated in the Weald and developed step by step there, and was not transplanted as a perfected art from abroad. When a sufficient number of backs are grouped together he says they exhibit an evolution from simple to complex. That, of course, is so, if you put the rude ones first; but there is nothing to justify this, and the simple elements of cable border and crossed pieces of cable used in the rudest examples occur again and again in examples which are shown by arms and other devices to be of late Tudor work.

The earliest actually dated are two of 1582. One of the most assuredly Gothic pieces of decoration on these backs is a vine trail along the top of one in a farmhouse at Buxsted, but the field of this same back is occupied by the Crowned Rose of Queen Elizabeth and her initials E. R., and even this last was old stock, for it is cast not in relief, but in matrix, and reversed. An example decorated with strips of vine and birds now on loan at South Kensington is probably the most beautiful of all, and apparently in style one of the earliest. Yet the very same pattern of parallel vertical strips of vine is found on the grave slab of Anne Forster, at Crowhurst, which is dated 1591. Another early fire back at Crowhurst, displaying the crowned royal arms with supporters, probably belongs to this same period—say from 1570 to 1590. Mr. J. C. Horsley, R.A., has an example at Cranbrook of a different type, on which the pattern was formed by circles of tracery pattern, but very shallow and poor; this back is probably no earlier.

The archæology of the subject stands thus. The earliest fire backs appear to be Elizabethan. The earliest grave slabs, which can be dated, belong to the same period, but the ornamentation of one example looks earlier; even if the early design of this were proved, however, it is quite easy to account for by the method of the old founders in using old ornaments. Finally, for cannon, which we might suppose would be the earliest things put into cast-iron, we have the most positive evidence that that was first done in 1543.

I feel some satisfaction in its being established that the use of ornamented cast iron was made by Gothic craftsmen. A reaction which followed Pugin's vital proclamation of principles swerved away from the use of such materials as plaster, cast-iron and whitewash; whereas a true application of true principles would only arraign their misuse fraudulently and thoughtlessly. The true principles of an organic art would proclaim that no material and no method is in itself outcast from the field of art, be it iron, lead, plaster, veneering, graining, casting or anything else. Iron itself, whether wrought or cast, seems to me evidently one of the noblest of materials. There is nothing mean in the idea suggested by the Iron Pillar of Delhi or the Iron Crown of Lombardy, or in the myth of Mahomet's coffin sustained in mid-air by lodestones.

In the composite image interpreted by Daniel iron stood for power: "Strong as iron: forasmuch as iron breaketh in pieces and subdueth all things." Dante built of "the moats profound; that circumvallate that disconsolate city;" and in Chaucer's temple of Mars:—

> Every pillar the temple to sustain
> Was ton-great, of iron bright and shene.

A material in which the poets can design to such effect as that is worthy of the best skill of the artist and craftsmen. Such notices as we have of the use of cast-iron by the ancients refer to its use for statues. Some quite pleasant works of a secondary order of sculpture were cast in iron a generation or two since—sleeping hounds for gate piers, and that sort of thing. The grave slabs spoken of above are no mere curiosities, rough and simple as they are; they are dignified and serious works of art. Fixed flush with the floor the walking over them is just sufficient to give them a little pleasant texture. It seems to me that this use of castings is most appropriate. A comparatively plain slab with just a little meandering border, and the field fretted all over with neatly drawn lettering, should make an excellent memorial, for if we do not continue to bury within our churches their floors might surely well receive memorials.

We cannot have art of any sort without having thoughts to put into it, but, if we had the thought and the material, cast-iron is well fitted to receive them. I am not one of those who wish to see in iron a material for a new architecture, as it is called. Mr. Ruskin, with that insight which made him refuse to talk about the fringe of a subject, saw clearly when everybody was clapping their hands over the Crystal Palace, that the finding and founding of iron is not one of the radically nobler employments, as stone hewing and setting is, or the felling and framing of timber. I would echo every word he says. But while we use iron in some degree, while we even need iron, while even it may grow into wider necessary use, I want to say, let us lend what grace we may to it, so that if obtained with cost, the greatest of all cost, an unkindly labour, it may not be mispent and more than spoilt. For in all these things it is human life we spend; for there is really no other currency.

Cast-iron was largely used in the pleasant and refined manner of building the eighteenth century London house. In the great area from Paddington to Pimlico, and Bloomsbury to Bayswater, there are an infinite number of examples of a quiet and charming taste—railings, balconies, verandahs, with graceful posts and panels of delicate lattice; or inside the house, the grates and stair balustrades were just as good.

The railings begin with the very fine design of the enclosure to St. Paul's, great baluster-shaped forms of beautiful profile; the railings at St. Martins-in-the-Fields following the same model; and there is a late example in Bloomsbury-square, where large rounded posts of this kind are used occasionally between straight uprights. Others have wide pilaster-posts at intervals, like a beautiful railing close to Apsley House in Piccadilly, or others have solid discs placed in the lozenges of lattice work, as on the west side of Lincoln's Inn. Even the ordinary area railing of straight bars has cast knobs and vase-like forms on the top, entirely good in their way, and everything so compact that you never see parts fractured.

The balcony railings are very light—a network of lattice. For perfect fitness, a natural and unashamed treatment of casting in iron, they could not be bettered. We never think of comparing them with wrought-iron to their disadvantage; both are excellent in different categories, and we might as well compare London Bridge to Lady Day, whereas modern castings do invite comparison with wrought-iron, by an infinitely careful ingenuity of pattern-making, emulating just those qualities in which to succeed is only the most of all to fail. For not the line, as in wrought work, the bent rod in scrolls, but the plate, plain or pierced, is the primary fact in design for casting.

Old London verandahs, many of them, are equally excellent, also some of the older lamp-posts. For the stair-railings, the usual plan is to have a wide, flat baluster of open work, one to each step, the metal very thin towards the view, and perhaps beaded. I remember to have seen a wide stone stair of the town-hall at Cherbourg; there was a continuous balustrade of cast plates of iron, pierced with apertures into forms, each edged all round with a delicate raised fillet; it was certainly successful. The French use cast-iron largely, and much of it designed with better taste than our own, and much, I believe, with worse. Where it is the work of one of their abler architects, as in the St. Geneviève Library, or the Northern Station, or the Palais de Justice, it is carefully studied and refined. Doors are also made of it, especially for tombs, and these are suitable, which cannot be said of the elaborate pair of Berlin castings at South Kensington, which may be taken to exemplify the "thou shalt not" of cast-iron. The grates that fill the older houses in London are, for the most part, of excellent design, and remarkable examples of careful casting; some are quite plain, with just a moulding or two, and others are fluted and beaded all over with tiny ornament on flat surfaces; the simplicity of the general forms saves the ornament from being worrying.

Again, let me say, the position I want to make clear as the point of view of these notes is not at all a claim to widen the application of iron, or that it is in any degree superior to other materials. Each material is the best, and our use of iron castings is sufficient, indeed excessive in all probability; but the claim is, that if we elect to use iron, we can do so for the direct "spiritual," if I may so use the word, appeal of the metal to the imagination; or, secondly, if for humbler and utilitarian reasons, it must be good in work and in thought—a work of art. Even the purposes which the worst and most offensive examples have served might, for the greater part, actually have been filled by cast-iron if the work had been naturally done—thought of first as use, then as beauty, and never as an imitation. The ornament, whatever it is, must be a surface decoration of a general simple structural form.

Repetition is of the very nature of cast-work. Repetition of a few simple elements in different combinations made great actual variety possible in old firebricks.

As to surface, rust is without any doubt the natural treatment, and I believe we might well let Nature have it so on occasion. Let us suppose a relief good in design, slight in finish, of the best iron, and absolutely untouched from the mould; put up under some simple pent, it will gradually acquire colour and texture—too much of both you think, but I am not sure. Remember, first of all, how frightened we are of beauty; and that natural colour and naturally-acquired texture are the very adornments to beauty herself. Decay is really much less than we suppose, especially on large rounded surfaces, and with even a small but constant amount of friction the metal keeps free from rust, or probably acquires a weather skin. Posts that block up roadways (of which there are a good many in Bloomsbury!), or the parapet of Westminster Bridge are examples; internal work, like the finely-designed gratings in Kensington Museum, becomes quite polished with ordinary wear.

Galvanising, the modern version of the tinning, which, applied to iron, is as old as Theophilus, is a valuable process. Galvanising and good oil gilding right over the surface would probably be a perfect protection, or the galvanising might be lacquered and varnished.

Electro-bronzing is another available method of which the French make use, and the dogs at Kensington are examples. We find it possible to get Japanese workmen here to furnish out a shilling show. Would it not be possible to get one or two to instruct us in their processes in iron working, and especially in finishing and colouring the surfaces? For some work oiling or varnishing may be sufficient; in many cases, of course, painting is really necessary, and for this I would recommend white, grey or black as constant colours. Simple black-leading, too, is to be entirely approved.

Some old grates are inlaid with brass, which forms flush patterns on the surface. Lead might also be suggested for inscriptions in flat slabs, and might be merely beaten into the hollows left in the casting; or even cements and mastics might be so inlaid, if only properly designed.

By way of moral I will sum up thus: (1) In designing we should give up attempts at the artistic; it is apt to miss fire. The thing to aim at is an elegant kind of engineering, straight to the point, simple and honest. Things should be finished to make them appear comfortable, as it were. (2) The forms, either solid or flat, should be homogeneous, approximating to a cylinder or a flat panel or lattice. Where modelling is applied, there should be a good space of level field, as in a coin, and the modelling, so far as possible, like a coin, should be of equal weight throughout. (3) We want exactly tabulated information as to how castings, simply treated, behave when exposed to weather without paint. We should aim at leaving the castings untouched from the mould. The Japanese in delicate kettles and the like leave the seams on; we should do the same with our bigger objects. We want to proclaim the casting, not to disguise it. (4) We should give up painting external objects Indian red, the worst of all colours for the purpose. Black or white or green are the best colours. (5) We should try to learn how the surfaces of Japanese castings are treated.

Mr. L. A. Shuffrey, in opening the discussion on Mr. Lethaby's paper, said it was singular how slowly cast-iron had emerged from he slough of detestation into which it was thrown by the Gothic Revivalists, and this was more particularly the case where it had been possible to use wrought-iron in its place, as in gates and railings, although cast-iron was much less readily affected by the London atmosphere than wrought-iron. Examples of good design in cast-iron were few, and even the vase or urn-shaped finials in combination with wrought rails and standards were fast disappearing as houses were pulled down in Marylebone and elsewhere. There were good cast standards in front of the old Portland-stone houses on the north side of Cavendish Square and at the corner of Henrietta Street and Welbeck Street consisting of a square pedestal with long fluted shaft above, and finished with a vase-shaped finial. These cast pillars at the angles of wrought-iron railings had a good effect, giving an appearance of stability which was wanting in a plain iron standard, and they were a pleasant contrast to the straight bay. Wrought and cast-iron had such different qualities that it would be generally found almost necessary to use them in combination. For monumental buildings cast-iron railings might be of massive design; they generally erred on the side of lightness. It was singular that with the amount of designing talent there was about our public lamp-posts should be so commonplace in design; the general form was no doubt a survival of the fittest, but the detail might well be improved. The electric light standards were a comparatively new feature in cast-iron design, but had not, so far as he was aware, got into good hands. There had been a great improvement in the form of pipe heads in cast-iron, many of the forms being taken from the old lead heads. They were less satisfactory than the lead ones in requiring painting, generally from frequently awkward positions, but, as down pipes were generally of iron also, it was as easy to paint the one as the other. For fire grates and stoves cast-iron was quite the best material. It could be left with the surface with which it came from the sand, this surface taking black-lead well; or the skin could be removed by the file or emery wheel, and blacked or left bright. On account of seams which showed unpleasantly on a plain surface it was customary to break up this surface with flutes, reeds, or fine ornaments, which had a good effect. This was carried out with good effect and with great refinement in the old double semi-circular grates of the last quarter of the last century, particularly by the Carron Company. Many of these had been broken up, but there were still plenty to be seen, and they certainly showed that design in cast-iron was at that time well understood.

Mr. H. Longden thought Mr. Lethaby had covered the ground very thoroughly. He showed a grate by Mr. Lethaby, for which the original model had been done in wood, which was worked upon with gesso, but carving in wood or modelling in wax might be used, according to the kind of work to be done. Sometimes plaster models cast from clay modelled work were the best to be used. There were rules to be observed as to thicknesses and specification in castings. No very great variations in thickness should be made in any castings, as these caused unequal shrinking in the cooking of the casting, and "pulled it to pieces"—to use the workshop term. Under-cutting should not be undertaken in cast-iron. It was now again recognised that cast-iron had its appropriate comeliness when properly treated; this was understood a hundred years ago. Cast-iron ought to look like itself; to do what only itself would do, and not to imitate stone, wood, plaster, or work in wrought-iron. When it was so handled it had what he might call its appropriate beauty.

Mr. R. Moreland said cast-iron and steel were both iron which had a certain combination of carbon in it. This combination might be made by mixing, in a mechanical way or chemically. When cast-iron or steel was chilled by being placed hot into water, the mechanical mixture became a chemical one and caused it to harden. The principal thing that happened many years ago was when Bessemer determined how to burn the carbon out of the cast-iron, and thus to produce nearly pure iron. This nearly pure iron he then made into steel by adding carbon. This removal of carbon could be done by putting cast-iron into a warmed bath of liquid containing oxygen; when thus treated it became capable of being bent, and was known as "malleable cast-iron."

Mr. G. H. Fellowes Prynne, the chairman, thought that the cast-iron fire backs treated in low relief were, generally speaking, better than those in high.

Mr. Beresford Pite referred to Mr. Lethaby's description of designing in cast-iron as elegant engineering as particularly apt, and thought architecture was merely sanctified engineering. It seemed to him that artistic design in cast-iron was merely a question of the suitability of the model; therefore, a consideration of what would be suitable in low-relief carving in wood would be suitable to cast-iron. He proposed a vote of thanks to Mr. Lethaby, Mr. Shuffrey, Mr. Longden, and to Mr. Moreland.

Mr. Leonard Stokes, in seconding the motion, said the thing which had struck him most had been the remark by Mr. Lethaby as to making cast-iron comfortable. The term "comfortable" appealed to him immensely; it expressed the qualification that seemed to be required in cast-iron—that of giving something you could stroke. Mr. Pite had said that it did not matter in what you modelled, whether in wood or in gesso. Mr. Stokes thought this was absolutely wrong; he did not see how carving in wood would produce a comfortable effect.

After Mr. Walter Millard, Mr. H. C. Eyres, Mr. W. H. Seth-Smith and Mr. E. Herbert had made a few remarks, the vote of thanks was carried, and the meeting terminated.

Heavy Failure of a Builder. — On January 23rd the public examination of Mr. R. Tomlinson, builder, of Adam Street, Adelphi, was held. The accounts showed a total indebtedness of £76,523, of which about £6,600 was stated to be unsecured; and an estimated surplus of £4,143. The hearing was adjourned.

Workmen's Compensation: What is a Wharf?—This question came up for solution in the recent appeal case of *Haddock* v. *T. Humphrey*. The plaintiff appealed from the refusal of the Liverpool County Court judge to award her compensation under the Workmen's Compensation Act for the loss of her husband, who was killed while in the employ of the defendants, carters, of Liverpool, at the timber yard of Messrs. Parker in Canada Dock. The points for consideration were: (1) Was the place where the accident occurred a wharf within the meaning of the Factory and Workshops Act, 1895? and (2) was the machinery—an overhead crane—which was used on the premises machinery within the meaning of that Act? Counsel explained that the yard of Messrs. Parker was about 150 yards from the waterline at Canada Dock. Behind the quay was a roadway, and behind the roadway were situate the offices of the timber merchants who had timber yards immediately in the rear. The county court judge held that the words "quay" and "wharf" were absolutely identical, and that the wharf ended at the beginning of the roadway in front of the offices and timber yards. He, therefore, decided that the yard of Messrs. Parker, where the accident happened, was not a wharf within the meaning of the Workshops Act, and that the plaintiff could not recover compensation for the death of the deceased under the Compensation Act. The plaintiff contended that any place in a dock which was not covered over, and where goods were stored, was a wharf, and that, therefore, the yard of Messrs. Parker was part of the wharf in Canada Dock. Lord Justice Smith, in giving judgment, said the conclusion he had arrived at was that the place where the accident occurred was a timber yard and not a wharf. In his view the word "wharf" meant a place which had something to do with water; it did not include a yard which was cut off from the piece of land, which, in his opinion, was the wharf at Canada Dock. The appeal was, therefore, dismissed with costs.

Surveying and Sanitary Notes.

The Estate of the late Sir Richard Thorne Thorne has been valued at £8,371 gross—£4,621 net personalty.

"Sanitation in Tenement Dwellings" was the title of a paper read before the Architectural Association of Ireland last week by Sir Charles Cameron. He said that for more than twenty years past he had held tenaciously to the opinion that the water system of conveying away filth from cities was the best. The great difficulty was in the wanton carelessness of the occupiers of tenement houses in the use of the sanitary accommodation provided for them, resulting in the flow becoming blocked. He recommended the use in outside closets of a trapless closet, on even a layer of asphalt, which, unlike concrete, was impervious to air or moisture. Mr. W. Kaye Parry said he found that where there was only one family in a dwelling the water system worked very well. The following new members were elected:—Messrs. John Knox Vinycomb, G. Hamilton Bailee, G. F. Beckett, and John Donohoe.

Manchester Sewage Problem.—In the supplement to our issue for November 22nd last we gave particulars of the recommendations made by the three experts (Messrs. Baldwin Latham, Percy F. Frankland, and W. H. Perkin, junior) appointed to advise on a comprehensive sewage scheme for Manchester. By these, and later, recommendations it is proposed "that an area of not less than 92 acres of filter beds shall be provided for the treatment of sewage by double contact." The Mersey and Irwell Joint Committee have since declined to entertain the suggestion that they should be satisfied "for a limited period with working trials of six acres of bacterial beds," and wish the whole of the sewage to be dealt with at once. The Manchester Rivers Committee propose to ask the Council to give full effect to the experts' reports, including the raising of the level of the existing tanks and the provision of four additional ones.

Claim for Altering Road Levels.—At the Norfolk and Norwich Assizes on January 23rd the case of *Hotblade and others* v. *The Norwich Electric Tramways Company* was heard before Mr. Justice Ridley and a special jury. According to the statement of claim, the plaintiffs own two houses and shops on Orford Hill, Norwich, and a piece of ground in the rear. The defendants have built a new street so that it crosses Orford Hill, raising the pathway in front of the plaintiffs' property 2ft. 10in., and so altering the levels; and the plaintiffs claimed that access to their property had thus been rendered difficult and inconvenient, and the traffic had been largely diverted. In respect of these injuries they claimed £600 damages, and an injunction ordering the defendants to restore the street to the proper level. His Lordship, in summing up, referred to the jury the following questions:—(1) Who did the work? (2) If the defendants, had they done such work as entitled the plaintiffs to claim damages? And (3) if so, what were the damages? The jury found that the work was done by the Corporation with the knowledge of the Company, and that the plaintiffs' property had sustained no damage. His Lordship said this amounted to a verdict for the defendants.

Traction Engines and Extraordinary Traffic.—At the Leicester County Court on January 23rd his Honour Judge Wightman Wood gave his decision in the case of the *Leicestershire County Council* v. *William Atkins*, brickmaker, of Mountsorrel, which was a claim by the former for £200 on account of damage done to the Loughborough Road through extraordinary traffic and excessive weight put upon it by the respondent. His honour, dealing first with the question of law, held that the traffic in question was extraordinary and the weight excessive within the meaning of the Highways and Locomotive Act. It was true that the aggregate weight of bricks (about 5,400 tons) carried over the road during the past year was the same as in the years when no damage was said to have been done, but the fact that a traction engine was now used, and a greater weight carried at one time, brought the mode of uses of the road within the meaning of the Act. (The traction engine weighed 11 tons, and the trucks, full of bricks, weighed about 10 tons. Two or three trucks were coupled to the engine.) He held, too, on the evidence as to facts, that damage had been done, but not to the extent for which the County Council claimed. There was no doubt in his mind that the road in question was during the last year made much stronger and better than in previous years, but there was no legal obligation upon the County Council to do that, and it was not an inevitable consequence of the use of the traction engine upon the road. Taking this into consideration, he gave judgment for plaintiffs for £105.

Engineering Notes.

Electroid Gas, the new illuminant, first introduced at Hunmanby, Yorks., has been interdicted by the Local Government Board as dangerous to the public.

Mr. Edward A. Harman, M.I.C.E., gas engineer to the Huddersfield Town Council, has been voted an increase of salary of £100 per annum from January 1st last, with an additional £100 increase from January 1st next.

Waterworks for Whaley Bridge.—The Whaley Bridge Urban District Council have decided to construct waterworks for their district, at an estimated cost of £7,000; they intend to construct a service reservoir to contain 247,000 gallons. It is expected that a sewerage scheme will follow.

The Decease of Professor D. E. Hughes, F.R.S., took place last Monday week. He was one of the most distinguishing electricians, and, among other things, invented the type-printing telegraph instrument known by his name. In 1886 he served as president of the Institution of Electrical Engineers.

A Notable Scotch Bridge.—The greatest engineering feat, perhaps, ever attempted in the Highlands is the railway bridge now in course of construction over Loch Etive, at the Falls of Lora. When completed, its span of 500ft. will be the second largest in Europe, coming next to that of the Forth Bridge. Sir J. Wolfe Barry, K.C.B, is the designer; and the entire superstructure will be of steel.

Electric Light at Govan, N.B., has been provided. The installation is on the three-wire continuous current 250-volt system and has cost about £26,000, which is about £8,000 in excess of the estimate. There are two boilers by Babcock and Wilcox; electrical machinery by the British Thomson-Houston Company; accumulators by The Tudor Company; cables by the Callander Company; and arc lamps by Crompton and Company.

Institution of Mechanical Engineers.—At the fifty-third annual general meeting of this Institute, held on Friday last (the president, Sir William H. White, in the chair), the annual report was presented. This shows that at the end of last year the membership was 2,922, as compared with 2,684 for the previous year; but there has been an excess of expenditure over revenue of £453 11s. 7d. The sum of £59,214 0s. 7d. has now been spent on the Institution House, which is the chief cause of the excess expenditure.

Masters and Men.

A Strike at the Paris Exhibition.—The carpenters employed on the Paris Exhibition buildings have struck for an increase of wages.

National Building Trades' Federation.—At the forthcoming conference of this Federation in London, the following gentlemen will represent the Bradford Builders' Association: Alderman Wm. Holdsworth, Mr. P. Drake, Mr. Wm. Moulson, Mr. A. Moulson, Mr. A. Gadie, Mr. Obank, and Mr. Copley.

Reduction of Wages in Dundee.—A movement has been started throughout Scotland to reduce the wages of the workmen in the building trades—joiners, masons, plumbers, painters, slaters, and plasterers—and in several districts intimation has already been made that the wages are to be reduced to the extent of 1d. per hour. Last week the members of the Dundee Master Builders' Federation agreed that a reduction of 1d. per hour should be recommended all round in the various branches of the trade, and to bring it into effect according to the terms of the by-laws in force between the employers and employed. In the case of the plasterers, however, it was stated that they had a Federation of their own, and before any steps could be taken in regard to that trade the Federation would have to be consulted. It is stated that the present position of the trade was not satisfactory. Old contracts are being worked off, and very few new ones are forthcoming; while the price of material is on the increase, the cost of certain kinds of wood, for instance, having risen ten per cent. since the New Year.

The Trades Union Congress will meet at Huddersfield in September, and arrangements for the reception of it are now busily being made by the Huddersfield Trade and Labour Council. All the local arrangements necessary for the lodgment and entertainment of the delegates will be carried out by committees of the Council, which, as a body, has already secured from the Town Council the promise of the free use of the town hall for the transaction of congress business. The hall is as convenient as it is commodious, and well suited for a gathering of the kind, having a large platform and an orchestra, so called, for the accommodation of speakers. The Trades Council have appointed finance, reception, and entertainment committees. The first-named committee, probably, will secure their funds chiefly by means of donations from within their own body. The local trades unionists number about 4,000, and it has been suggested that each member should contribute one shilling to the Local Expenses Fund, and it is believed that the sum thus secured would be sufficient to meet all the demands that would fall to the local Trades Council to bear. Members of some trades would not be able to contribute so much and others would probably contribute more.

Strike of Plasterers.—Last week the Scarborough plasterers struck work because of the refusal of the masters to sign their rules with the London agreement embodied. The Scarborough masters did not join the national lock-out of plasterers last spring on the ground that they had no grievance, and were not affected, and because the majority of union plasterers in the town were not employed by members of the masters' association. A settlement of that dispute was arrived at in May, but as the Scarborough masters had not joined in the lock-out they contended they were not bound by the settlement. At this time, owing to the Hull dispute, a lock-out was ordered of all trades by the Yorkshire Federation of Builders, and the Scarborough masters joined in the lock-out, which included 25 per cent. of plasterers. The result was that the whole body of union men came out. Eventually an agreement was arrived at, and they returned to work. The plasterers contend that the rules which applied to their trade were rendered null and void, and that new rules should be drawn up, in which the London agreement should be incorporated. This the masters declined to do, alleging that the agreement with reference to the demarcation of work and that with reference to the number of apprentices were not feasible in Scarborough. The masters have resolved, in face of the strike, that no union plasterers employed either by contractors or sub-contractors shall be allowed to work on works under the control of members of their association, and they further declare that the national rules are not workable in Scarborough and district.

Builders' Notes.

Advance in Prices for Baths, Lavatories, &c.—Messrs. Morrison, Ingram and Co., Ltd., sanitary engineers and brass and iron founders, of Hadfield Street, Cornbrook, Manchester, inform us that they are again compelled to advance the prices of some of their manufactures as follows:—Fine cast, plain painted 3rd and 2/2nd class baths (discount reduced 5 per cent.; the higher qualities remain for the present as advised August 10th, 1899); lavatories and sinks (discount reduced 5 per cent.); water-closets, cisterns and flushing tanks (discount reduced 10 per cent.).

Messrs. Julius Sax and Co., Limited.—In our issue for January 10th we stated that this firm had intimated to us their willingness to send a copy of their new calendar to any of our readers who would communicate with them. A correspondent writes expressing some annoyance that his request for a copy was not complied with by Messrs. Sax, who said that they would send the calendar on receipt of a "trade card." It is, of course, not unusual to confine such offers to the trade, but we agree with our correspondent that some trouble and disappointment would probably be avoided if an intimation of the offer being so restricted had been made in the first instance.

Covering Manholes: Damages Against a Builder.—In the Dundee Sheriff Court on January 23rd, John Rodgers, a labourer, sued Robert Laing, a builder, for £12 as damages in respect of personal injuries. He averred that on November 11th he fell through a manhole in Rattray Street, owing to its not being sufficiently covered by the defendant. It was pleaded that it was no part of the plaintiff's business to go near the manhole. The sheriff found for plaintiff for £3 and 10s. costs, and said that, even though it was no part of the plaintiff's duty to go near the manhole, defendant was at fault in allowing it to remain accessible to him.

Paper Roofs.—In connection with the statement that the Tokyo Card and Pasteboard Company, the largest in its line in Japan, were making a thick, tarred pasteboard as a substitute for shingles in roofing, the "Indian Textile Journal" says that what is required for the production of cardboard is a supply of coarse fibre and a cement to hold it together. India lacks neither of these, although they have not yet received sufficient attention. The uses of a strong and well-made cardboard include boxes, panels, partitions, roofing, ceilings, bookboards, and advertisement cards of all sizes. The tarred cardboard would not suit on a roof in India on account of its disposition to heat in the sun and soften. It would also require to be prepared with pitch of very high melting point to stand even the shade temperature. A paper roof would be far superior to sheet iron as a protection against the sun, and paper panels with an embossed device on them would offer a very neat, light and substantial filling as panels for screens.

London County Council.—At the reassembling of the Council on Tuesday in last week the Housing of the Working Classes Committee reported that they had framed a scheme, at an estimated cost of £500,000, for the erection of cottage dwellings at Totterdown Fields, Tooting. They recommended that the Council should purchase the estate of 38½ acres at a cost of £45,000. The proposed cottages would each provide for two families, and would consist of two self-contained tenements, one of two and one of three rooms. Separate gardens would be provided for each tenement, and, on an average, not less than thirty cottages would be built to the acre. The report was agreed to. The Finance Committee brought up a report showing that during the half-year ended September the completed works had cost £23,376 19s. 3d., as against an estimate of £23,964 17s. 7d. The total amount spent on the jobbing works was stated to be £36,275 19s. 7d., as against a schedule value of £38,929 13s. 4d. The report also showed that the total estimated cost of all works carried out since the establishment of the Works Department was £838,642, as against a total cost of £883,232, thus showing a loss of £44,590. Mr. Beachcroft pointed out that the loss on artizans' dwellings alone was £19,300. The Improvements Committee recommended the adoption of the estimate of £2,742,500, the balance of the cost of property and re-housing in connection with the new street from Holborn to the Strand. A sum of £2,000,000 was voted in August last. This was agreed to.

COMPLETE LIST OF CONTRACTS OPEN.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—		
Feb. 2	Derby—Offices	Midland Railway Company	Engineer, Derby Station.
,, 3	Newton Rigg—Brick Water Tank	Committee of Governors	G. D. Oliver, County Architect, Carlisle.
,, 3	Queenstown, Ireland—Schools	Rev. Dr. Brown	S. F. Hynes, 21, South Mall, Cork.
,, 5	Hunslet—Workhouse and Infirmary	Union	J. H. Morton, 50, King-street, South Shields.
,, 5	Clacton-on-Sea—Brick Gasholder Tank	Gas and Water Committee	S. Francis, Engineer, Town Hall, Clacton.
,, 5	Croydon—Fitting-up Library	Joint Library Committee	E. Haslehurst, 7A, Lawrence Pountney-hill, E.C.
,, 6	Bradford—Memorial Hall	Corporation	J. H. Cox, Town Hall, Bradford.
,, 6	Darwen, Lancs.—Store	Co-operative Society, Limited	Woods and Thackeray, Architects, Darwen.
,, 6	Fleetwood, Lancs.—Conveniences	Urban District Council	E. Frobisher, Surveyor's Office, Town Hall, Fleetwood.
,, 7	York—Offices	North Eastern Railway Company	W. Bell, Architect, York.
,, 7	Middleton—Electricity Works	Corporation	Lacy, Clirehugh and Sillar, 2, Queen Anne's Gate, S.W.
,, 7	Hebburn—Alterations	Urban District Council	J. B. Renton, Surveyor, Argyle-street, Hebburn.
,, 7	Hull—Stables	North-Eastern Railway Company	Stationmaster, Paragon Station, Hull.
,, 8	Camberwell—Stables, &c.	Vestry	Surveyor's Office, Vestry Hall, Camberwell.
,, 9	Rugby—Post Office	H.M. Office of Works	Office of Works, Storey's Gate, S.W.
,, 9	New Brompton, Kent—Houses	....	F. Smith, Architect, Bank-chambers, New Brompton.

COMPLETE LIST OF CONTRACTS OPEN—*continued.*

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDER MAY BE OBTAINED.
	BUILDING—*Continued.*		
Feb. 10	Burnley—Refuse Destructor	Urban District Council	J. Gregson, Surveyor, Council-chambers, Padiham
,, 12	Preston—Alterations	Corporation	Borough Surveyor, Town Hall, Preston.
,, 12	Ilford—Sheds	Urban District Council	Surveyor, 7, Cranbrook-road, Ilford.
,, 13	Eastbourne—Mortuary	Lighting & General Purposes Committee	W. C. Field, Architect, Town Hall, Eastbourne.
,, 13	London, W.—Coal Office	Great Western Railway Company	The Engineer, Paddington Station.
,, 14	Gosport—Public Library	District Council	The Surveyor, Council Offices, Gosport.
,, 19	Egham—Additions to Schools	School Board	J. A. Engall, Clarence-street, Staines.
,, 22	St. Thomas, near Exeter—School	School Board	I. Champion, Council Offices, Cowark-street, St. Thomas.
,, 27	Westminster—Artizan's Dwellings	London County Council	The Architect, 17, Pall Mall East, S.W.
March 25	Thorndon, Suffolk—Shed	....	F. C. Foster, Thorndon.
	ENGINEERING—		
Feb. 3	Fulham—Sinking Wells	Vestry	W. J. H. Denselow, Town Hall, Walham Green.
,, 3	Keighley—Electrical Plant	Corporation	J. M. Smith, Engineer, Bridge-street, Keighley.
,, 3	Exeter—Septic Tanks	Council	G. R. Shorto, Town Clerk, Exeter.
,, 3	Bradford—Electrical Equipment	Tramways Committee	City Surveyor, Town Hall, Bradford.
,, 5	Wimbledon—Roof	Urban District Council	C. H. Cooper, The Broadway, Wimbledon.
,, 5	Glasgow—Cranes	Corporation	J. Young, Manager, 88, Renfield-street, Glasgow.
,, 5	London, E.C.—Underground Conduits	Postmaster-General	C. E. Stuart, Controller of Stores, G.P.O., E.C.
,, 5	Tunbridge Wells—Boilers	Corporation	H. Boot, Engineer, Town Hall, Tunbridge Wells.
,, 5	Winkleigh, Devon—Bridge	County Council	H. Michelmore, Clerk, County Council Office, Exeter.
,, 6	Wath-on-Dearne, Yorks.—Heating	Hospital Board	W. T. Campsall, 19, Figtree-lane, Sheffield.
,, 6	Caistor, Lincs.—Water Supply Works	Rural District Council	Croft and Bentley, 21, Osborne-street, Grimsby.
,, 7	West Ham—Electric Plant	Guardians	F. E. Hilleary, Workhouse, Leytonstone.
,, 8	London, N.—Destructor, Cells, &c.	Wood Green District Council	G. J. Gunyon, Town Hall, Wood Green.
,, 8	Sudbury, Suffolk—Boiler	Waterworks Committee	T. W. A. Hayward, Engineer, Town Hall, Sudbury.
,, 8	Belfast—Dynamos	Electric Committee	V. A. H. M'Cowen, City Electrical Engineer, Belfast.
,, 8	Mullingar, Ireland—Heating	....	Clerk of Works, New Buildings Lunatic Asylum, Mullingar.
,, 9	West Ham—Electric Lighting Plant	Union	Clerk, Union Workhouse, Leytonstone, E.
,, 10	Padiham—Bridge	Urban District Council	J. Gregson, Surveyor, Council Chamber, Padiham.
,, 12	Todmorden—Reservoir	Corporation	Town Clerk, Town Hall, Todmorden.
,, 12	Edinburgh—Gas Exhausters	Gas Commissioners	W. R. Herring, Engineer, Edinburgh.
,, 12	Southall, Middlesex—Fire Engine	Urban District Council	H. R. Felkin, Engineer, High-street, Southall.
,, 12	Bath—Electric Lighting Plant	Corporation	G. F. Metzger, 7, Dorchester-street, Bath.
,, 13	Bickley, Salop—Waterworks	Rural District Council	J. A. Davenport, 152, Hospital-street, Nantwich.
,, 15	Great Yarmouth—Dynamos and Boilers	Corporation	Preece and Cardew, 13, Queen Anne's-gate, Westminster.
,, 16	Cwm Brombil, Wales—Reservoir	E. Knox	J. Taylor, Sons and S. Crimp, 27, Great George-street, S.W.
,, 16	Lydford—Water Supply Works	Rural District Council	G. D. Bellamy, 6, Courtenay Street, Plymouth.
,, 19	Hull—Cars	Corporation	A. E. White, Tonw Hall Hull.
,, 19	Loughborough, Leics.—Reservoirs	Corporation	G. V. and F. W. Hodgson, Engineers, Loughborough.
,, 22	Ludlow—Converting	Union Gas Co.	W. H. Whitehouse, Manager, Union Gas Co., Ludlow.
,, 22	Ludlow—Purifiers, &c.	Union Gas Co.	W. H. Whitehouse, Manager, Union Gas Co., Ludlow.
Mar. 1	Melbourne—Electric Lighting Plant	Corporation	Agent-General for Victoria, 15, Victoria-street, Westminster.
	IRON AND STEEL—		
Feb. 3	Warrington—Pipes	Corporation	J. Deas, Engineer, Bank House, Warrington.
,, 5	Wimbledon—Roof	Urban District Council	C. H. Cooper, Engineer, The Broadway, Wimbledon.
,, 8	Langport—Staircases	Guardians	E. Q. Lough, Clerk, Guardian Office, Langport.
,, 8	Aberdare—Pipes	Urban District Council	Surveyor, Town Hall, Aberbare.
,, 12	Edinburgh—Ironwork	Gas Commissioners	W. R. Herring, Chief Engineer, Edinburgh.
	PAINTING AND PLUMBING—		
Feb. 3	Halifax—Painting	....	W. C. Williams, 29, Southgat
,, 5	Manchester—Painting	Lancashire and Yorkshire Railway Co.	Engineer, Hunts Bank, Ma
	ROADS AND CARTAGE—		
Feb. 3	Escrick, Yorks.—Materials	Rural District Council	F. A. Camidge, 3, Stonegate.
,, 3	Gower, Swansea—Widening	Rural District Council	H. J. Ind, Victoria Chambers, Oxford-street, Swansea.
,, 3	Norwich—Granite	County Council	T. H. B. Heslop, County Surveyor, Norwich.
,, 5	Midhurst, Sussex—Various	Rural District Council	A. G. Gibbs, Council Offices, Midhurst.
,, 5	London, N.—Road Works	Finchley Urban District Council	Council Offices, Bibbsworth House, Church End, Finchley, N.
,, 5	Leeds—Road Works	Rural District Council	E. J. Silcock, 10, Park-row, Leeds.
,, 5	Warrington—Forming and Paving	Paving and Sewerage Committee	T. Longdin, Surveyor, Town Hall, Warrington.
,, 5	London, W.—Sand, Shingle, and Cement	Paddington Vestry	Surveyor, Vestry Hall, Harrow-road, W.
,, 5	Bermondsey—Granite Pitching	Vestry	R. J. Angel, Bermondsey Town Hall, Spa-road, S.E.
,, 6	Lewisham—Roads	Board of Works	Surveyors Department, Town Hall, Catford.
,, 6	Willesden—Private Streets	District Council	O. C. Robson, Public Offices, Dyne-road, Kilburn.
,, 6	Bicester—Carting	Rural District Council	C. W. Brabant, South View, Bicester.
,, 6	London, S.W.—Materials	Commissioners H.M. Works	H.M. Office of Works, Storey's Gate, S.W.
,, 6	Mountain Ash, Wales—Works	Urban District Council	Surveyor, Town Hall, Mountain Ash.
,, 7	Ashton-in-Makerfield—Materials	Urban District Council	J. W. Liversedge, Council Office, Ashton-in-Makerfield.
,, 7	Bicester—Stone	Rural District Council	C. W. Brabant, South View, Bicester.
,, 8	Seaford—Street Works	Urban District Council	Surveyor, 3, Clinton-place, Seaford.
,, 10	Sheringham, Norfolk—Streets	Rural District Council	Mr. Nightingale, High-street, Sheringham.
,, 12	Banbury—Stones	Rural District Council	E. L. Fisher, Horse Fair, Banbury.
,, 12	Hebburn—Street Works	Urban District Council	J. B. Renton, Argyle-street, Hebburn.
,, 14	South Shields—Granite	Corporation	S. E. Burgess, Chapter Row, South Shields.
,, 14	Fleetwood, Lancs.—Tar Paving	Urban District Council	E. Frobischer, Surveyor, Town Hall, Fleetwood.
,, 14	Chester-le-Street—Road	Rural District Council	D. Balfour & Son, 3, St. Nicholas-bldgs., Newcastle-on-Tyne
,, 14	South Shields—Material	Corporation	S. E. Burgess, Engineer, Chapter-row, South Shields.
,, 22	Lowestoft—Materials	Rural District Council	A. J. Firby, Ivy Cottage, Carlton Colville, Lowestoft.
March 23	Ipswich—Materials	Rural District Council	J. J. White, Surveyor, Needham Market.
	SANITARY—		
Feb. 2	Barking, Essex—Stoneware Pipes	Urban District Council	C. F. Dawson, Surveyor, Barking.
,, 5	Malden—Sewer	Urban District Council	T. V. H. Davison, Engineer, New Malden.
,, 5	Crail, Scotland—Sewers	Commissioners	Belfrage and Carfrae, 1, Erskine-place, Edinburgh.
,, 5	Erith—Sewer	Urban District Council	Surveyor, District Council, High-street, Erith.
,, 7	Ashton-in-Makerfield—Sewerage Works	Urban District Council	J. W. Liversedge, Council Offices, Ashton-in-Makerfield.
,, 7	Tiverton, Devon—Sewers	Corporation	J. Siddalls, Engineer, Town Hall, Tiverton.
,, 9	Ulverston—Sewerage Works	Rural District Council	C. W. Dean, 3, Benson-street, Ulverston.
,, 13	Bury, Lancs.—Sewer	Sewage Committee	A. W. Bradley, Engineer, Corporation Offices, Bank-street, Bury.
,, 16	Tavistock—Sewers	Rural District Council	C. D. Bellamy, 6A, Courtenay-street, Plymouth.
	TIMBER—		
Feb. 5	London, W.—Wood Blocks	Paddington Vestry	Surveyor, Vestry Hall, Harrow-road, W.

COMPETITIONS OPEN.

DATE DESIGNS TO BE SENT IN.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	BY WHOM ADVERTISED.
Feb. 12	Barnsley, Yorks.—Church and Vicarage	£52 10s., £31 10s., £21	Lancaster and Sons, Church-street, Barnsley.
,, 22	Luton—Homes	£21	W. Austin, Clerk, Union Offices, Luton.
,, 28	Findochty, Scotland—Harbour Improvements	....	Clerk of Commissioners, Findochty, Scotland.
,, 28	Doncaster—Isolation Hospital	£25, £15	F. E. Nicholson, Solicitor, Union Offices, Doncaster.
Mar. 12	Belfast—Assembly Hall	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast.
,, 31	Walsall—Municipal Buildings	£100 awarded to each selected competr.	J. R. Cooper, Town Clerk, Borough Offices, Walsall.
,, 31	Springfield, Essex—Constabulary Headquarters	£100, £50, £25	H. W. Gibson, Shire Hall, Chelmsford.

Property and Land Sales.

FREEHOLD BUILDING LAND to be LET on LEASE, or SOLD in PLOTS; fronting on main road and close to golf links and Highgate Woods; near M[illegible] Hill and East Finchley Stations. Liberal adva[illegible] [illegible]quired to responsible Builders.—For plans and particulars apply to Mr. GEORGE H. PAINE, Architect and Surveyor, 6, Stoke Newington Road, N. 3

Sales by Auction for the Year 1900.—Messrs.

DEBENHAM, TEWSON, FARMER, and BRIDGEWATER beg to announce that their SALES for 1900 of ESTATES, Investments, Town, Suburban, and Country Houses, Business Premises, Building Land, Ground-rents, Advowsons, Reversions, Stocks, Shar[illegible], and other Properties will be held at the Auction Mart, Tokenhouse-yard, near the Bank of England, in the City of London, as follows:—

Tuesday, February 13th
Tuesday, February 20th
Tuesday, February 27th
Tuesday, March 6th
Tuesday, March 13th
Tuesday, March 20th
Tuesday, March 27th
Tuesday, April 3rd
Tuesday, April 10th
Tuesday, April 24th
Tuesday, May 1st
Tuesday, May 8th
Tuesday, May 15th
Tuesday, May 22nd
Tuesday, May 29th
Tuesday, June 12th
Tuesday, June 19th
Thursday, June 21th
Tuesday, June 26th
Thursday, June 28th
Tuesday, July 3rd
Thursday, July 5th
Tuesday, July 10th
Thursday, July 12th
Tuesday, July 17th
Thursday, July 19th
Tuesday, July 24th
Thursday, July 26th
Tuesday, July 31st
Tuesday, August 14th
Tuesday, October 9th
Tuesday, October 23rd
Tuesday, October 30th
Tuesday, November 13th
Tuesday, November 20th
Tuesday, December 4th

By arrangement, Auctions can also be held on other days in town or country. Messrs. Debenham, Tewson, Farmer, and Bridgewater undertake Sales and Valuations for Probate and other purposes of Furniture, Pictures, Farming Stock, Timber, &c.

Detailed Lists of Investments, Estates, Sporting Quarters, Residences, Shops, and Business Premises to be Let or Sold by private contract are published on the 1st of each month, and can be obtained of Messrs. DEBENHAM, TEWSON, FARMER, and BRIDGEWATER, Estate Agents, Surveyors, and Valuers, 80, Cheapside, London, E.C. Telephone No. 503, Bank.

SALE DAYS for the Year 1900.

FAREBROTH[illegible] [illegible]LIS, EGERTON, BREACH, G[illegible] [illegible]Y, and CO. beg to announce that the [illegible] [illegible]oned dates have been fixed for their AUC[illegible] [illegible] FREEHOLD, Copyhold, and Leasehold ESTATES, Reversions, Shares, Life Interests, &c., at the AUCTION MART, Tokenhouse-yard, E.C.

Other appointments for intermediate Sales will also be arranged.

Thursday, February 8th
Thursday, February 22nd
Thursday, March 8th
Thursday, March 22nd
Thursday, April 5th
Thursday, April 26th
Thursday, May 10th
Thursday, May 24th
Thursday, June 7th
Thursday, June 21st
Thursday, June 28th
Thursday, July 5th
Thursday, July 12th
Thursday, July 19th
Thursday, July 26th
Thursday, August 2nd
Thursday, August 9th
Thursday, September 27th
Thursday, October 11th
Thursday, October 25th
Thursday, November 8th
Thursday, November 22nd
Thursday, December 6th
Thursday, December 13th

Messrs. FAREBROTHER, ELLIS, and CO. publish in the advertisement columns of "The Times," "Standard," and "Morning Post," every Saturday a list of their forthcoming Sales by Auction. They also issue on the first of every month a schedule of properties to be let or sold, comprising landed and residential estates, farms, freehold and leasehold houses, City offices and warehouses, ground-rents, and investments generally, which will be forwarded free of charge on application.—No. 29, Fleet-street, Temple Bar, and 18, Old Broad-street, E.C.

Notice to Purchasers of Landed and Residential Estates, Town Properties, and Investments.—Messrs.

FAREBROTHER, ELLIS, EGERTON, BREACH, GALSWORTHY, and Co. beg to announce that of the numerous PROPERTIES offered by them to Auction the undermentioned may now be treated for privately:—

CHELSEA, facing the Thames-embankment.—Important Freehold Building Estate of about 20,670 sq. ft. with shops and cottages and two valuable fully-licensed public-houses thereon, the whole producing a rental of £515 per annum, and capable of great and profitable development. In one or three lots.

PINNER.—Important Freehold Building Estate of over 47 acres with residence, occupying a beautiful position within five minutes from the railway station on the Metropolitan Railway.

SUTTON.—About 25 acres of valuable Freehold Land, ripe for immediate building development. To be sold in large or small lots.

BAGSHOT.—Freehold Estate of about 268 acres of heath land, commanding beautiful views, and offering several sites for high-class residences or a charitable institution.

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R.I.B.A. EXAMS. PREPARATION, personally or by correspondence, in three, six, nine, or twelve months' courses. Architectural Lending Library. Special three months' finishing courses.—For full particulars apply to Messrs. HOWGATE and BOND, Associates R.I.B.A., 115, Gower-street, W.C. (close to the British Museum).

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Illustrations sent of Work Executed.
JOHN B. THORP, 98, Gray's Inn-road, W.C.

R.I.B.A., Society of Architects, and Civil Service Technical Examinations. Personal, correspondence, or resident preparation. Seventeen first places.—MIDDLETON and CARDEN, Associates R.I.B.A., 19, Craven-street, W.C.

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The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two.

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PLUMBER'S IMPROVER requires job; used to City Jobbing Shop; wages, subject to arrangements.—G. L., 21, Greenville-street, Victoria Docks, E. 2

QUANTITIES.
H. B. JOHN, P.A.S.I.
TUDOR VILLA, TUNBRIDGE WELLS. 2

CIVIL ENGINEER, experienced in drainage work, building construction, &c., wishes for EMPLOYMENT anywhere in United Kingdom; clerk of works, or any post offering; moderate terms; good testimonials.—Address CHAS. CRAWCOUR, C.E., 29, Argyle-square, King's Cross, London. 2

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Each Additional Line...	0	9

(The Average is Seven Words to a Line.)

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Four Lines or under (about 30 words)	1	6
Each Additional Line (about 10 words)	0	6

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Advertisements of this class must reach the Offices no later than 6 p.m. on Monday.

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Advertisement and Publishing Offices:
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The . . .
Architectural
Review . .

For February, contains

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By F. HOLLYER,

As a Special Supplement, printed on Chromo Art Paper.

Also the following Articles:

SOME SOUTH DEVON PULPITS: By Edward F. Strange: Illustrated.

FOTHERINGHAY CHURCH: Written and Illustrated by Frances J. Erskine.

BRITISH AND DUTCH ARCHITECTURE IN SOUTH AFRICA: Written and Illustrated by Frank L. Emanuel. Part Two.

SOME SURVIVING HANDICRAFTS: Written by Reginald Hallward.

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